



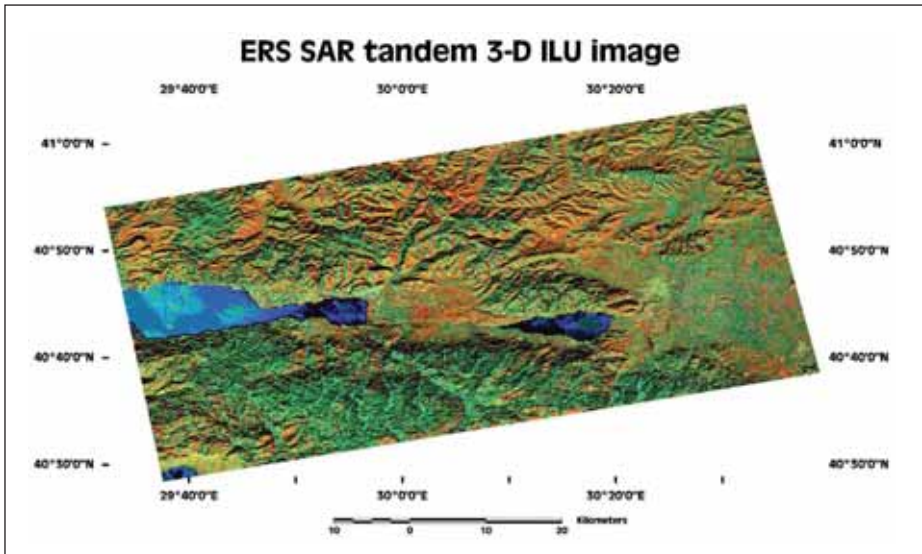
THE MANY FACES OF SDI

OUR EDITOR LOOKS AT THREE DIFFERENT PROJECTS DEALING WITH CREATING SPATIAL DATA INFRASTRUCTURE IN EUROPE

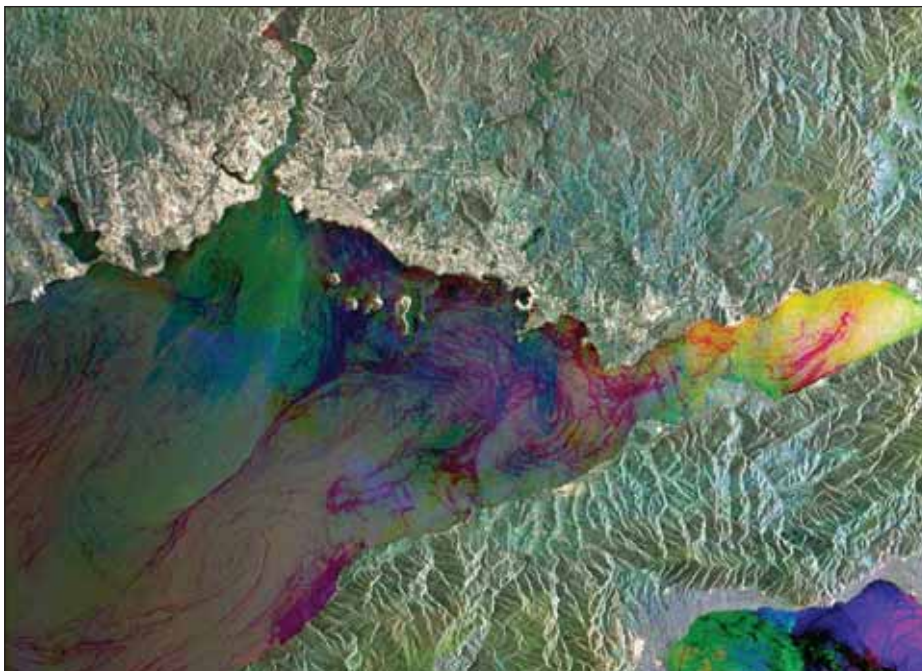
Creating Spatial Data Infrastructure (SDI) involves a combination of many different activities and interests – legal, financial, technical and social – to agree the content and functionality for this type of information infrastructure, involving a wide range of stakeholders. Policy-makers and law-makers, technology providers to help collect, process and disseminate the resulting spatial data, and government staff, businesses and citizens who access and use the new spatially encoded data – all are important players in creating a successful SDI. In this month's issue, our editor looks at three different SDI programmes and initiatives underway at national, pan-European and global levels.

Developing the Turkish National SDI

First, a brief look at the recent launch of a national SDI (NSDI) initiative in Turkey, the second largest country in Europe (by population) and 15th largest economy in the world. On 21 and 22 January, two workshops were conducted in Ankara, Turkey, attended by over 160 government officials from Cabinet level, Directors General of major government departments and officially appointed 'Points of Contact' in scores of Departments. The workshops were conducted by the Turkish National Satellite Corporation (Turksat), TurksatGlobe Division, which is charged with conducting the 6-month feasibility study focusing on strategy, policy and legal requirements, technical requirements, standards issues, business plan, organisational model(s) and draft implementation plan for creating the NSDI. This study will also produce an invitation to tender (ITT) for the follow-on work that will be required to complete the implementation of



An SDI must incorporate and integrate information from multiple sources. This image shows the area of Turkey affected by the earthquake of 17 August 1999. It was generated from an ERS-SAR tandem pair acquired on the 12 and 13 August 1999 - 4-5 days before the earthquake. Source: ESA



The city of Istanbul shown in an Envisat radar image. Source: ESA

NSDI over the coming years.

In a break from the practice seen in most of western Europe and other parts of the world, in which a central government department typically takes the SDI lead, or is given the responsibility for overseeing creation of the national SDI, Turksat is a private firm, though wholly government-owned - operator of Turkey's communication satellite system and distributor of satellite-based remote sensing data (via an on-line portal) from DigitalGlobe, among other suppliers. The company's ICT Division also has the mandate to coordinate implementation of Turkey's e-Government programme, under which more than 110 projects are now being developed as part of the Turkish government's Information Society plans. The Turkish NSDI programme falls under this e-Government umbrella, indicating that the resulting SDI

should be tightly coupled to the other aspects of e-Government, and to creation, use and distribution of public sector information (PSI) at the heart of that larger initiative and the basis for much of the information that underpins the Information Society.

The Turkish government intends to learn from current 'best practice' from around Europe and the globe in creating its NSDI. Working alongside the TurksatGlobe project team are a group of external SDI experts, experienced in the policy, legal, organisational and technical requirements and challenges faced in creating a successful SDI. These experts are already involved in implementing SDIs at national and regional level in Europe and have worked in other jurisdictions, as well. A considerable amount of time and effort, over the past eight years, have gone into defining the vision, strategy, legal

framework, cooperation and coordination infrastructure, and implementation path for the pan-European SDI INSPIRE (Infrastructure for Spatial Information in Europe) via the legally binding EU Directive of 2007. The Turkish NSDI initiative embraces this work and plans to learn from the most positive aspects of INSPIRE and the more successful European SDIs still under development. This is to avoid mistakes or lost opportunities made in the past in these other initiatives, so that the Turkish SDI can be created as quickly, efficiently and successfully as possible.

By also ensuring that their own NSDI is as compatible as possible with INSPIRE's technical requirements for harmonisation and interoperability of datasets and services, Turkey will also be able to cooperate with EU Member States on intra-European projects that require or use geospatial data, in areas such as environmental monitoring, climate change, natural disaster management, air quality and transport planning – activities that often have important trans-boundary, trans-national elements.

Developments in INSPIRE, the pan-European SDI

The INSPIRE Directive (Infrastructure for Spatial Information in Europe) was published in April 2007 and was to be adopted into national law by all EU Member States by 15 May 2009. While many States have yet to adopt the enacting legislation in their countries, all are in the process of implementing national SDIs, which must now take account of the specific implementation rules dictated by INSPIRE. These rules are being promulgated as a series of EC Regulations and/or Decisions covering metadata creation and publishing, data and services interoperability, access and sharing principles, and monitoring and reporting requirements. All Member States have one government department appointed as being officially responsible for coordinating implementation of INSPIRE in their countries and acting as the official interface to the European Commission during the implementation period and for later monitoring and reporting activities.

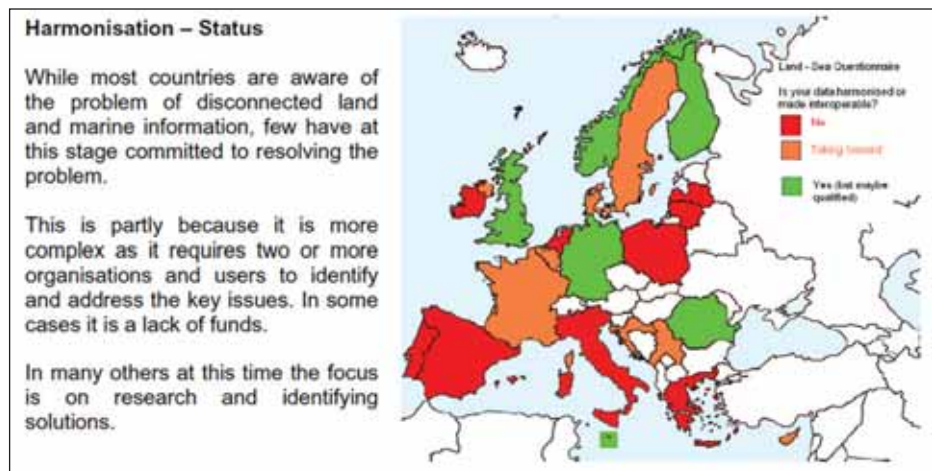
Looking at the current status of NSDI implementation across Europe, and the degree to which these programmes are able to claim compliance with the Directive reveals a very uneven situation. Some states have yet to even officially adopt a formal SDI strategy, others accomplished significant work towards achieving a state-wide SDI. However, further investigation also reveals that much work remains to be done for NSDIs to permeate to all the levels of society required by the Directive – between governments and EU institutions, between government departments across national borders, among government departments at all levels of government within a State's own borders – and to citizens. Especially problematic has



Western Turkey as seen in a Medium Resolution Imaging Spectrometer (MERIS) image. Acquired on 30 October 2002 in full resolution mode (300 - metre resolution). Source: ESA]



Creating a trans-national SDI, as INSPIRE is attempting to do, requires significant preparatory work, including literally hundreds of meetings of experts. The European Commission has funded dozens of projects through various RTD and information market programmes to aid in this work. Depicted here are experts at an ESDIN (European SDI Best Practice Network) Project meeting in February 2010, a project funded under the eContent+ programme. Source: ESDIN Project



EuroSDR has also been investigating the extent to which land and marine/coastal data are integrated across Europe. Much remains to be done. A new Interregional Development project – BLAST (Bringing Land and Sea Together) – is now working on this for North Sea states. Source: EuroSDR Project report.

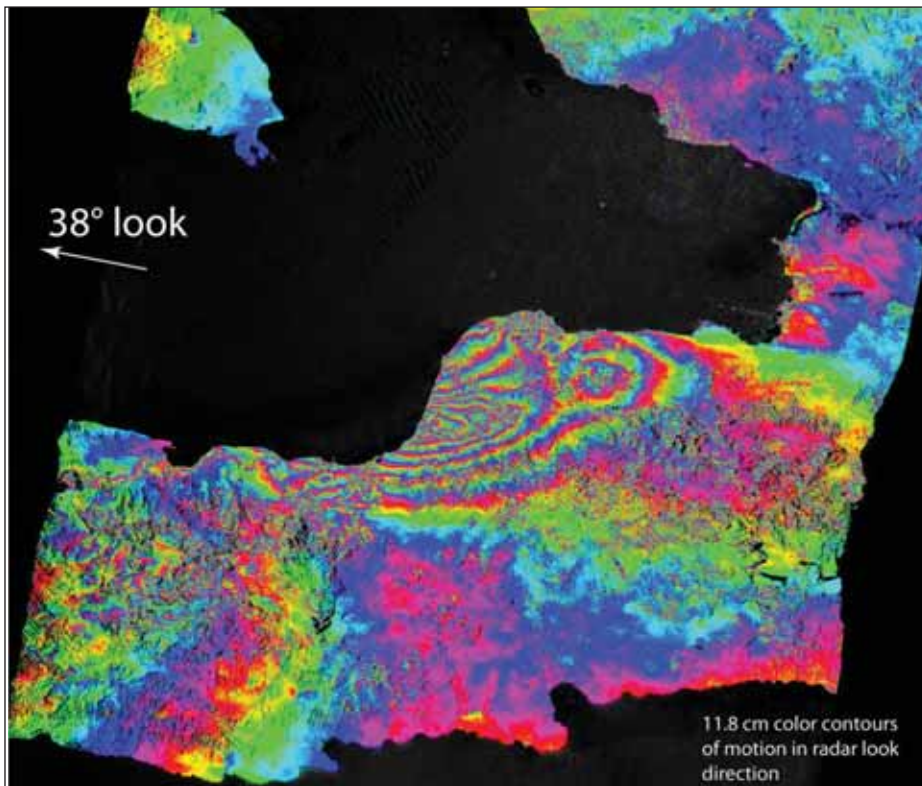
been achieving the extension of the SDI – and its benefits – to the lower levels of government and to citizens generally. The degree to which the private sector has been involved, or benefits from the different SDIs, is also quite variable across the 27 EU Member States.

The EuroSDR organisation is in the final months of a two-year project compiling evidence of ‘best practice’ in implementing INSPIRE across the Member States. The main output from this project will be the “Atlas of INSPIRE Implementation Methods”, to be published as a publicly available on-line wiki before the end of 2010. A pilot version could appear as early as June this year.

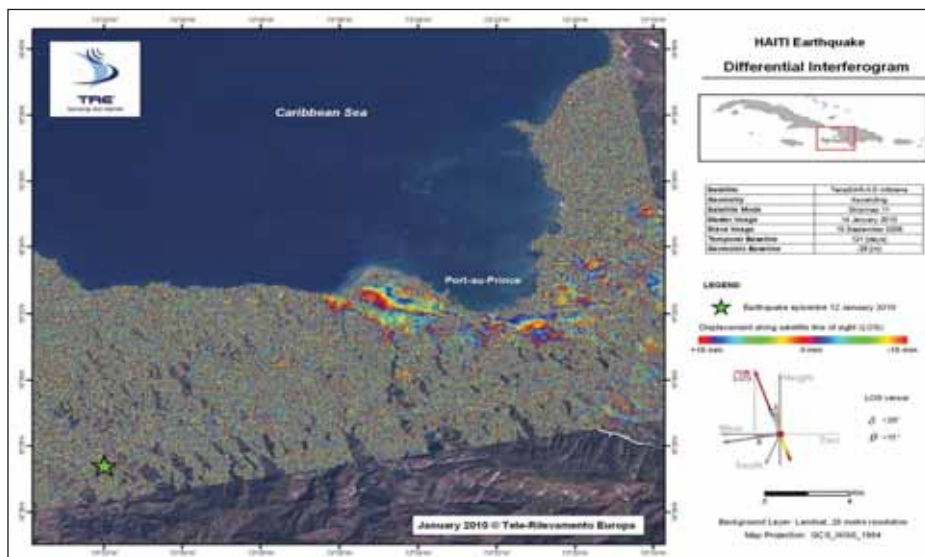
On 14-15 January, the project sponsored a workshop at the Club Prince Albert in Brussels, hosted by IGN, the national mapping agency of Belgium, who are also directly involved in the project. The 22 participants represented 10 EU Member States now embarked on implementing national SDIs and INSPIRE. Also present were representatives from two of the commercial companies developing some of the interoperability technology needed, and a representative from the INSPIRE implementation team at the European Commission. Finally, several staff from Belgian and Dutch research centres who have been involved in monitoring and studying various aspects of SDI implementation and impact for a number of years, at both national and pan-European levels, presented their findings to date, based on analysis of questionnaires circulated earlier to the Member State representatives responsible for INSPIRE in their respective counties.

Information presented at the Brussels workshop indicated that even where NSDI implementation is at a more advanced state than in many EU States, there is still cause for concern about the degree to which the SDI has penetrated to lower levels of government or benefited citizens directly. An important message is that SDI is information infrastructure, not simply a large national GIS system or a collection of geoportals. Infrastructure is not created overnight – or even in just the few years that some of the more advanced initiatives have been active. Many EU States still have quite a long way to go.

Another important activity of the EuroSDR workshop was a brainstorming session to identify the range of issues that still require research and investigation. The participants came up with more than 50 issues or topics where more or better information is needed. The project is analysing these and preparing a recommendation for the European Commission to include a concerted action line in the EU’s 7th Framework RTD Programme (FP7) future work programmes (2011-2013). This research would run in parallel with on-going implementation of the Directive across the Member States, providing valuable input – and guidance on best practice solutions- to the practical challenges



PALSAR interferogram of Haiti from the NASDA (Japan) Advanced Land Observation Satellite (ALOS) PALSAR (SAR) sensor, Path 447D 09/03/2009 to 25/01/2010, as analyzed by JPL/NASA, data © JAXA.



A differential interferogram of the Haitian earthquake produced on 14 January 2010, shown on base line data from 15 September 2009. Source: Tele-Rilevamento Europa.

faced by the governments in implementing the Directive.

Regional to Global SDI – GEOSS, GMES and INSPIRE

January also saw a two-day Stakeholders Workshop of the FP7 GIGAS Project – an Action in Support to GEOSS, INSPIRE and GMES, which began in June 2008 and ends in May 2010. INSPIRE has been explained above, and is the first step towards a regional (transnational) pan-European SDI. GMES is the Global Monitoring for Environment and Security programme of the European Commission and European Space Agency, one of the first – and few! – programmes in

which both these European institutions cooperate. GEOSS is the Global Earth Observation System of Systems, a global initiative of mainly voluntary actions leading to greater interoperability of Earth Observation (EO) data and services amongst all nations for a number of important shared activities, such as major disaster monitoring, mitigation and management, environmental and climate change monitoring, etc.

The ultimate goal of programmes such as GEOSS and GMES is to permit rapid access to earth observation data for a range of purposes, from multiple sources, especially in times of natural disasters such as the 2004 Indian Ocean earthquake and resulting tsunami or

the January 2010 Haitian earthquake which has crippled the entire country. The images here are a tiny sample of the hundreds of analyses of different aspects of the Haitian earthquake, from prior stress conditions to post-event follow-up, resulting from access to EO data and imagery from numerous sources. To see the wide variety and scope of analyses performed, visit the UNAVCO GEO web site at <http://supersites.unavco.org/haiti.php>.

Because the three initiatives share many of the same stakeholders, but at different geographic 'scales' – national, regional to global – GIGAS is attempting to promote coherent and interoperable development of the initiatives through concerted action on adoption of common standards, protocols and open architectures. The main aim is to assess and address interoperability gaps and opportunities for establishing bridges between the initiatives based on a consensus-driven approach. The project is attempting to meet this aim via the GIGAS Forum – relevant stakeholders from across the three initiatives, including national SDI implementers; national, regional and global remote sensing organisations; standards bodies such as ISO, CEN (the European Standards Organisation) and the Open Geospatial Consortium, Inc. (OGC), and national and regional government representatives.

The project adopted a consensus-driven approach to identifying the main challenges thwarting wider interoperability of the EO data and services that each initiative is providing, based on monitoring the initiatives' activities and related EO/SDI projects; identifying gaps and overlaps, then proposing possible synergies and solutions; achieving consensus on these recommendations via broad consultation, then offering suggestions on how the three initiatives could be re-shaped in order to achieve greater interoperability, e.g. by standardization actions, more applied research, etc.

The main goals of the Forum are to facilitate communication among the registered members to reach consensus on the recommendations and to foster closer working relationships between the geospatial data standards bodies at national, regional and global levels.

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