

GeoXperience

di Planetek Italia

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Planetek 2020

The new Operational model

How we take care of our Environment

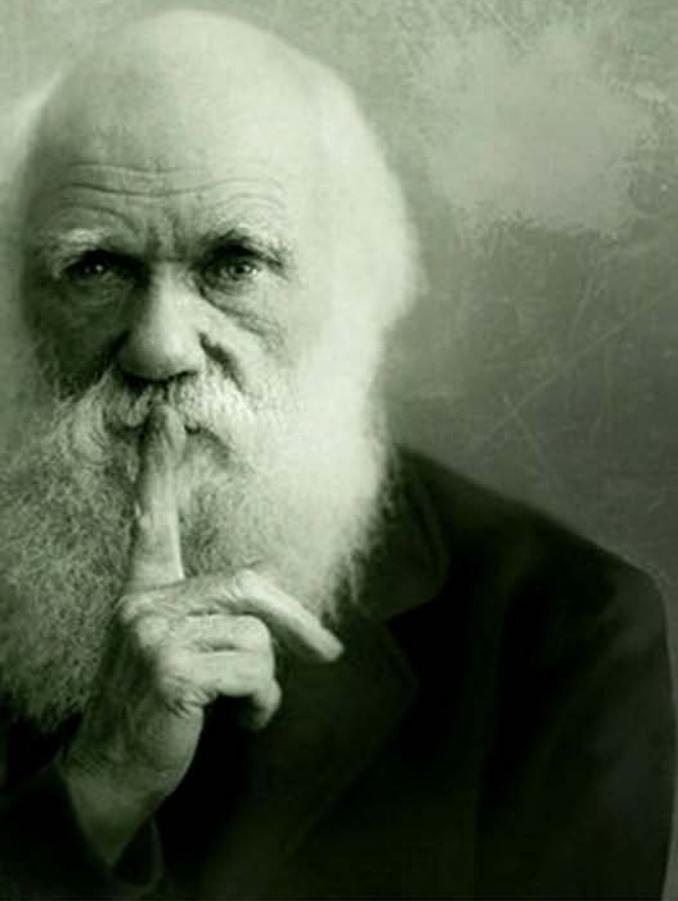
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Space: Planetek's new frontier



It is not the strongest of the species that survives,
nor the most intelligent, but the one most responsive
to change.

Charles Darwin

PLANETEK
ITALIA

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Planetek Italia s.r.l.

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Planetek Italia has always tried to define its strategies with the aim of meeting the new needs of users.

Back in the early 2000s, we tried to formalize our approach to innovation in cooperation with our users. You may remember our slogan: "We don't look at reality through the distorting lenses of technology, but we interpret the real needs and pursue sustainable developments". In 2007, we started our first projects with the application of the Strategic Design, which aims to identify the dynamic intersection between the Users' Needs, Technological Skills, and Economic Sustainability.

In those years, we were already aware of the need to face a world that had been changed deeply - by technology, but also by new social behaviours - while experiencing a very serious economic/financial crisis that we immediately saw as a structural one.

These processes leads us to consider the need to start a radical change that allows us to get Planetek Italia in line with a new world. However, such a project cannot be implemented without taking into consideration the global megatrends: surely, the new knowledge distribution processes have interconnected the various subjects much more than in the past, and also during the change it is necessary to have a compass to ensure the compatibility of our choices with those of our stakeholders.

For a Europe-inspired company like Planetek Italia, the decision of making our change consistent with the European innovation programmes is therefore a forced choice, as well as a great idea. The European programme Horizon 2020 provides us with a reference framework and a benchmark for the assessment of our change and innovation strategies. The strengths of the EU 2020 strategy are the following:

- Strengthening the European scientific basis by improving the results of basic research, promoting the development of new technologies, encouraging international exchanges and the development of human capital;
- Boosting the competitiveness and leadership of European industries by promoting the use of new technologies, improving the access to risk capital, supporting the innovation of SMEs;
- Increasing the contribution of research and innovation to the solution of impending social challenges;
- Providing a final users' needs-based support to the scientific and technological research policies of the Union;
- Improving the integration of the knowledge triangle between: research, researchers' training (University) and innovation.

In this framework, Planetek 2020 starts a path of modernization and change, in line with the choices of the past - e.g. Planetek Estesa - the investments in research and development and internationalization, the efforts made to establish strong connections with the Universities and Research Centres through the spin-offs GEO-K and GAP, which will gain a new value and a better focusing of their goals.

Once the strategic framework of the initiative is defined, it is important to explain the "how", i.e. what should be actually changed about Planetek Italia to make it more effective in (re)interpreting this scenario, and the "what", i.e. what we expect Planetek Italia to be at the end of this process.

Why should a company make changes? Because creating a new reality means creating a boat that uses tradition and exploits innovation. Thus, exploiting everything that works, we sail to look for new scenarios, new markets and new products that allow the company to grow - rather than just stay

afloat - thanks to a renewed thrust and to steer towards the uncertainty of the future.

Although 8 years look like a short lapse of time, they actually are a very long period in the field of technologies. Therefore, our 2020 strategy includes 3 phases.

The first phase, Planetek 2020.1, aims to align our organizational model to the implementation of a Users-oriented Planetek Italia. Hence the decision of getting

over the organization based on production-related vertical technologies and the separation between production and sales, with the definition of the SBUs, Strategic Business Units, responding to the market's needs.

This may meet our need to improve our relationship with the Markets where we operate, or where we aim to operate; however, it does not meet our need to look for new markets and new products that are suitable for emerging markets.

Thus, the new organization of Planetek Italia includes a dedicated place, the "Design Lab". It will be in charge of exploring new territories where Planetek Italia will expand its business in the future, turning the visions deriving from the above mentioned innovation context into market opportunities.

What will Planetek Italia be at the end of this process?

In our intentions, a subject with a codified ability to adapt and a consolidated management of change; In actual facts, it will be an industrial species much more likely to evolve and therefore survive the social, economic and technological changes that we will face over the years.

Quoting Luis Sullivan, "form ever follows function", and Planetek Italia complies with this law.

*"It is the pervading law
of all things organic and inorganic,
Of all things physical and metaphysical,
Of all things human
and all things super-human,
Of all true manifestations of the head,
Of the heart, of the soul,
That the life is recognizable
in its expression,
That form ever follows function.
This is the law"*

(Luis Sullivan, Architetto, 1986)



An evolving organization

The market and technologies are changing. In order to be closer to our clients, we have created four *Strategic Business Units* in Planetek Italia

The world is changing, as well as technologies, markets, competitors, and social, ethic and environmental conditions. Crises follow one another and raise the competitiveness level. Globalization leads us to internationalization and to operate in markets where competition is very selective and only the companies that are able to create value can survive.

“It is not the strongest of the species that survives, nor the most intelligent, but the one most responsive to change”.

(Charles Darwin).

Thus, in order to be competitive, it is necessary to be able to change and quickly adapt to this continuous dynamism. In order to address this dynamism, we have adopted **Strategic Design** (*Design Thinking*) as our operating model for several years, aiming to identify the best combination, over time, of the following elements: user, technological feasibility and economic, social, and environmental sustainability.

This model includes the continuous development of prototypes and the gradual revision of the requirements that allows us to develop our solution on the basis of the actual needs of our clients. Needs that continuously evolve during the design phases, also thanks to our continuous interaction.

Technologies change, but we believe they are a means and not an aim. Therefore, we only adopt those technologies that allow us to achieve the targets we have agreed with our clients in the best possible way, assuming that technology should create value and make the users' life easier.

However, technology is an integral part of ourselves, thus we invest significant amounts in research and innovation to anticipate its changes. Therefore, we have decided to start our Design Lab, a place for identifying new solutions derived from the optimal mixture of technologies and processes. Our Design Lab defines the specifications of innovative products and services, up to the implementation of prototypes and pilot projects aimed at both consolidated and new markets. In or-

der to perform its tasks, the **Design Lab** also makes use of the two university spin-offs we have helped found: Geo-k and GAP.

The **market changes** and so do our clients, also because of our growth. In order to better face these changes, we have decided to adopt a new organizational model that gets over the organization based on technologies and the separation between commercial and production functions, through the creation of our SBUs, Strategic Business Units.

Thus, we have now four Strategic Business Units in Planetek Italia: **SBU Space Systems**, which develops and integrates hardware and software infrastructures for the acquisition, treatment and distribution of remote-collected data on the market of international Space Agencies and the main operators of the aerospace market; **SBU European Institutions**, which offers geospace solutions to the European Institutions and Agencies in the framework, for example, of the GMES programme and INSPIRE initiatives; **SBU Business 2 Business**, which offers the competence of Planetek Italia in the field of energy and transports to the commercial companies and private market; **SBU Government & Security**, dedicated to Italian and international Public Administration in charge of the Defence market.

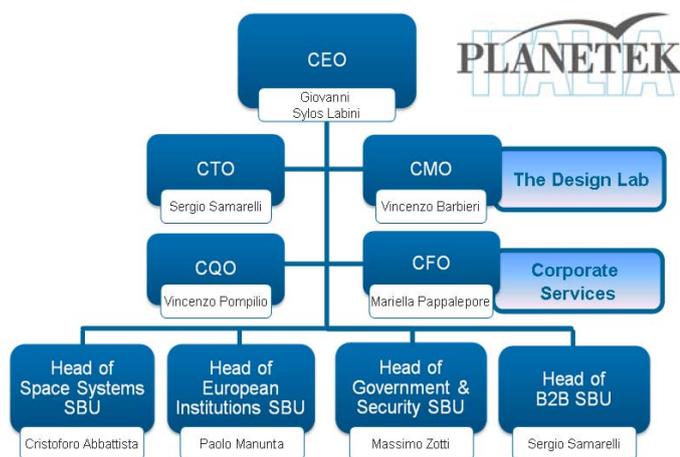
Our SBUs have all the skills they need to operate fully autonomously, from the design and commercial skills to the production skills. This way our clients know that when they turn to us, they will always have only one contact person that is fully in control and responsible for the project and the targets to achieve, through every phase.

These Units are called Business Units as they are segmented according to market. This feature allows to better understand the needs of our clients and ensure continuity over time. They are called Strategic as each Unit is able to autonomously define their technical and commercial development plans in

order to operate in the assigned business areas in the best possible way.

Our whole organizational model was therefore adapted in order to better comply with the ongoing changes. Four Corporate functions operating as support to the whole company have been defined to help the CEO - Chief Executive Officer: CMO - Chief Marketing Officer; CTO - Chief Technology Officer; CQO - Chief Quality Officer; CFO - Chief Financial Officer.

Thus, over these years, we have implemented a continuous evolutionary process that led us to revise our organization as a whole, making the change not only as a necessity to continue operating but also as a tool for continuous improvement.



ASK THEM

Need more information? Feel free to contact the persons in charge of the Strategic Business Units in Planetek Italia.



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THE STRATEGIC BUSINESS UNITS

Each SBU (Strategic Business Unit) is a company structure oriented to a specific market segment.

European Institutions

The European Institutions SBU designs and provides geospatial solutions for European institutions and agencies such as the European Environment Agency, the European Union Satellite Centre, European Defence Agency, the European Union (EC, REA, JRC), European Space Agency (services for Earth Observation, geospatial data infrastructures, user segment, embedded applications) and the Italian Space Agency (Earth Observation). The European Institutions SBU mainly operates in the development and integration of Earth Observation data processing chains designed for the supply and distribution of user solutions derived from optical and radar data, as well as for the integration of these data in a fully operating SDI. It also has expertise in developing large-scale SDI for managing multi-source data and user segment elements.

Business 2 Business

The B2B SBU provides geospatial solutions for private commercial and engineering companies operating in national and International markets of energy, transport (railways, roads), construction and agriculture. The B2B SBU solutions portfolio ranges from business geo-intelligence systems to geo-information value-added products derived from Earth Observation data.

Government & Security

The Government & Security SBU provides a wide range of application solutions and services mainly for the markets of national and international Public Administration, Italian defence agencies, Italian educational and scientific research organizations. The offered solutions are the result of a mix of technologies in the fields of Earth Observation, Spatial Data Infrastructure and territorial and environmental applications designed and customized for urban planning, civil protection and emergency response, tourism, coastal monitoring and protection of water resources, agriculture and forestry. The technologies range from Earth Observation data (satellite, airborne or uav-based) to Free Open Source or proprietary software platforms, or to leading commercial products (e.g. Intergraph | ERDAS), and Planetek's proprietary product lines Preciso® and Cart@net®.

Space Systems

The Space Systems SBU market includes the Italian and European Space Agency, the European Commission and the major National and International players in the aerospace sector. The Space Systems SBU develops and integrates hardware and software infrastructure for the acquisition, processing and distribution of satellite data, along the entire chain of production: from Deep Space to Earth Observation, from the Space Segment, to the Ground Segment and the User Segment. The Space SBU main competences are the Systems and Software Engineering and the user oriented Space Mission Analysis and Design (SMAD).



Planetek Italia Group, environmental sustainability and social responsibility

Planetek Italia group has always believed in a strong commitment towards environmental sustainability and social responsibility

Each company, whatever business is involved in, must interact for its activity with a number of groups of interest, commonly called stakeholders, such as governments, regulators, customers, competitors, community and environmental interest groups, and industry associations. The big difference is how do managers consider them: an obstacle or a resource for its business. Here following we'd like to present our great resources.

The Planetek Italia group

Planetek Italia is truly concerned in sustaining a strategy of network knowledge and extended management of its manufacturing processes, where specialised skills and competencies can increase in value. A strategy that conjugates higher specialisation, from Earth Observation to Geographic Information Systems, and innovative or more efficient integration among systems and technologies.



Planetek Hellas EPE is located in Athens, Greece.

Starting from the experience and assets of the group leader, the Greek market approach of Planetek Hellas is lead towards the development of systems and applied solution that benefits of the know-how gained in relevant european programmes in the field of Aerospace Research, system integration, and in the management, analysis and sharing technologies applied to land information. (www.planetek.gr)



GEO-K S.r.l. is the first Spin-off company of the University of Roma Tor Vergata. The Mission of GEO-K

is to work in the research and development and provide consultancy, services and products in the field of image processing and Remote Sensing (optical, hyperspectral and microwaves). GEO-K can advantage from its highly specialised human resources with a large international experience in European Union and European Space Agency's project. The solution developed are provided both to private and public customers with the help of market sensitivity of Planetek Italia. (<http://www.geok.it>)



GAP S.r.l. is a Spin-off company of Politecnico di Bari whose mission is to develop products, processes and services with technological and scientific value in the field of remote sensing and related software/hardware technologies, with a focus on geomatic solutions and applications.

All the activity is performed on the basis of competencies and pay-offs of research projects, particularly in the remote sensing group of Dipartimento InterAteneo di Fisica. The specialised competencies of GAP are on satellite remote sensing:

- Earth surface millimetric movements detection through the interferometric analysis of Synthetic Aperture Radar (SAR) data;
- Water quality estimation through passive sensor working in optical radiation.

(<http://www.gapsrl.eu>)

Quality, Environment and Social responsibility

We believe that Planetek Italia must play a role in society and therefore we integrate corporate citizenship and social responsibility into every aspect of our company.

So we wanted to certify our commitment to provide an example to those who believe in our values. We believe that teaching by example is the way to change society.

Quality Management System: ISO9001

Planetek Italia has adopted a "company system" instead of a "quality system" to manage each activity in accordance with precise inner rules, with their consequent translation in informatic procedures.

According to Planetek Italia, Quality is a philosophy, a way to operate which includes all the activities of the company and becomes a clear definition of customer's requirements, that is a "project" approach to the orders, for a subdivision of the activities into "work

packages" defining responsible, output, input, work times and verifications. Such a methodological way of work allows the planning of the activities, the respect of the times and specific of the systems realized.

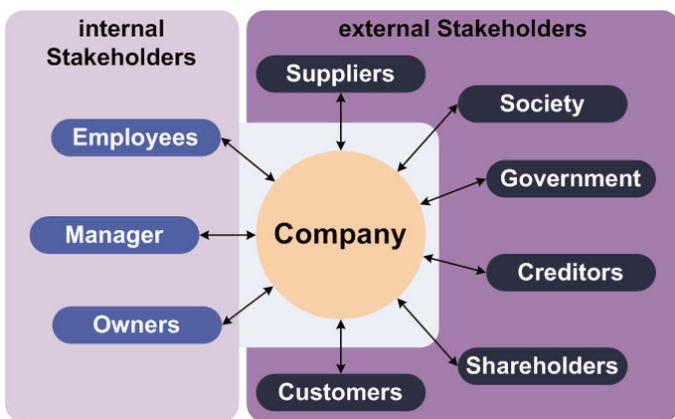
The organization of the company system in conformance with the ISO normative, has led Planetek Italia to pass the check on January 14th 2000, and to receive the certification. Planetek Italia is certified in compliance with ISO 9001 standards (n. IT09/0272) with the scope: "Design, realization and servicing of geographical information system (G.I.S.), cartographical and Earth Observation data processing (E.O.). Design and delivery of training services regarding geographical information system and Earth Observation."

Environment Management System: ISO14001 & EMAS III

Planetek Italia is truly concerned in considering environment as a part of its production and business and operates in respect of Italian and European environment laws and directives. Planetek Italia is certified in compliance with ISO 14001 standards (n. IT07/1605) and Reg. CE 1221/2009 (EMAS III)(n.IT-001246).
www.planetek.it/environmental_policy_ENG

Social Responsibility System: SA8000

Planetek Italia has always naturally considered human rights fundamental. The road to SA8000 certification is just a written commitment, stating what the company has always believed. In this path we have stated our Social Responsibility Politycy that we are pleased to share with our clients, partners, suppliers and stakeholders in general. Planetek Italia is certified in compliance with SA8000 standards (n. IT09/0213).
www.planetek.it/corporate_social_responsibility_ENG



ASK THEM

Feel free to contact the persons in charge of the company organization, marketing and environmental & quality assurance.



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Industrial relationships and involvement

Planetek Italia permanently maintains relationships with its industrial stakeholders, promoting a stable collaboration, participating in initiatives and sharing its knowledge and expertise, to foster an overall progress of the industrial system. Here following the groups and organizations with Planetek Italia is involved in.

Open Geospatial Consortium (OGC)

OGC Associate Member
www.opengeospatial.org/ogc/members



European INSPIRE Directive

INSPIRE SDIC (Spatial Data Interest Communities).
http://inspire.jrc.ec.europa.eu/index.cfm/pageid/181
Founder of the Italian INSPIRE FORUM.
http://inspire-forum.jrc.ec.europa.eu



EARSC

Member of the European Association of Remote Sensing Companies.
www.earsc.org



AIPAS

Founder member of the Italian Space SMEs Association.
www.aipas.it



AIT

Member of the Italian Remote Sensing Association.
www.aitonline.org



AMFM-GIS

Member of the Automated Mapping, Facilities Management, Geographic Information Systems (GITA association).
www.amfm.it



CONFINDUSTRIA BARI-BAT

Member of Confindustria, the main organisation representing Italian manufacturing and services companies.
www.confindustria.babt.it



Apulian Aerospace District

Member of the Apulian Aerospace large, medium & small enterprises.
www.apulianaerospace.eu



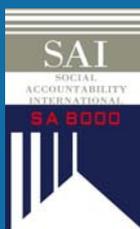
Distretto Produttivo dell'Informatica

Member of the Apulian Information Technology District.
www.distrettoinformatica.it

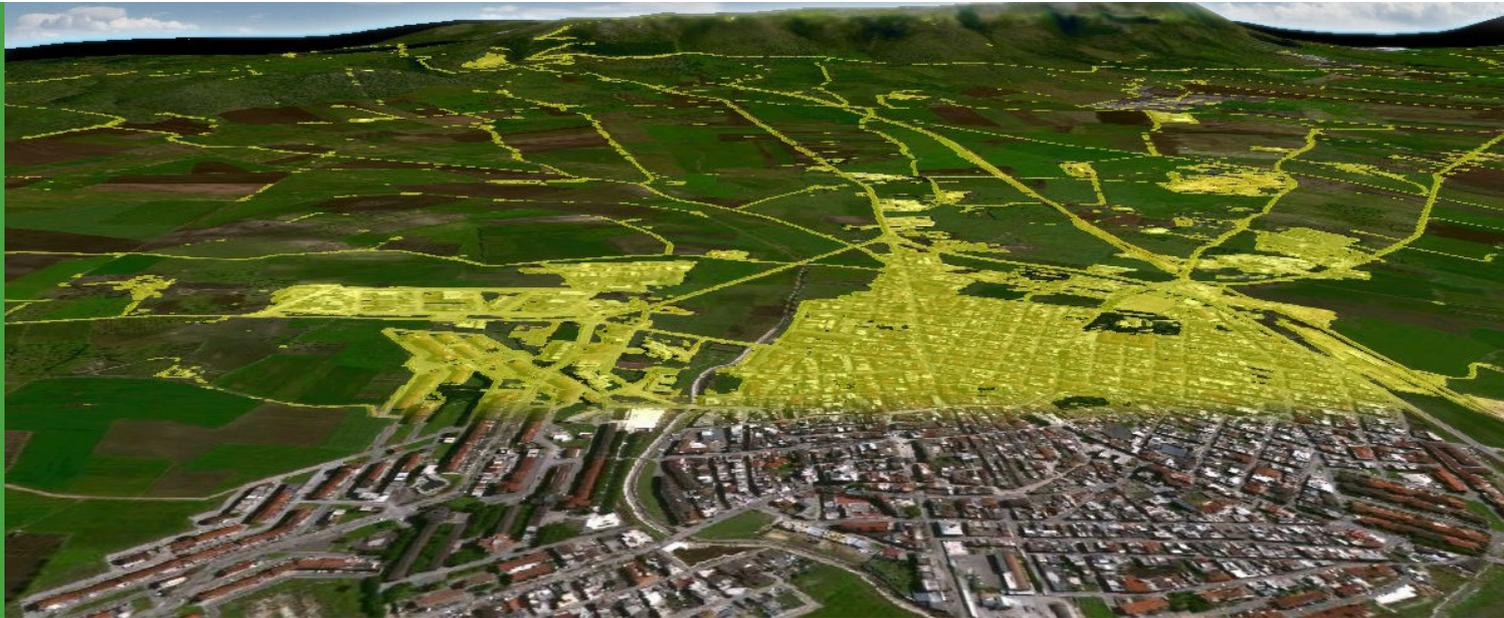


Costellazione Apulia

Member of the Apulian consortium Costellazione Apulia.
www.costellazioneapulia.net



International
Organization
Standards



Sealed areas according to GMES

Urbanization is the main cause of soil sealing and land consumption processes. Earth observation can help monitoring these processes.

Since 2006, in the framework of the programme GMES Fast Track Service on Land Monitoring, the European Environment Agency (EEA) has commissioned an international consortium of companies the study and the production of Sealed Area Map of the 32 EEA member countries, plus 6 Western Balkan countries (Albania, Bosnia-Herzegovina, Croatia, Macedonia, Montenegro and Serbia). The map was updated in 2009 and now the GMES Land Monitoring Service has entered its Initial Operations (GIO) in which it is planned to update the Sealed Area Map to year 2012 (with the addition of Kosovo according to the United Nations Security Council Resolution 1244/99) for a total amount of about 6 million square kilometers of coverage.

Strategic discussions between the Member States, the European Parliament and the main EU institutions responsible for environmental policies, reporting and evaluation (DG ENV, EEA, ESTAT, JRC) have emphasized that the growing need for a real and quantitative information about the state of the environment, which is obtained through timely and quality guaranteed data provision, in particular as regards the coverage and the land use.

As established in the Regulation (EU) No. 911/2010 of the European Parliament, from the Council of 22 September 2010 on GMES, the European Earth monitoring program - and its Initial Operations (2011-2013) -, and from the Agreement signed between the European Commission (EC) and the European Environmental Agency (EEA), the technical coordination of the implementation of a pan-European land monitoring services of GMES Initial Operations is delegated to EEA.

For the implementation of these pan-European land monitoring services, has been planned the the CLC (Corine Land Cover) update and the production of five high resolution information layers (HRLs, High Resolution Layers) for the reference year 2012 , in order to provide a series of low-cost ser-

vices at European level, based on high-resolution multi-temporal and orthorectified satellite data. This information on land cover, will respond to a wide request for environmental information in different areas at the European level and, if possible, even at national and regional level.

The 5 high-resolution layers will be extracted both from IR-SP6/Resourcesat and RapidEye multispectral satellite data, resampled to 20 meter resolution, and from medium-resolution AWiFS satellite data, resampled to 60 meters, using semi-automatic classification techniques.

The production of the 5 high resolution layers is organized in two steps. The first step is performed by six international teams which will produce the products and, subsequently, in the second step, EEA member countries that have expressed their interest in participating in some phases of the production process will be involved. The member countries will participate in the validation process and thematic detail increasing of the products. The EEA will then make a statistical analysis to determine the accuracy of the results by using an independent measure, which will use as a reference of truth high-resolution data (eg. Aerial, LUCAS data, other satellite data, thematic maps, etc.).

One of the 5 layers is the **Sealed Area map**. The sealed areas derive from the replacement of the original and natural soil cover with an artificial covering, which generally determines a high degree of irreversible sealing.

The first version of this level of information was produced in 2006 as part of the GMES Fast Track Service on Land Monitoring, then it was updated in 2009 with the Geoland-2 project and is currently being updated as part of the GMES Land Monitoring Service, which entered in its Initial Operations (GIO).

The production of an updated high resolution Sealed Area Map, also includes the updating of the soil sealing degree - on

a scale that goes 0 to 100% - and the estimation of the change in this level - always on a scale from 0 to 100% -, through an automatic processing based on the NDVI vegetation index.

The production began in 2006 and has been carried out on the entire territory of the 32 member countries of the EEA plus 6 Western Balkan countries (Albania, Bosnia-



Herzegovina, Croatia, Macedonia, Montenegro and Serbia). With the upgrade to 2012 the territory of Kosovo (behind the Resolution of the Security Council The United Nations 1244-/99) has been added to the map, for a total of about 6 million square kilometers of coverage. The entire upgrade process is based on the experience gained in the production carried out in 2006 and 2009 with a final target of at least 85% accuracy.

Planetek Italia has contributed to the creation of impervious land cover in both 2006 and in 2009 and currently is involved in the 2012 update.

The implementation of these activities has allowed us to develop a depth of experience in the methods of mapping the impervious areas that have been used to develop the methods of processing of high-resolution satellite data also at local scale. This information level is the base of the **Index of Soil Loss** that is a hallmark of our geo-informative product **Preciso® Land** (see description at page 22-23).

ASK THEM

Need more information? Feel free to contact our GMEs experts of the European Institutions SBU.



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PLANETEK ITALIA IN THE GMES

For each of the five main areas of application defined in the GMEs project was launched the *Core* projects. Planetek Italia and its group companies, which have a long experience in projects of the GMEs program, are also involved with a leadership role in some *Core* projects and in the implementation of some *Downstream* services, that aim to provide application solutions to local authorities .



Within the Core Services projects, Planetek Italia group is active in:

- **Geoland 2:** The project goal is to develop and demonstrate a range of European reliable and cheap geo-information service line, to support to the implementation of European Directives and National policies. Planetek Italia team participates in the Urban Atlas production through the development of a protocol for updating the maps and testing activities of some European cities. It is also involved in the research and testing of the artificial areas layer and agricultural areas (grassland) layer, within the working group dedicated to five high resolution layers.
- **SAFER (Services and Applications for Emergency Response):** This project provides a service to respond to emergencies through thematic products, specifically developed for civil protection and the humanitarian community. Planetek Hellas is responsible for the management of GeoRSS and visualization of special maps of its external feeds.
- **GMosaic (GMEs services for Management of Operations, Situation Awareness and Intelligence for regional Crises):** The project provides intelligence services to the EU and its Member States before, during and after crisis situations. Planetek Italia worked to maps for classification and change detection for the service of "Planning for crises", as well as to the design and development of an infrastructure component for managing the information of the operators and secure access to geographic data.
- **Marine: MARCOAST project** (see page 12-13)
- **Atmosphere: OZONE 3D project** – Thematic maps of the Ozone distribution. SSE Ozone 3D is a service designed to provide thematic maps of the Ozone distribution at the different layers of the atmosphere, through an inversion scheme based on neural networks and available in the European Space Agency's (ESA) Service Support Environment webportal.

<http://www.planetek.it/eng/projects>





Urban Heat Islands and urban thermography

The thermal remote sensing technologies, integrated with models of urban micro-meteorology, allow to identify Urban Heat Islands

Increasing of sealed areas which greatly exceed the green ones, exhausts from car's engines, industrial plants, air conditioning systems: all those elements, interacting among them, contribute to a larger heat storage into the urban areas.

The most disastrous consequences of such effect are the heat waves that periodically strike our cities during summer, increasing the risk level for the health and safety of citizens.

Earth Observation data together with climatological models can give an important contribute for the study of the thermal properties of the cities.

The integration of the thermal remote sensing observations and ground-based measurement from meteo stations with urban atmosphere models is indeed useful for supporting the prevention and mitigation of the consequences of heat waves and for studying the **Urban Heat Island (UHI)** phenomenon, for which the temperature of the central urban locations are several degrees higher than those of nearby rural or suburb areas of similar elevation, particularly at night.

In general, the Urban Heat Island effect is due to the increasing urbanization of the territory, resulting in the progressive replacement of natural surfaces by built surfaces into and around the city areas. In the cities the global warming of the planet is more visible than in other areas due to the almost complete lacking of green areas. A phenomenon that could lead to health emergency and deep social degradation of certain urban areas.

However the Urban Heat Islands can be prevented, by means of operative and informative activities, involving and stimulating users and decision makers. What have been realised in 10 European cities (Athens, Bari, Brussels, Budapest, Lisbon, London, Madrid, Paris, Seville and Thessaloniki) within the *UHI - Urban Heat Island and Urban Thermography* project

funded by the European Space Agency (ESA) in the framework of the DUE program, is enlightening.

For each of those 10 urban areas have been realised geoinformation products and services with the aim of:

- monitoring the Urban Heat Island phenomenon at different scales and periodicity, using data from various satellites starting from low resolution (few kilometers) up to airborne sensors at very high resolution (from 30 up to 5 meters);

- determining the risk of occurrence of Urban Heat Islands during the spring/summer period;

- near-real-time risk evaluation and forecasting of the occurrence of heat waves or Urban Heat Islands, together with the impact of meteorologic weather on the citizens health, by means of specific indicators;

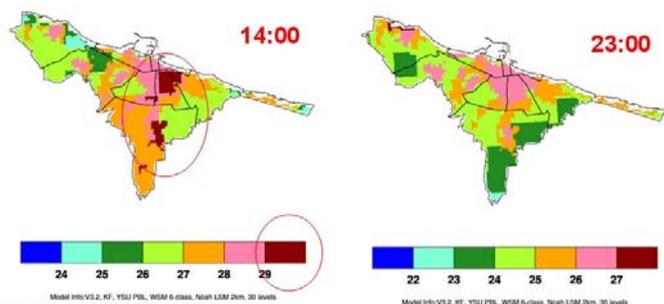
- supporting the studies on the energetic balance and the laws and policies concerning energy efficiency, by means of thermographic maps.

In particular in the UHI project have been implemented products and services which, made available during the summer period, can powerfully support the prevention of risks for the population and the urban territory.

Starting from the air temperature products delivered in near real time and as three-days forecasting over urban and suburban areas - at 1km spatial resolution - other information derive, with the same resolution and frequency: thermal stress indexes, to determine the impact of the weather conditions on the human health; Urban Heat Island maps, for the identification of areas with a low or high heat emission within the urban zone; hazard and risk maps of heat waves occurrence, for the definition of the urban areas at high-medium-low risk, integrating also local socio-economic information.

The city of Bari in the UHI project

Within the UHI project, the city of Bari - in particular the local section of the Civil Protection within the Bari Municipality - is one of the users for which some products have been realised (in particular maps of Land Surface Temperature, Air Temperature, Urban Heat Island risk from historical data, in near real time and as forecasting). The Municipality of Bari actively contributed to the collection of the products requirements and the possibility to integrate them into the existing monitoring system.



Air Temperature Forecast of Bari.

The current heat wave risk management of the Italian Civil Protection is based on some statistical studies relating the recorded deaths or illnesses, linked to summer heat, to the registered air temperatures at reference locations. For the city of Bari such location is currently the meteo station of the Italian Air Force placed to the nearby Bari Palese Airport, to which six meteo stations distributed among the city territory are added. The output is a daily bulletin which forecasts for the current and the next two days the potential occurrence and effects of heat waves.

The advantage of using the products from the UHI project, stays into the capability of monitoring the air temperature and the UHI effect continuously over all the city, with different frequency and resolution, so allowing to work on single areas (e.g. districts or quarters). This contributes to the forecasting of risks, but also to the mitigation of their effects, thanks to dedicated information campaigns for making population more sensitive to the problem. Moreover those resources are very useful for measuring the energetic efficiency of the various city areas and for creating maps useful for the urban planning and the energetic policy at municipal level.

The complete description of the project is available at: www.planetek.it/UHI_eng

ASK THEM

Need more information? Feel free to contact our GMES experts of the European Institutions SBU.



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UHI project: examples of products.

Land Surface Temperature – Athens

Example of daily land surface temperature, at 1km resolution, produced over the Greater Athens area. This kind of maps allow to identify “hot spots” in respect to surrounding areas, linked to their soil and urbanisation characteristics (fig.1).

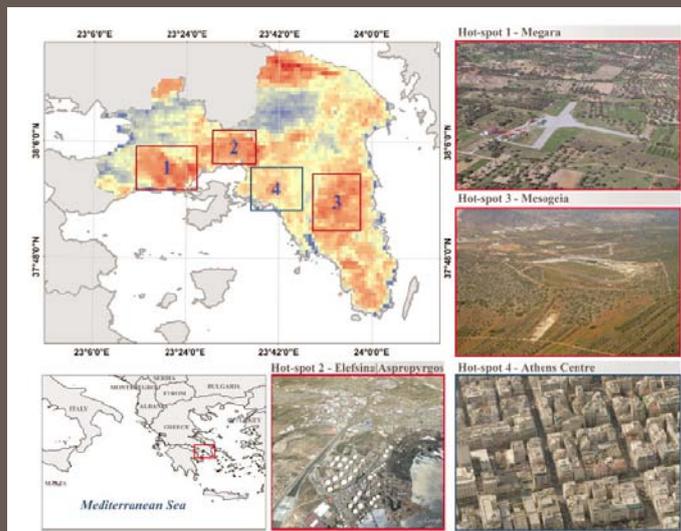


Fig. 1 Land Surface Temperature of Greater Athens Area

Very high Resolution Urban Thermography – Brussels

A thermographic map at very high resolution allows to measure the heat emission from the roof of a building. The map into the example has been realised during a winter night and allowed to highlight “hot” buildings, that is which greater dissipate the heat from the inner warming systems through the roof (fig.4).

Air Temperature – Paris

In the air temperature (at 2m height) map, the Urban Heat Island effect is well visible: the temperature in the central areas of the city is 2-3°C higher than the suburbs (fig.3).

Buildings Energy Efficiency – Madrid

Another application (fig.2) for the thermographic maps at very high resolution of building is, during the summer, the measurement of its efficiency in dissipating the heat accumulated during the day: in theory a building much more warm at day than at night, means a lower efficiency in dissipating the heat and so higher costs for the daily air conditioning of its internal spaces.



Fig. 2 Madrid. Day-night temperature difference index transformed in a building energy efficiency classification.

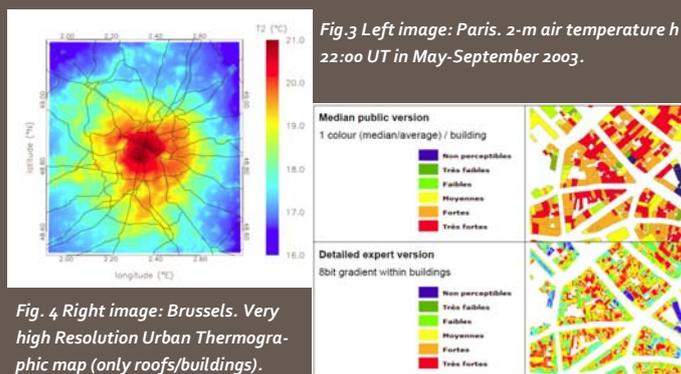


Fig. 4 Right image: Brussels. Very high Resolution Urban Thermographic map (only roofs/buildings).



Protecting marine & coastal environment

New monitoring methods, based on Earth Observation data, became mature and brought to concrete and operative results

The oil leakage disaster offshore the Louisiana coast in 2010 recalls the attention on the policies of management and protection of the sea and the coasts. Unfortunately it seems necessary the occurrence of such events to awake the attention over environmental protection topics.

The monitoring of sea is a topic naturally relevant for countries, like Italy, which have thousands of kilometers of coasts that represent a resource to exploit, protect and preserve for the future generations.

The sea and coasts monitoring is also a priority topic for the European Community and a lot of research or pilot projects are currently ongoing for testing new monitoring techniques also based on satellite data.

The **Marcoast** (www.marcoast.eu) is among them. In the three-year period 2006-2008 the project funded by the European Space Agency in the GMES framework, delivered a service of Oil Spill and of Water Quality daily monitoring, providing maps of e.g. sea surface temperature and chlorophyll over the EU coastal waters.

The move from a sperimental phase to an operational one is the critical point which determines the success, or in alternative, the failure of solutions based on innovative methodologies like Marcoast. Those service need to demonstrate on the field to be reliable, applicable over large areas, economical sustainable and can be efficiently integrated into the decisional processes of the Users. That is they have to really matter into the operative decisions that the users need to take during their institutional duties.

The succes of the Marcoast project has been significative, since the monitoring activities of Oil Spill from satellite have been considered of interest from EMSA (European Maritime Security Agency), which adopted those methodologies for their duties, starting a daily monitoring service using satellite data, now completely integrated into their operative workflow.

Officially started on January 2010, MarCoast2 would like to demonstrate that also the services of sea water quality reached the maturity and can be adopted at an operational level. The project is funded by the European Space Agency in the framework of the GMES Marine and Coastal Information Downstream Services (www.marcoast.eu).

Marcoast2 has the objective of reaching a more operative involvement of national and regional environmental agencies (in Italy ISPRA and ARPA of Emilia Romagna, Campania and Puglia) to stimulate the adoption, also in this applicative field, of operational services derived from satellite monitoring.

A consortium of european partners, belonging to the industry and research worlds, make available to the institutions responsible for the environmental policies their experience into the satellite data processing for the measurement of water quality parameters, particularly for the coastal areas. Planetek Italia is coordinator at European level of the Water Quality service and also provides maps of some indicators related to waetr quality like the sea surface temperatura, th e transparency and the chlorophyll concentration on all the Italian seas.



The project has a duration of 3 years and another objective is to reach the continuity and improvement of the operative services with the aim of making them nearer to the user needs. All this for making further grow the awareness within the Environmental Agencies that this new way of monitoring is no more experimental, but is able to give concrete and operative results that could be immediately used.

The results of Marcoast project 2006/2008

During the three years of the Marcoast project, Planetek Italia delivered to the institutional user ISPRA and, for 2008, to ARPA Emilia Romagna and ARPA Campania, various monitoring services with daily provision of chlorophyll and sea surface temperature maps for the Adriatic, Tyrrhenian and Ligurian seas.

The services' products have been validated by means of a comparative analysis over the Adriatic sea using in situ data from SiDiMar and from ARPA E.R. campaigns. The comparison resulted in a good correlation between the satellite derived measurements and the ones done at sea with traditional sampling techniques.

Further validation analysis have been done, confirming that the chlorophyll concentration measured using satellite data follows the seasonal trends. In particular, the classification of water done using the Percentile 90 was in good agreement with the studies conducted by ARPA E.R. at the Cesenatico and Cattolica sites (ARPA E.R., 2007).

The results of Marcoast2 project 2010/2012

In Marcoast2 the Planetek services extended to all Italian seas and to two more users ARPA Puglia and Italian Coast Guard. The products have been improved to obtain improved product near the coast. Promising results have been obtained in some test areas in Campania and Emilia Romagna using in situ measurements from ARPA. Moreover calibration procedures to improve the products over specific areas have been realised, in collaboration with the research project AquaMar (the test area was the Puglia coast).

Another aimed goal of the project is to define a roadmap to reach the economical and technological sustainability of the services, creating an european network for the water quality monitoring under the MarCoast flag, with the aim to support the National Authorities to abide the european and national directives over the water quality, integrating the traditional measurements at sea with the satellite products.

To know more: www.planetek.it/eng/projects/marcoast

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MARCOAST, Aquamar & Posidonia Maps

MarCoast2

MarCoast2 (Marine & Coastal Environmental Information Services) is a three-years project (2010 - 2012) funded by the European Space Agency (ESA) under the GMES Service Element framework. MarCoast delivers, regularly, a large portfolio of products for supporting the monitoring of the European seas in terms of water quality and algae bloom, for institutional users directly involved into the project. The water quality monitoring services in MarCoast are currently delivered by 14 service providers to 45 users from 16 different European countries. The services cover all the major European sea areas and provide a near real time surveillance for the water quality. Moreover all the products follow a rigorous protocol to verify and validate their quality, including the comparison with measurement at sea.

AquaMar

The AquaMar (Marine Water Quality Information Services) project is research and developing downstream services turning Marine Core Service products into advanced Water Quality services, demanded by end user. One of the main objectives of the project is to improve existing products and develop new products for supporting user duties of control and reporting at European level.

AquaMar proposes service for obtaining:

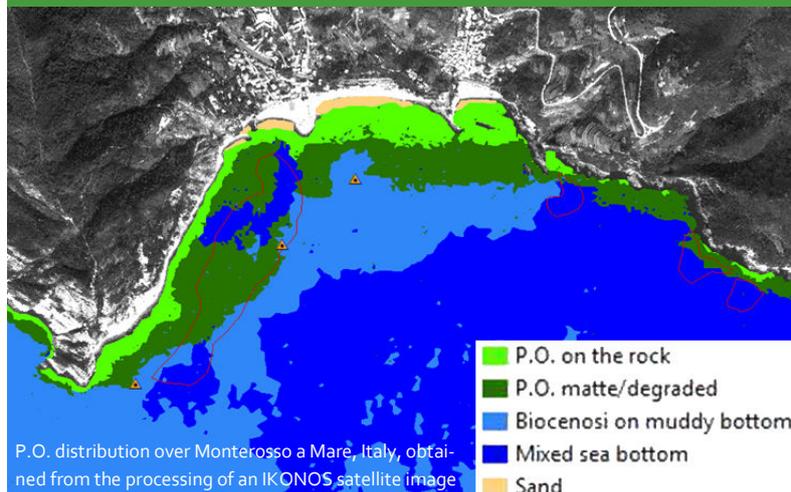
- Indicators for the reporting requirement of the Water Framework Directive and the European Marine Strategy
- Detection of harmful algal blooms
- Support to large scale marine infrastructures
- Services supporting the Bathing Water directive monitoring
- Aquaculture precision farming

MarCoast & AquaMar official website is www.marcoast.eu

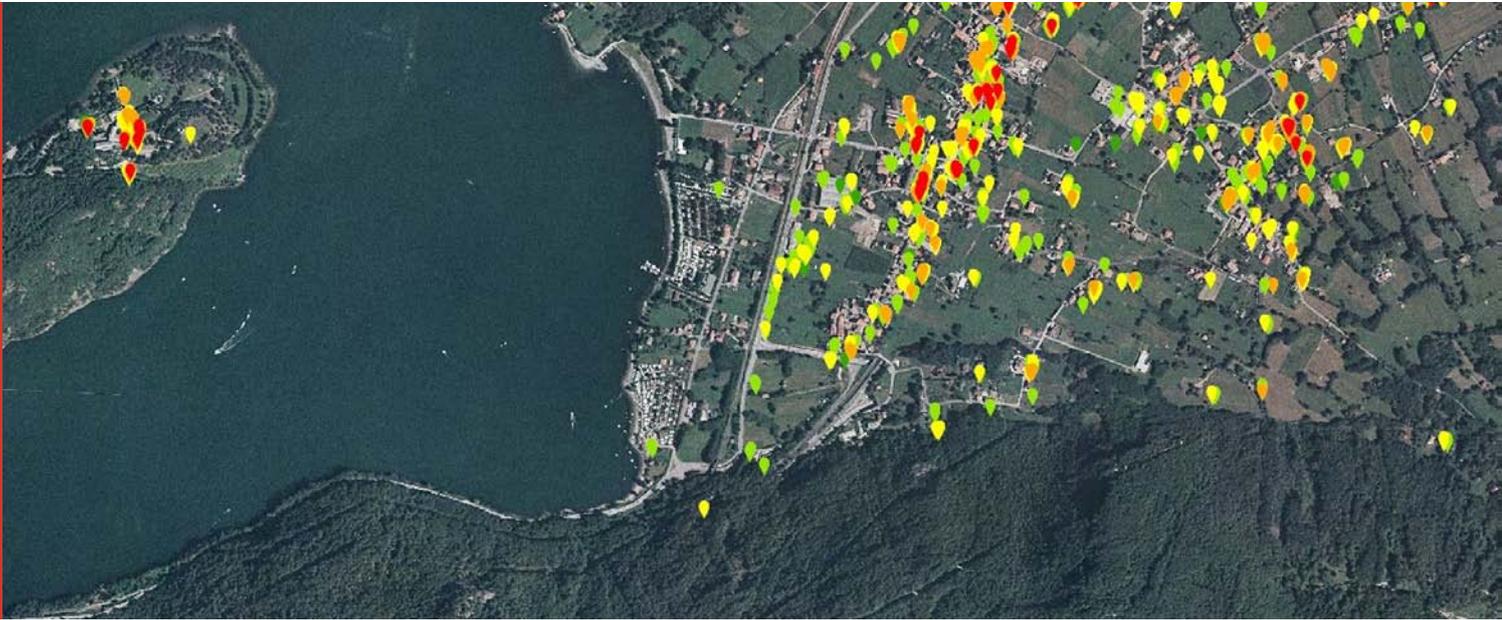
SIMS - Posidonia Maps

The SIMS project (2009-2011), funded by ESA, had the objective of defining and implementing methodologies for the mapping and monitoring of phanerogam marine plants and in particular Posidonia Oceanica (P.O.), in coastal areas using Earth Observation data.

The implemented products aim in supporting operatively both the public institutions and the private firms in their institutional duties of managing and monitoring the vegetal marine ecosystems, in particular those with P.O. which, both at the national at the whole Mediterranean basin level, is amongst the most important species. The demonstration maps realised on two study areas (S. Marinella in the Tyrrhenian sea and Monterosso in the Ligurian Sea) varies from the posidonia distribution, to various indexes (LAI, density, Giraud), up to the phenological characterisation of the plants with the integration of in situ measurements.



P.O. distribution over Monterosso a Mare, Italy, obtained from the processing of an IKONOS satellite image



Towards landslides forecasting

The traditional monitoring methodologies based on ground-based instruments can't be the right support for Civil Protection emergency response: Radar data is the answer

In Italy, civil protection activities are based on a complex organization that involves many actors, from public (state, regions, provinces and municipalities) that have the task of coordinating the emergency relief phase, technical structures and national research (ISPRA, INGV, CNR, ENEA) law enforcement (Police, Police, Army), the Fire brigade, to the great world of volunteering, working at various levels and with different skills dirtying his hands directly, unfortunately, in mud and rubble.

In short, our little country, as geologically young and active, it is often plagued by natural disasters that put a strain on people, often marking them so painfully. The L'Aquila earthquake, landslides in Giampilieri and the latest tragedy of Ischia are just the most recent.

And when there are victims and damage are incalculable, the people inevitably look for a guilty party, for late rescue, for houses built in a black spot or without a suitable design criteria. As always, the responsibilities are not all on one side, on the contrary, citizens themselves are part of the system of civil protection, that they would charge as much as possible and aware of the risks they face.

And it is the awareness of reality, the real weak point of a system of civil protection. How well do you know the area? Which method do we use to quantify the risks? To answer these questions means to go beyond the logic of emergency, that is to act always and only to the disaster, when you are in the water and mud to your neck, with the debris that falls on the head.

All this is possible only by setting up effective and efficient monitoring systems of the territory, the very heart of decision support systems (DSS). In Italy the National System of Civil Protection looks at Functional Centres - both National department and decentralized regional departments - the structures in charge of the technical-scientific study and monitoring

of the territory, aimed at the characterization of risks: hydro-geological, seismic, volcano, or forest fires.

The combination of the activities of civil protection and land monitoring, however, it is often complex and ineffective, as the first work on tight deadlines and need to find information quickly and reliably, the latter are often based on networks of instruments characterized by complex data streams collections, inadequate to the "real time". For example the risk with instability of the slopes. The traditional methods for monitoring landslides consist to the extent of property or morphological, lithological, pedological, hydrological, topographical surface and subsoil, and for the monitoring of deformations due to instabilities are used clinometers, or more recently, GPS devices, which generally provide navigation data in telemetry, devices using GSM or radio.

The major limitations of these technologies based on ground-based instruments are related to the spatial distribution of these - and therefore to their measure collections - generally limited, as well as a lack of precision of the measurements of the vertical movement, of great importance for the monitoring of landslide kinematics slow. Another big problem is then just the criteria of placement of the devices, usually of known instability, which leads to the exclusion from monitoring other potentially dangerous areas. Earth Observation (EO) technologies can support more effectively and quickly to the emergencies and risk monitoring needs.

Are undoubted therefore the enormous potential that characterize an analysis of the area based on satellite remote sensing: speed of data retrieval, width of the zone explored, high geometric accuracy, fast data processing. In this context a promising technology with potential applications for EO monitoring of landslides is the differential interferometry (DInSAR), applied to SAR images taken from satellite or terrestrial platforms. The main advantage of the technology DIn-

SAR - not yet fully explored - consists of a geographic display (spatially distributed) of the deformations, at the expense of a considerably reduced temporal resolution (on the order of a few or several months). In this sense, the technology DInSAR is complementary to GPS technology.

MORFEO

In this context, the three-year pilot project MORFEO, commissioned by the Italian Space Agency (ASI), creates a system to support decisions on civil protection landslide risk. The objective of the project is to provide the user tools for the identification and mapping of landslides, landslide monitoring, evaluation of susceptibility, hazard and landslide risk, forecasting, and the foreshadowing of landslides and assessment of damage from landslides.



Planetek Italia is a partner with the Polytechnic of Bari sub-system EO SAR of the project, which uses jointly technologies GPS, remote sensing optical images and SAR (Synthetic Aperture Radar), through interferometric techniques. The prediction of landslide is carried out using series of acquisitions, necessary for the processing interferometry, using data acquired from space missions ERS 2 and ENVISAT C-band sensor, and is scheduled for the later stages of the project the use of data from missions COSMO-SkyMed (X-band), SAOCOM (L-band) and PALSAR (L-band). The maps of deformation of the soil are composed of a set of points on the ground defined Persistent Scatterers (PS). The analysis of the movements of PS, detectable with millimeter precision, can successfully prevent the occurrence of landslides or mudslides.

For further information visit <http://www.morfeoproject.it>

ASK THEM

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PROJECTS: MORFEO, SLAM & MASSIVE

MORFEO (Landslide Monitoring and Risk with Earth Observation data) is a pilot project funded by the Italian Space Agency (ASI) with the aim of “developing a product application supporting the Italian Civil Protection in decisions about the landslide risk, integrating the traditional methods with Earth Observation technologies and data.

The institutional reference of the project is the network of centers and functional competence of the Italian Department of Civil Protection.

The main objectives of MORFEO are:

- Develop a prototype system to support decisions of Civil Protection against landslides
- Integrate information, Earth observation data and technologies with traditional ones collected on the ground, to improve the current capabilities in mapping, monitoring and predicting landslides.
- Exploring the use of innovative Earth observation data, such as those provided by the COSMO-SkyMed constellation.

As a follow up to what is fixed in the cooperation agreements between ASI and the Department, MORFEO provides the National Civil Protection with a system able to provide products and services to support the forecasting and monitoring for the management of an emergency.

SLAM – Service for Landslides Monitoring

The SLAM project was funded by the European Space Agency (ESA) within the framework of the DUP program (Data User Programme). The goal was to generate three products oriented to landslide monitoring and mapping: Landslide Motion Survey, Landslide Displacement monitoring, Landslide Susceptibility mapping. The products has been designed for the hydrogeological risk management.

The SLAM products has been derived from integration of data acquired by traditional methodologies and by Earth Observation into a GIS environment.

The realization of SLAM project has been carried out by an international Consortium led by Planetek Italia and by other five partners: Tele-Rilevamento Europa, Gamma Remote Sensing, Spacebel, Geotest and the University of Florence.

MASSIVE - Mapping Seismic Vulnerability and Risk of Cities

The main focus of the European Project MASSIVE is to provide Civil Protection with assessments of seismic hazard, seismic vulnerability and risk for buildings at local scale, as well as to estimate the traffic load due to uncontrolled city evacuation. The project, started in January 2010, allows running site specific earthquake scenarios and helps the local authorities, as well as organisations involved in Civil Protection and Emergency Response, to assess the likelihood for potential damage occurrence in the affected areas.

Two European pilot sites, heavily struck by earthquakes in the past, namely the North-Western part of Attica (Greece, earthquake of September 1999), and L’Aquila (Italy, earthquake of April 2009) have been selected for this purpose. The Project is financed by ECHO, the European Commission Humanitarian Aid and Civil Protection Directorate-General.

The project is coordinated by NOA/ISARS and involves as a partner Planetek Italia, Institute of Geodynamics/NOA, National Technical University of Athens, GEOAPIKONISIS S.A. and Institute of Engineering Seismology and Earthquake Engineering.



The European INSPIRE Geoportal

The European Union Geoportal will allow cross-border, multi-lingual and harmonized access to the Member States' territorial data

The INSPIRE Directive of 2007 aims at establishing an "Infrastructure for Spatial Information in the European Community". It builds upon existing infrastructures in the European Member States in order to provide access to electronically available spatial data sets held by or on behalf of Public Authorities to assist policy-making in relation to policies and activities that may have a direct or indirect impact on the environment. In order to make these spatial data sets discoverable and accessible, the Directive requires the Member States to set up INSPIRE discovery, view, download, transformation and invoke network services.

As a central European point of access to these INSPIRE network services, the European Commission will set up an INSPIRE geoportal. This geoportal will allow cross-border, multi-lingual and harmonized access to the Member States' INSPIRE network services. The technical specifications for this INSPIRE geoportal are based on past research and prototyping experience gained by the Spatial Data Infrastructure unit of the European Commission's Joint Research Centre. They form the basis for the current development, carried out by a consortium consisting of Planetek Italia and lat/lon.

Developments started in March 2011 and are expected to take eighteen months after which the INSPIRE geoportal will be installed in the hosting environment of DIGIT (EC's Directorate General for Information Technology) and operated by DG-ESTAT (Directorate General Eurostat).

The Geoportal "Interactive Discovery"

The usability of the Geoportal is one main focus of the development, in particular for the "Interactive Discovery", which will allow the user to search through all INSPIRE spatial datasets in an easy yet powerful way. The detailed requirements set by the tender are mostly functional; the challenge is to put together the single functions into an intuitive information

flow and User Interface design.

From a survey of existing geoportals and other search websites emerged a high need for **integration** of all search functionalities in **one single web-page**, in order to avoid frustrating forth and back. This integration allows for a high interaction between page elements such as search parameters, result list and result preview in a geoviewer, leading to an "Interactive Discovery" client.

Another key aspect of this *Interactive Discovery* is also to provide the user during his search with the right suggestions extracted from the thesaurus, other key code lists and the metadata itself, offering hints to the user, how much results he can expect from a given search parameter value. This imposes also high requirements on the responsiveness of the underlying Discovery Services, the metadata of which for this reason are locally cached by the system.

The user can then select spatial datasets directly from the result list into his working session context, in order to further explore them within the "GeoNavigation" viewer. This viewer allows the user to combine and overlay different layers with transparency and define their order, providing all basic functionality to arrange different layers to a **customized map**. These maps can be shared with other users within the portal or extracted into standard Web Map Context files with pointers to the original Member State's services.

The Geoportal's architecture is modular and ready to be extended by additional functionality, like download services and other INSPIRE network services access. It is based on a



Content Management System, which allows also for the easy integration of standard, non-geospatial portal functions and informational pages.

Under the hood...

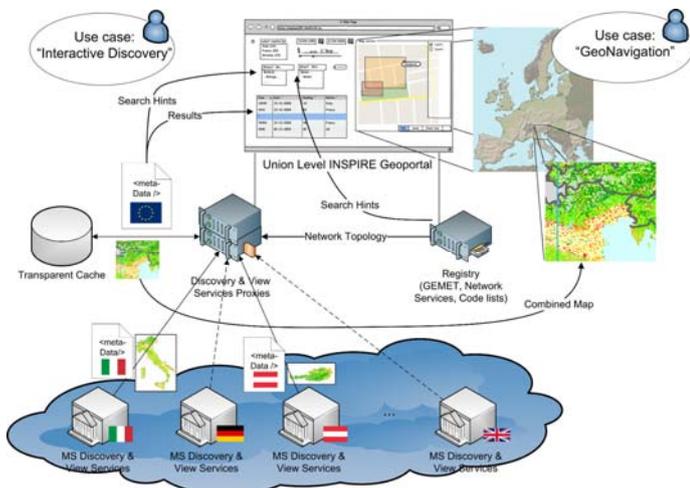
To ensure quick responses to the users' data searches, the Web Portal is connected to a 'proxy' component.

Initially some Discovery Service endpoint per Member State is registered. A crawler harvests metadata from these Discovery Services and stores them in a cache. From these metadata sets, INSPIRE relevant View Service endpoints and layers are derived and registered.

Map tiles for small scale views are stored in a tile cache, while map requests for larger scales are forwarded to the offering View Service from the respective Member State. The caches are initially filled and regularly updated.

Open source commitment

The project makes high usage of open source products. The proxy services are based on deegree and jackrabbit and new code will be contributed to deegree. The portal itself is ba-



sed on the CMS plone and the newly developed portal components "Interactive Discovery" and "GeoNavigation" will be made available under the EUPL license.

<http://inspire-geoportal.ec.europa.eu>

ASK THEM

Need more information? Feel free to contact the persons in charge of the development of the European INSPIRE Geoportal.



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THE EUROPEAN INSPIRE GEOPORTAL AWARDED TO PLANETEK ITALIA

Planetek Italia has been awarded the tender for the "Development of the technical components of the INSPIRE Geoportal at European Level", of the Joint Research Centre (JRC) - Institute for Environment and Sustainability. This version will substitute at operational level the current prototype developed by the JRC .

The INSPIRE Geoportal will be the single access point to global European environment geoinformation resources shared and made available by all member states within the framework of the "Infrastructure for Spatial Information in the European Community" (INSPIRE) Directive. The main objective of this project is to provide the operational version of the INSPIRE Geoportal at European level, including integration interfaces for discovery and view services from member states' national Geoportals.

The technical proposal, made by Planetek Italia, prime contractor, and lat/lon (www.lat-lon.de), is entirely based on Open Source technologies and OGC standards. The project will be realized in 18 months utilising the Design Thinking paradigm, the working philosophy adopted by Planetek Italia for its activities.

Visit the official INSPIRE website:
<http://inspire.ec.europa.eu>



The project team of Planetek Italia & lat/lon

THE USE OF FREE SOFTWARE FOR COMPLEX PROJECTS



The development of geoportals through the integration of free and of owner software is a choice in the development that enables to get systems characterized by highly innovative and imaginative elements, high performances, economic sustainability and respect for the pre-existing technology constraints. The opportunity to pursue different technological choices for producers, languages and philosophies is made possible thanks to full interoperability standards of the Open Geospatial Consortium, which allow access to free software in technological contexts historically protected. We have opted free software geospatial for the implementation of three complex systems operating in very different contexts: a local government, a Space Agency and the European Commission: the Geoportal of Emilia Romagna Region, the portal of Planetary Radar Operation Center of the Italian Space Agency, the European INSPIRE Geoportal.

These three projects were presented at the 2011 Conference GFOSS – the 4th Italian conference on geographic software and geographic data free held in Foggia, Italy.

<http://www.planetek.it/gfoss2011>



Royaume du Maroc

Français

Recherche

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وزارة الصيد البحري

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MAROC
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AGRICOLE

Actualités



Des grains de bonne qualité au titre de la campagne...
10/07/2012, La campagne céréalière 2012 a...



Campagne Agricole 2011-2012 : Production Céréalière
09/07/2012, La production définitive des trois principales...



Accès Filières



Design Thinking in Morocco

Developing the Spatial Data Infrastructure of the Ministère de l'Agriculture et de la Pêche Maritime - Royaume du Maroc

The Government of the Kingdom of Morocco and the Government of the United States of America, acting through the Millennium Challenge Corporation (MCC), signed in 2007 a Compact Millennium Challenge Account in order to contribute to the poverty reduction through the economic growth in Morocco.

In this context the Directorate of Strategy and Statistics (DSS) of the Moroccan Ministry for the Agriculture called for the realization of a Geographic Information System based on the Web.

Planetek Italia has then been awarded this important project whose aim is to facilitate the access to the information related to the Millennium Challenge Account projects regarding fruit trees production, small scale fisheries, functional literacy and vocational training, and business support.

The aim of this project is also the integration of the existing geographical information systems, in order to improve the capitalization and the coherence of all existing information, to improve the performance monitoring of MCA-Morocco projects and, last but not least, to improve the quality and organization of information sharing, the technical data analysis, the mapping and the spatial data analysis.

The GIS application developed is both an intranet and extranet application that allows various users both of the DSS of the Moroccan Ministry for the Agriculture, and the Direction of Monitoring & Evaluation of the Moroccan Agency of Partnership for Progress (APP), to quick and easy access to data and statistical information available on the servers of the Ministry or the APP.

The solution implemented is a Spatial Data Infrastructure based on the Web that guarantees the deployment and use of GIS tools and data throughout the Department and the APP, the integration with other information systems, using standard software interfaces and methods, the centralized hosting of critical GIS functions that are this way accessible to many users inside the organization, the distributed GIS processing capabilities (such as analyzing and managing distributed GIS data) and the delivery via Internet of comprehensive GIS functionalities.

To accommodate the cooperative process involving multiple parties, public and private, with very diverse skills and knowledge, Planetek Italia has promoted the adoption of the Design Thinking methodology in all the phases of the project.

Design Thinking is a process that seeks to include in decision-making, since the beginning of the development of a project, the user.

This approach then tries to combine, in an iterative process, Technological Capabilities, User Requirements and the Sustainability of Service. Main goal is to overcome a logic of planning based on a single flow (starting from user requirements, transform them into specific, being followed by the development and ending with the acceptance) to focus instead on an iterative process of definition, exploration, description and evolution.

Sharing the Design Thinking philosophy inside the working group is a winning choice, because it leads to naturally look at the entire system from the perspective of those who will

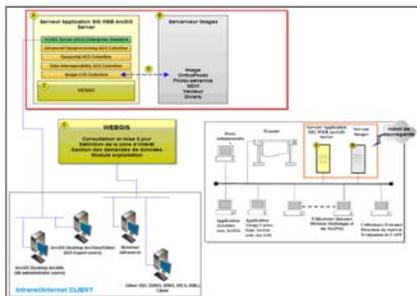


use it, rather than through the distorting lenses of technology.

The Geoportal of Agriculture & Phishing Ministry of Maroc

The objective of the project, founded by the MCA cooperation program, is the reengineering and rethinking of the current structure of the wide collection of datasets owned by the Maroc Ministry of Agriculture & Phishing (MAPM) and its technical partners (DSS, APP, and others), and further to design also a new publishing and storage architecture, with a more centralized and optimized solution.

The project, organized in 3 iterative steps, with two prototypes, within 12 months, has planned activities of requirement analysis, design of a new geospatial platform and a new geospatial data-model, furthermore development of a simple-use and open web geoportal that will allow internal and external (public) users to easily access agricultural and fishing metadata of the Maroc territory. The collection of Rasters, Vectors and documental files already owned by the Ministry and its partners, has been then reorganized, in order to be easily integrated in the new web architecture. At data level the main need has been to analyze and re-design a new integrated centralized and optimized geodatabase, having coherent information stored.



The Web platform is deployed in a simple architecture with two servers. An application server hosts the Geoportal, based on an open source platform, and the GIS Server. The data server hosts the DBMS, based on both COTS and open source tools. The database manager hosts both datasets and metadata sets. Metadata are stored in ISO 19115, and ISO 19115-2 format.

The geoportal administrator is enabled to manage contents and user permissions at geoportal level. Furthermore users, at base level, are able to access functionalities as metadata discovery, maps navigation with pan/zoom, advanced printing, and geographic queries. After the logging in, at more deep level, depending on the authorizations, the internal user is able to download maps on his web client, temporary or permanently upload maps, create new maps merging them with other maps, editing via web the feature classes of the map.

ASK THEM

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Environment and Forest Monitoring services in Europe

Planetek Italia has a long experience in European and International projects in the field of environment, agriculture and forests monitoring and mapping.

The company already involved in GMES Initial Operations (GIO) Land Monitoring Services, in the year 2012 has been awarded the tender for the production of the “high-resolution map of Forest and Impervious Area characteristics in southern Europe, 'partim' west and central Mediterranean region” for the European Environment Agency (EEA).

European Environment Agency



Previous R&D projects in this field in which Planetek Italia participated are Kyoto-INV and GMES Service Elements Forest Monitoring.

GSE Forest Monitoring is an European Space Agency (ESA) funded project whose scope is to consolidate services under the EU priority theme “Land Cover Change in Europe”. GSE Forest Monitoring supplies accurate, timely and readily available information on the state of forest systems in order to support more informed decisions and improved policies that enable sustainable forest management and related activities.

As in Kyoto-Inv project, Planetek Italia has provided maps for the Spanish Ministerio de Medio Ambiente (MMA), Dirección General para la Biodiversidad (DGB), by covering the areas of Lleida, Girona, Barcelona, Tarragona, Badajoz and Cáceres (about 21.800 Km²).



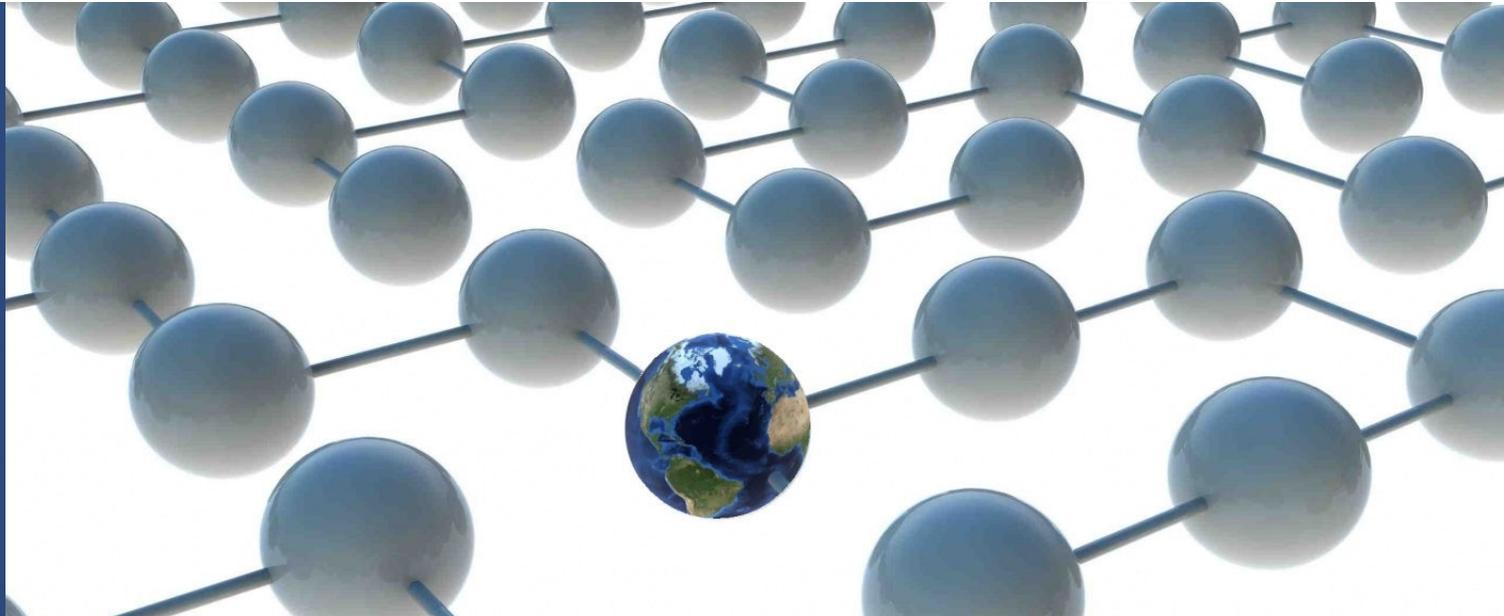
The products, obtained by processing Landsat 5

and Landsat 7 data (spatial resolution 30 m), are:

- Land Use Map
- Forest Map
- Land Use Change Map

For further information:

<http://www.gmes-forest.info>



Towards Geographic Linked Open Data

A reusable solution to publish cartographic data and their metadata in open data portals in the form of LOD (Linked Open Data)

An increasing number of public and private bodies makes their geographic data available as open data with licenses that allow their free use and exploitation.

Open data is the natural evolution of the free sharing of databases: data and its metadata are provided in a standard format and organized in a standard data structure, according to rules defined at international level. These characteristics make them directly usable by software applications without any human intervention: they can, for example, be used by smartphone Apps, be indexed on open data search engines and integrated with open data portals.

In cooperation with SINERGIS Srl, an Italian company working in the field of geographic information, we have combined our expertise to realize a useful solution to publish geographical Open Data in the form of Linked Open Data.

We have designed a software application that allows to transform data and web mapping services into open data compliant to the "five star" classification given by Tim Berners-Lee - i.e. a standard format and structure that can be directly used by computer applications without manual intervention.

By making geographic information available in the form of open data, with particular attention to the RDF / XML format, we ensure the use of data as Linked Open Data, and then their reuse, the indexing on open data search engines, the integration with open data portals or with the Comprehensive Knowledge Archive Network (CKAN), the cataloguing of the free dataset and projects.

We aimed at creating an OPEN and reusable solution, which can be integrated into any cartographic Geoportal or SDI (Spatial Data Infrastructure) based on the interoperability standards defined by the Open Geospatial Consortium (OGC®). The geographic open data can be exploited both in RDF and in other interchange formats (for example in Shape File format).

The Emilia-Romagna Region case

The first components of the solution have been generated in a project for the evolutionary development of the spatial infrastructure of the Emilia-Romagna Region, Italy. This regional SDI is based upon a metadata catalogue and a repository manager that organizes the access to geographical data, and it has been completed by applications and services oriented at different levels of government, that are now accessible through a single interface, the regional GeoPortal ("GeoPortale ER", <http://geoportale.regione.emilia-romagna.it>)

Developed by Planetek Italia, GeoPortale ER provides access to regional data and metadata through several services that allow users to discover data in the catalogue, using both graphical and alphanumeric criteria, and to browse, use and download the data of interest. Thus, GeoPortale ER enables the dissemination, use and publishing of data, information and geographical services both to the public and the staff of local /national Public Administrations, in accordance with the latest regional and national directives (DigitPA, Intesa GIS) and international standards (INSPIRE, OGC) related to interoperability.

In this framework, the Emilia-Romagna regional administration has decided to provide access to Data and Metadata handled by its SDI as Open Data, with particular attention to the RDF / XML, and therefore in the form of Linked Open Data. With reference to cartographic information, it has been decided to publish only some classes of spatial objects as Linked Open Data, notably those that identify the main spatial reference objects such as buildings, street address, City and Administrative limits, and road Toponyms.

Preparatory to the actual publication of data RDF / XML is of course the definition of the regional ontologies, which describe the significance of the data to be published. During the ontology definition phase, it is recommended identifying the

possible links to the already existing LOD datasets and belonging to the so-called LOD Cloud, in order to convert the regional dataset into an additional node of the LOD cloud itself. Similarly, in the case of metadata, an ontology must be defined to describe the meaning of the ISO 19115 metadata. These can be downloaded from the Regional Geoport in XML format according to the pattern established by the ISO 19139 standard. This pattern can be mapped in an OWL ontology, and each metadata file can be translated into an RDF / XML based on this ontology.

While the publication of metadata in Linked Open Data format makes sense regardless of the particular data to which it refers, being noted and encoded the semantics of the metadata itself, this cannot be said for cartographic data. The publication of data in the form of linkable open data assumes significance when these data are linked to existing and already published data, and in turn they can potentially be related by others. This is generally true for any kind of data, but particularly for the geographic ones because, by their nature, they are the basis for the information correlation.

The data and metadata extraction services are based on the use of the standards defined by the OGC® for Geographic web-services. The data suitable for publication in the form of Linked Open Data are extracted in RDF format by leveraging the Web Feature Services (WFS) provided by Emilia Romagna SDI. On the other hand, the extraction of geographic metadata in RDF format is carried out using the standard OGC Catalogue Service for the Web (CSW). The metadata can therefore be associated to the RDF (Linked Open Data) and the shapefiles of the data.

The dynamic generation of RDF starting from web service exposed by the regional Geoportal ensures the continuous alignment of data with the regional Open Data Portal dati.emilia-romagna.it, which operates as the repository / index of data and metadata (including RDF).

Finally, the solution is entirely based on free open source software to ensure the reusability of the system.

ASK THEM

Feel free to contact our Government & Security SBU experts for any information about Geospatial Data Sharing on the Web.



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THE OPEN GEOSPATIAL CONSORTIUM'S MARKET REPORT ON INSPIRE RULES

On 25 April, the Open Geospatial Consortium (OGC, the non-profit international organization that is in charge of defining the technical specifications for the interoperability of geospatial services) released the Market Report "Open Standards and INSPIRE".



This report tries to provide a global view of the role played by OGC within INSPIRE and of how this important European Directive is implemented by the various Member States, trying to provide a systemic view of the extensive documentation available.

We have decided to help drawing up this report because we believe that, in order to make INSPIRE really "land", it is also necessary to explain the relationships existing between the legal obligations derived from the Implementing Rules and the technical indications and references to standards that are provided by the Technical Guidance, which do not have a legal value.

This initiative is part of a larger project on information and dissemination of geomatics knowledge in Italy, which led to the creation of the Italian INSPIRE Interest Group.

What is INSPIRE, how is it connected to the European initiatives for data sharing, what is the value of standards in the implementation of INSPIRE, which standards are necessary, what is the contribution of OGC: these are some of the questions that we try to answer in the Report, also by means of the description of the implementation strategies adopted by other Member States in order to establish the national SDI.



Read the article and download a free copy of the Market Report on blog.planetek.it





Geospatial products

Planetek Italia distribute and support some of the most known product used in land management applications.

Geospatial data, indexes and social geoportal for Urban Planning and S.E.A. monitoring

Urban planning, environmental monitoring, controls and assessment of agricultural and forestry production, map update, pre- and post-emergency management for civil protection, defense and security are the application areas that usually benefit of satellite data.

The **Preciso®** family consists of geo-information products, derived from satellite data, designed to provide cognitive frameworks that meet the specific needs of each application field.

The products can be combined to meet the most complex and diverse application and operational requirements. This feature makes them a flexible and modular solution.

Preciso® family consists of different products which fulfill specific needs:

- **Preciso® italia** and **Preciso® land**: provide updated remote sensing images, land use geodatabase, individual buildings and transport networks, and are designed to support the initial stage of the planning process.
- **Preciso® index**: provides environmental indicators supporting development plans decisions and SEA drafting.
- **Preciso® coast**: information chart of marine-coastal areas and of defense works.
- **Preciso® urban**: urban areas & unauthorized buildings monitoring
- **Preciso® fast**: fast collection of satellite images for emergency response
- **Preciso® on-line**: geo-informatic portal (social style) based on web technologies 2.0 to allow the exchange of information between all the stakeholders involved (citizens, private and public institutions).

All products are characterized by speed of production, high update frequency and low costs. Ideal for the analysis of the territory and the activation of the monitoring processes.

Preciso® products come from a long and intensive research conducted in the framework of national and international projects and have been tested in multiple operational projects. All pro-

ducts are "Ready to use" and ready for use, do not require specific skills and can be used with common GIS software.

Different local authorities in Italy have already adopted these solutions such as the Municipalities of Ascoli Piceno (Marche), Follonica (Tuscany), Apricena and Conversano (Apulia).

Brochures and the case histories on www.planetek.it/preciso



Satellite Data and DEM

GeoEye-1 or WorldView-2, the constellation Pleiades or COSMO-SkyMed, more and more, today, the Earth observation satellites, that provide multispectral imagery with a ground resolution of up to 50cm, can support your business efficiently and rapidly. This unprecedented availability of information sources with a higher revisit time, enables more punctual monitoring activities very helpful to follow the frequent changes in urban areas, with acquisition intervals that can be reduced up to a few days.

Thanks to their high flexibility, these new sensors can collect images of large areas, even more than 1.000 km² in a single passage. This means that the entire administrative area of a medium-large City can be covered in a morning and an entire province can be collected just in a few days. To have a synoptic view of the entire municipality or county, with this level of detail, is a huge of information with great value.

If we consider the possibility of receiving the data in a few



hours after their acquisition, the advantages in using them is clear.

Digital models for 3D simulation are widely used in planning and spatial planning, environmental monitoring, to support the organization of civil protection emergency response in case of natural disasters (flooding, floods, earthquakes) or in the defense sector.

In general, high-resolution elevation models are fundamental for applications that require a detailed elevation information. Planetek Italia has several solutions with worldwide coverage, with different levels of resolution, available as archive data or as new imagery collections. If needed we provide as a unique pack the high-resolution digital model, the orthorectified stereo images and the contour lines information layer, of the area of interest.

www.planetek.it/DEM

Cart@net is a simple tool to create and manage geoportals in accordance to the INSPIRE Directive.



Cart@net helps to create and customize Geoportals, to keep content up to date and to simplify the communication with users and stakeholders. It provides a powerful workflow to support the content management, and all contents can be geo-located. The layout is consistent with the Web portal that hosts the Geoportal: it ensures both the continuity in the aesthetic appearance and the full functionalities of the service offered.

Cart@net exposes the services foreseen by INSPIRE (Discovery, View, Download and Transformation Services). Users can easily access the Geoportal content and interact with an organization through the Forum, the News area, the multimedia Calendar and the integration with social networks like Facebook and Twitter. All spatial data are accompanied by their own license thanks to the content management interface of the Geoportal that helps, while publishing the data, to choose and easily produce the appropriate license to be associated with each dataset.

Geospatial SDI is for providers that need to manage and serve secure or licensed information using standards-based web services. Geospatial SDI offers an extensive set of web services, extending those offered in GeoMedia WebMap and GeoMedia WebMap Professional for SDI implementations.

ASK THEM

Feel free to contact our experts for any information about Geospatial products, satellite data and Intergraph|ERDAS software solutions characteristics and customer care.



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Planetek Italia & Intergraph

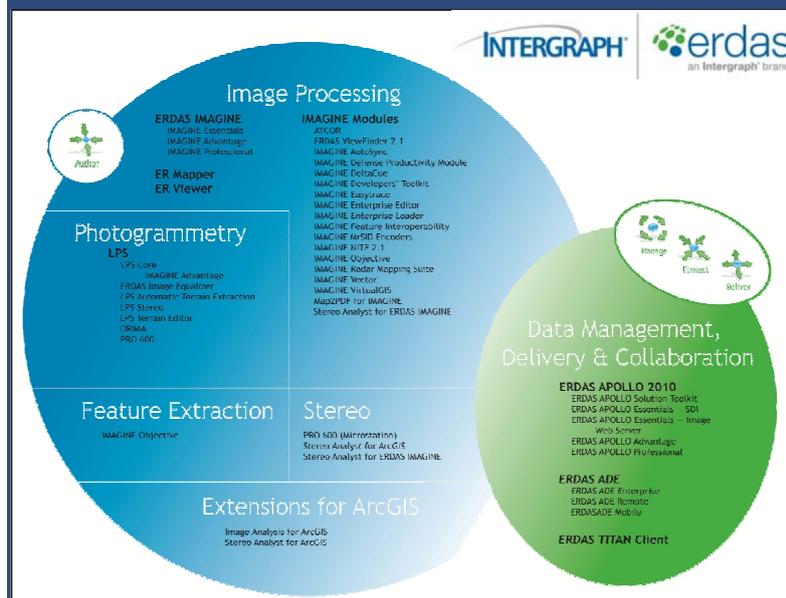
Planetek Italia is the Italian Master Dealer for Intergraph & ERDAS product suite. Intergraph and ERDAS geospatial product suite includes a market-leading portfolio of GIS, remote sensing, photogrammetry, and data management technologies that continue to lead innovation in the geospatial industry.

GeoMedia is a powerful GIS management package that enables to realize the maximum value of geospatial resources, integrating them to present clear, actionable information. It provides simultaneous access to geospatial data in almost any form, uniting them in a single map view for efficient processing, capture and maintenance, analysis, presentation, and sharing.

ERDAS IMAGINE is the world's leading geospatial data authoring software. It performs advanced remote sensing analysis and spatial modeling to create new information, that can be visualized in 2D, 3D, movies, and on cartographic quality map compositions. The core of the ERDAS IMAGINE Suite was designed to scale with any geospatial data production need; from IMAGINE Essentials, through IMAGINE Advantage and on to IMAGINE Professional. Optional add-on modules providing specialized functionalities are also available to enhance productivity and capabilities.

LPS is a complete suite of photogrammetric production tools for triangulation, generating terrain models, producing orthomosaics and extracting 3D features. Automating precision measurement, maintaining accuracy, and including flexible operations such as terrain editing and feature extraction, LPS increases productivity while ensuring high accuracy. Offering a variety of functional add-on modules, LPS adapts to any specific business need, enabling a seamless, process-driven workflow.

ERDAS APOLLO is an enterprise-class data management, delivery and collaboration solution providing remarkable business value for our customers. ERDAS APOLLO is scalable through clustering to meet your organization's specific needs. From a low-cost, remarkably fast image server to a comprehensive data management system, ERDAS APOLLO is the most advanced geospatial enterprise solution, ensuring unprecedented performance even when handling the largest data archives.





Preciso®

The power of the Wind

How Geospatial technologies can support the planning and operation of power wind farms

Energy has become a top priority for EU policy makers. Until now, a reliable energy supply has been taken for granted in modern society, but the availability of this supply is currently no more certain. Among the main reasons of this uncertainty there are the growing demand for energy by the developed countries and, in the meantime, the continued decline in the availability of conventional resources (fossil fuel) whose prices are continuously increasing.

A large contribution to power generation is theoretically available from wind energy. Wind is an abundant resource almost everywhere present and one of its advantages is the fact that the cost of electricity from the wind is fixed once the wind farm has been built. It is one of the fastest growing energy sources. Since 2000, around one third of all installed electricity generating capacity in the EU has been wind power and this will surely go on during the next decade.

Actually the major part of wind energy comes from on-shore plants, since off-shore ones are not yet very common. This is owed to a certain difficulty in realizing off-shore plants, communications and transmissions systems to the ground. This is the reason why wind energy from off-shore contributes only a very small share to Europe's total wind energy generation.

This is expected to change in the coming decades, in a perspective of a further growth of wind energy production, since wind conditions are more preferable off-shore and many well-placed on-shore sites will be already in use.

Onshore wind energy is a near-mature technology. The main technological development in recent years has been a trend towards ever larger wind turbines. But there are still important problems to be addressed, such as load management, grid integration and better storage capacities.

In both cases (on-shore and off-shore) the identification of the optimal site, through the preliminary analysis of local wind regimes, represents a very crucial aspect.

The lack of wind data on sites of interest is certainly the main problem. Moreover, solutions that provide for the installation of measuring instruments for limited periods of time, in order to determine the producibility of the site, are more and more frequently unproductive because statistically not representative of the wind regimes of the site. At the same time the spatial interpolation of wind data collected from monitoring stations at sites close to the one of interest is inefficient, especially in sites with very complex orography.

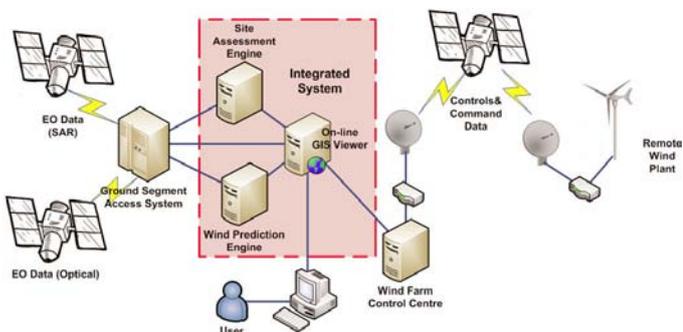
Wind interpolation techniques are not very suitable even on sea areas which, while not having the problem of orography, are characterized by a cover of wind data even much more sparse. Regarding this issue, recent studies have shown that SAR (Synthetic Aperture System) techniques can give an important contribution to the determination of wind fields over marine areas at the time of acquisition of the satellite.

SAR applications can be of great help also in determining the optimal site for on-shore plants, which are often located in mountainous areas, in areas at risk of landslide or subsidence, by evaluating the stability of the site carried out by the technique of PS (Persistent scatterers).

During the phase of analysis of wind regimes of the sites of interest, great advantages derive from the use of full-physics meteorological models, instead of single variable spatial in-



terpolation techniques, working at very high resolution. These models work on a three dimensional domain and, if appropriately configured on the area of interest, they are able to calculate wind values at various heights from the ground taking correctly into account subgrid-scale atmospheric processes (such as turbulent phenomena and flow over very steep obstacles).



Full-physics meteorological models are of fundamental importance even during the operational phase of a wind farm both for the aspects related to the maintenance schedules and for what concerns the prediction in the short term of the wind energy of the site and the subsequent insertion into the power network. Going beyond the need strictly related to wind energy power forecasting in the short term, wind predictability is considered moreover as a system design parameter linked to the resource assessment phase, where the aim is to take optimal decisions for the installation of a new wind farm.

On these subjects Planetek offers a wide range of services covering different phases of the realization, development and operation of a wind farm.

Such services can be used to validate the target site and the return of the investment before actually deploying the wind farm, and can be used to estimate the short term production or plan the maintenance activities.

All these needs can be well satisfied by Preciso Wind, a service jointly designed and provided by Planetek Italia Srl, Ecolab Srl and GAP Srl.

Find more details on www.planetek.it/preciso_wind

ASK THEM

Feel free to contact our experts for any information about B2B solutions.



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PRECISO® WIND

Preciso® wind services can be summarized as follows:

Assessment of site condition

- Preliminary study to define a synoptic view of the areas that are more suitable for installation of wind farms. This study will include information from various sources about orography, geomorphology, land use, identification of potential ground instability (performed using SAR data processed with the Persistent Scatterers technique), SAR analysis of sea waves integrated with the available buoy data. Moreover the service can include verification of absence of administrative constraints on the target area.

Assessment of site producibility

- Statistical study of the past meteorological conditions with particular reference to extreme conditions (severe weather events, lightning, extreme precipitation, snow, extreme temperatures...) which represent an important information for the user to the choice of the site.
- Preliminary study over different sites in a selected area through the use of full-physics meteorological and sea state models for reconstructing wind regimes over a statistically significant period of time. High-resolution diagnostic models are used. These information, integrated with the selected generator characteristics lead to a precise estimation of energy production, and the calculation of the returns of the investment.

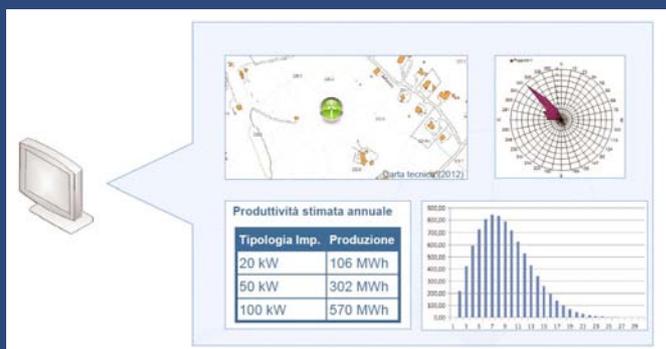
Production of enriched forecast

Daily service of hourly (or half - hourly) wind forecast with a very high resolution (1km to 100m) performed by the use of full-physics meteorological prognostic models. These models are properly configured and validated on the site of interest.

- Daily service of hourly (or half - hourly) atmospheric fields (up to 72h) characterizing the predicted meteorological conditions of the site.
- Daily service of hourly sea state forecast (up to 72h) with a very high resolution performed by the use of a chain modelling composed of full-physics meteorological and sea state prognostic models. This chain gives the user a complete and integrated vision of atmosphere and sea conditions.

These services will give a powerful tool to the user to take decisions about daily operational activities of the park regarding both the evaluation of the production of the wind power plant and the maintenance operations to be carried out.

Services can be, as usual, customized to seamlessly integrate the results into customer systems, or even include the direct delivery of production forecasts to energy authorities, giving a real contribute to help keeping greener our small planet.



SPACEPDP

WHERE **GEOSCIENCE** MEETS
IMAGINATION



On Board Payload Data Processing

Earth observation data processing from Earth to Space Segment

Matching the users application requirements with the more and more huge data streaming of the satellite missions is becoming very complex. But we need both of them!

To face both the data management (memory availability) and their transmission (band availability) many recent R&D activities are studying the right way to move the data processing from the ground segment to the space segment by the development of the so-called On-board Payload Data Processing (OPDP).

The space designer are trying to find new strategies to increase the on board computation capacity and its viability to overcome such limitations, memory and band, focusing the transmission of remote sensing information (not only data) towards their final use.

Some typical applications which can benefit of the on board payload data processing include the automatic control of a satellites constellation which can modify its scheduled acquisitions directly on-board and according to the information extracted from the just acquired data, increasing, for example, the capability of monitoring a specific objective (such as oil spills, illegal traffic) with a greater versatility than a traditional ground segment workflow.

On-Board Processing systems

We can count on a sound experience in design and development of open, modular and compact on-board processing systems.

Actually Planetek Italia is the prime contractor (together with Sitael S.p.A. and GAP s.r.l. as sub contractors) of an Italian Space Agency co-funded project, Space Payload Data Processing (SpacePDP) whose main objective is to develop an hardware and a software framework able to perform both the space mission standard tasks (sensors control, mass storage devices management, uplink and downlink) and the specific tasks required by each mission.

SpacePDP is an Open and modular Payload Data Processing

system, composed of Hardware and Software modules included a SDK.

The whole system is characterised by **flexible and customisable building blocks** that form the system architectures and by a very **easy way to be integrated in the missions** by the SDK (a development environment with encapsulated low-level drivers, HW support and testing environment). Furthermore Space PDP presents an advanced processing system to be fully adopted both as on-board module for EO spacecrafts and extra-planetary exploration rovers.

The **main innovative aspects** are:

- HW and SW modularity - scalability for the Payload Data Processing and AOC S/S
- Complex processing capabilities fully available on-board (on spacecrafts or rovers)
- Reduced effort in mission SW design, implementation, verification and validation tasks
- HW abstraction level comparable to present multi-tasking Unix-like systems allowing SW and algorithms re-use (also from available GIS applications).



The **development approach** addressed by SpacePDP is based both on the re-use and resources sharing with flexible elements adjustable to different missions and to different tasks within the same mission (e.g. shared between AOCS and data management S/S) and on a strong specialisation in the system elements that are designed to satisfy specific mission needs and specific technological innovations.



SpacePDP main characteristics:

- **Compactness:** size and weight of each module are fitted in a Eurocard 3U (100x160 mm²) format.
- **Modularity:** the Payload is usually composed by several sub-systems.
- **Flexibility:** coprocessor FPGA, on-board memory and support avionic protocols are flexible, allowing different modules customisation according to mission needs
- **Completeness:** the two core boards (CPU and Companion) are enough to obtain a first complete payload data processing system in a basic configuration.
- **Integrability:** The payload data processing system is open to accept custom modules to be connected on its open peripheral bus.

ASK THEM

Need more information? Feel free to contact Planetek Italia Space systems people in charge of this project.



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SpacePDP SYSTEM

The whole Space PDP system is composed of

- CPU HW module (one or more) based on a RISC processor (LEON2FT, a SPARC V8 architecture)
- DSP HW module (optional with more instances) based on a FPGA dedicated architecture
- Real time OS and SW libraries (with C/C++ external interfaces) acting as HW abstraction level
- SDK with a development environment, a toolchain and an integrated graphical user interface

SW Module

- Support Libraries for the execution platform (math, ...)
- Execution Platform (real time executive, tasks management...)
- HW functionalities encapsulation in low level drivers (C/C++ libraries).
- Devices memory mapping compliant to the RMAP standard inside the RTEMS tasks structure.
- "Callbacks" management and support to HW events (interrupts, timer, ...), including external devices (via Space Wire).
- Callbacks priority definition and management (compliant to RTEMS standard).

HW Module

- Open System with «Inter-Board» connection through cPCI peripheral bus
- High computation capability thank to the SPARC V8 CPU (80Mips @100MHz with LEON2) with companion DSP FPGA able to ensure an effective multitasking control and to offer high numerical computation.
- Large amount of volatile memory (SDRAM 256 MByte to 2.5 GByte with EDAC) and non-volatile (up to 1 MByte EEPROM)
- Remote programmability of the LEON bootable code
- Debug access point: for software debug and tuning with LEON serial port (DSU) or for «in flight» monitoring via SpaceWire-RMAP
- Each boards will be equipped with SpaceWire links for connection with on-board High Data Rate instrumentations, cross strapping, mass memory module and ground support equipments
- Complete remote control of system via SpaceWire RMAP including the CPU memory space
- Avionic control capability trough a redundant MIL-STD-1553 bus (RT/BC) or CAN bus (or CANopen)





Satellite Ground Segment

Software infrastructures development for the management, acquisition, processing and archiving of satellite data

In the most current sense and for the recently launched satellite platforms, the Satellite Ground Segment performs the whole operational data management of the acquired data. This comprises well-known functions such as reception, systematic and on-demand processing, archiving and cataloguing, ordering and dissemination of digital satellite products.

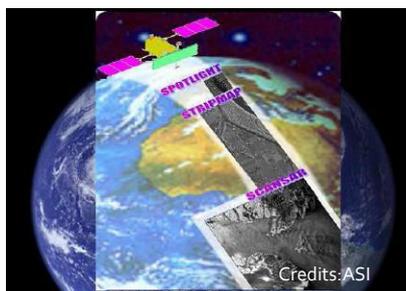
In addition, it comprises new functions like large-scale multi-mode acquisition ordering by users, integration with a commercial service segment, and new interfaces and workflows within the complete ground segment.

Within European and Italian Space Agency Earth Observation Programmes, Planetek Italia is involved in many activities focused on the design, development and implementation of more than one part of specific Mission Ground Segment architectures.

A very short description of the main EO programmes Planetek Italia is involved to is shown below.

COSMO-SkyMED Performance Estimator (COSMO PE)

Whithin the COSMO-SkyMed Mission Planning and Control Centre (CPCM), Planetek Italia developed the Performance Estimator module for the settings of satellites acquisitions parameters. The automatic and manual setting tool allows the selection of the setting parameters (such as Pulse Repetition Frequency, Sampling Window Start Time, Chirp duration) and performance parameters (such as Range resolution, Data rate, Azimuth resolution) useful to fulfil the user performance requirements. The Cosmo Performance Estimator is a subsystem designed, tailored and realised for the CosmoSkyMed mission instruments, but it can be easily adapted to other radar satellite missions in order to im-



prove the acquisition planning according to the operator requirements.

http://www.planetek.it/eng/projects/cosmo_pe

COSMO-SkyMed Mosaicking Processor (COSMOSAIC) is a project of Cosmo-SkyMed UGS (User Ground Segment) Program, that defines and implements the mosaicking processor for SAR (1B - Detected Ground Multi-look product, 1C - Geocoded product GEC, and 1D - Geocoded product GTC products) and DEM images acquired by the Cosmo-SkyMed satellite platform. The processor performs a coregistration to remove coarse errors from the images and then applies the mosaicking of SAR images or DEM into a common grid, in order to generate large scale "Mosaicked Products".

<http://www.planetek.it/eng/projects/cosmosaic>

PRISMA (Hyperspectral Precursor of the Application Mission) is an ongoing Italian Space Agency EO mission with innovative electro-optical instrumentation that combines an hyperspectral sensor with a medium-resolution panchromatic camera.

The main PRISMA objectives are:

- to develop a small mission entirely in Italy for monitoring of natural resources and atmosphere characteristics
- to make available in a short period of time the data necessary to the scientific community for developing new applications for environmental risk management and observation of the territory
- to test the hyperspectral payload in orbit - the first or among the first at the European level.

Planetek Italia has the responsibility for the design and development of the **full automatic geocoding sub-system under the Ground Space Segment**. This S\S takes in input products of level 1 and produces geolocated and geocoded products of level 2.

<http://www.planetek.it/eng/projects/prisma>

DREAM (Decision Support and Real Time EO Data Management) is an ESA project that addresses the technology, architecture and G/S interfaces needed to streamline the planning, ordering and access to ESA and Third Party Mission Earth Observation for two identified institutions: i.e. EMSA (European Maritime Safety Agency) and EUSC (European Union Satellite Center). These two institutions are considered reference users of the project which shall as well consider uses cases from GMES.

The overall system addresses the issues which arise when a decision process needs to exploit information based on EO data, both on long term planned scenarios and on specific events.

Planetek Italia is responsible for the analysis, design and development of the Reference Coverage Server sub-system. This S/S has the role to automatically build and update (and provide to users) the best "reference coverage", selecting data covering specific areas of interest (as well as the entire globe) among all the available Sentinel-2 data. Selection of data will specifically take into account users' needs, such as absence of clouds, update frequency, other quality factors or peculiar conditions (viewing angle, sun angle). Our reference user is EUSC.

Multi Mission National Centre (CNM)

One of the main Italian Space Agency objective is to share information (Data, Products and Services) coming from different Earth Observation Missions to be used by EO community. Planetek, together with other Italian partners, designed and implemented the Multi Mission National Centre focused on the management of the ASI Earth Observation data asset, that is data acquired by heterogeneous sensors and arisen from various missions.

The CNM main functions are:

- EO data acquisition, storage, catalogue & processing
- Data and services distribution
- Users management
- Data, metadata and related documentation handling.

Planetek Italia is responsible for the design and development of some User Interface Sub-System components:

- HDE - Help Desk Environment
- ONF - OnLine Navigation Facility
- USM - User Manager.

<http://www.planetek.it/eng/projects/cnm>

ASK THEM

Need more information? Feel free to contact Planetek Italia Space systems people in charge of this project.



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The Space team's capabilities

Planetek Italia has a sound experience in the definition and implementation of **Software for Space Systems** for Earth Observation and Planetary missions, such as ERS, Envisat, COSMO-SkyMED, Mars Express, Mars Reconnaissance Orbiter and Cassini Huygens.

Planetek Italia develops software for payload operations, including control and image/data processing.



The Space team's capabilities range from the system definition, the design and development, to the validation and the on-site delivery.

Planetek Italia provides "Ground Segment" systems and technologies to receive and process satellite data acquired by the spacecrafts instruments to archive, disseminate, publish and share the generated products as well as engineering consulting services for new missions definition, feasibility studies, ground control system architecture definition, requirements specification and design.

Its sound knowledge in ground segment sector makes the company one of the main Italian designer, developer and provider of the following software applications domains:

Mission and Control Centre

- Mission planning and performance monitoring systems
- Data handling, payload control, data storage
- Real-time systems

Ground and User Segment

- Radar and optical data archiving and processing
- Product ordering, data catalogue navigation, on-line product navigation
- Data dissemination
- Data Fusion



Easy management and access to Planetary Data

Supporting the National and International industrial and scientific stakeholders involved in planetary exploration by providing the right tools to manage, access and analyse Planetary data

Mars is one of the most interesting planets for many satellite missions aimed to retrieve the surface and sub surface data for the reconstruction of elevation profile and for the mapping of subsurface water and identification of geological structures.

Planetary exploration by means of radar systems, mainly Ground Penetrating Radars (GPR), is an important sector also for the Italian scientific and industry communities: three important experiments under Italian leadership provided by ASI within a NASA/ESA/ASI joint venture framework are successfully operating and now entered in a second extension phase (up to 2014):

- MARSIS on-board Mars Express
- SHARAD on-board Mars Reconnaissance Orbiter
- CASSINI Radar on-board Cassini spacecraft

SHOC, MOC and CASSINI PAD - respectively for MARSIS within ESA Mars Express mission, SHARAD within Mars Reconnaissance Orbiter mission and CASSINI within NASA, ESA, ASI Cassini-Huygens mission - are three centres dedicated to a single management and control tool, data processing and distribution.

They have been operating from the start of the missions to support all the scientific communities, institutional customers and experiment teams operations. The three centres ensure the production and delivery of products in the standard PDS (Planetary Data Science) format.

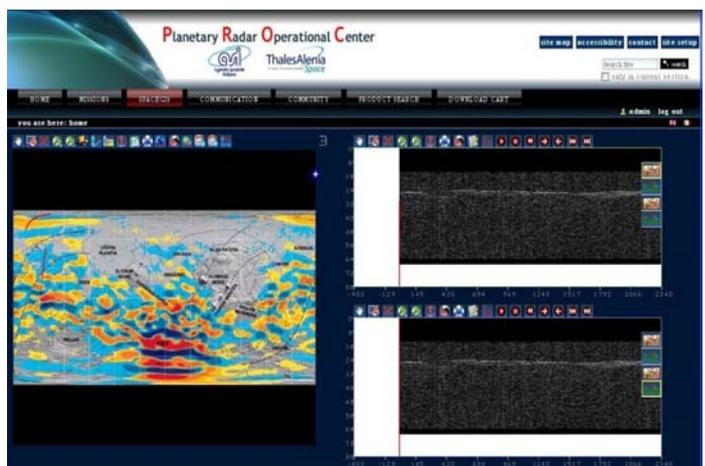
Although the three centres had been conceived to operate independently from each other, the need to have a joint data mission analysis aimed to arise the informative content envisaged. So, the Italian Space Agency started the Planetary Radar Processing Center (PROC) programme aimed to set up the a single point of access to the aforesaid mission data.

The Planetary centre is designed and developed to increase

capabilities - in terms of data storage, comparison, interpretation and exploitation - providing added value products and processing capability to support the scientific community for ongoing and future Italian planetary exploration programmes, such as Europa-Jupiter System Mission (EJSM) and stratospheric and avionic ones.

Planetek Italia, in cooperation with Thales Alenia Space Italy (prime contractor), University of Roma Tor Vergata and IFSI/INAF, the Italian subject in charge of scientific activities, has been involved in the project.

In this project, Planetek Italia exploited its knowhow and background gained during its previous Planetary Exploration activities, such as Moon WebGIS, that is the precursor of SpaceGIS aimed to deliver Moon data (acquired by Clementine space mission) in a friendly, innovative and reliable way and PAGIS (Planetary Geosciences Information System) an ASI funded study that provides a reliable tool to the scientific community for the storage and analysis of data sets and geoscientific products in a unique Geographical Information System environment.



PROC reference scenario: Spatial Data Infrastructure

The PROC system is structured like an SDI (Spatial Data Infrastructure), which allows to automatically catalogue and archive standard scientific products (in PDS format) and to deliver them on the Internet, according to OGC standards, after a conversion in JPEG2000 format.

Once processed by the different operational centres SHOC, MOC and C-PAD, the data are catalogued, converted and stored in the PROC dissemination system. Then, the administrator decides whether to publish such data on the web, and activates OGC services, such as WMS, WFS, WCS, WMC and GeoRSS. So the published data are accessible to the scientific community (which can also download them for further analysis with dedicated tools) and to the public as well.

In addition to the typical spatial data, the system editors (which also include scientists) can write and publish articles, diagrams, scientific analyses, videos and anything else that populates the portal.

The used technologies are the best of FOSS (Plone, PostGIS and GeoServer) and commercial (ERDAS Image Web Server) ones.

Future exploration

PROC is a first step towards the adoption of a Spatial Data Infrastructure for planetary data. This innovative approach aims to better exploit the new planetary missions investments by extracting major informative content from the retrieved space data.

The idea of having a single access point for multi mission data provides a strategic opportunity to improve the different space data management. To this purpose, PROC adaptability allows to customise the system architecture according the different EO or planetary missions. The straightway evolution is the inclusion of the future mission EJSM (Europa Jupiter System Mission), one of the major joint European Space Agency and NASA missions in the Solar System currently under study, into the PROC System.

Through this work, the Italian Space Agency (ASI), in cooperation with its project partners, has disseminated the space missions instruments potentiality by allowing also common people the access to high value space products; on the other hand, it has provided scientists with a tool that facilitates and encourages academic operations and debate.

ASK THEM

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PROC Architecture

PROC Logic Architecture has three different areas:

- A scientific area for data analysis and mission products extraction
- A backup and archive area
- An internet area for the products dissemination and for the distribution of scientific documents related to the three PROC's missions.

Data Management subsystem

This subsystem is the link between SHOC, MOC and C-PAD Operations Centres, and allows the cataloguing, management, conversion, publication of the Centres data.

The Back Office subsystem

This subsystem manages the whole information editing processes.

The main Back Office subsystem features are listed below:

- Web-based environment work directly accessible by an Internet browser
- Content Management (pdf document, word, movies, etc.) through WYSIWYG interfaces
- Users management
- Workflow system management
- Multi-Language both for the interface and for the web portal contents.

One of the most important aspects of the whole PROC architecture is its adaptability and expandability to the future Deep Space mission, that is its capability to be tailored to every kind of mission by setting the relevant mission's parameters.

PROC Web Portal (www.asi-proc.it)

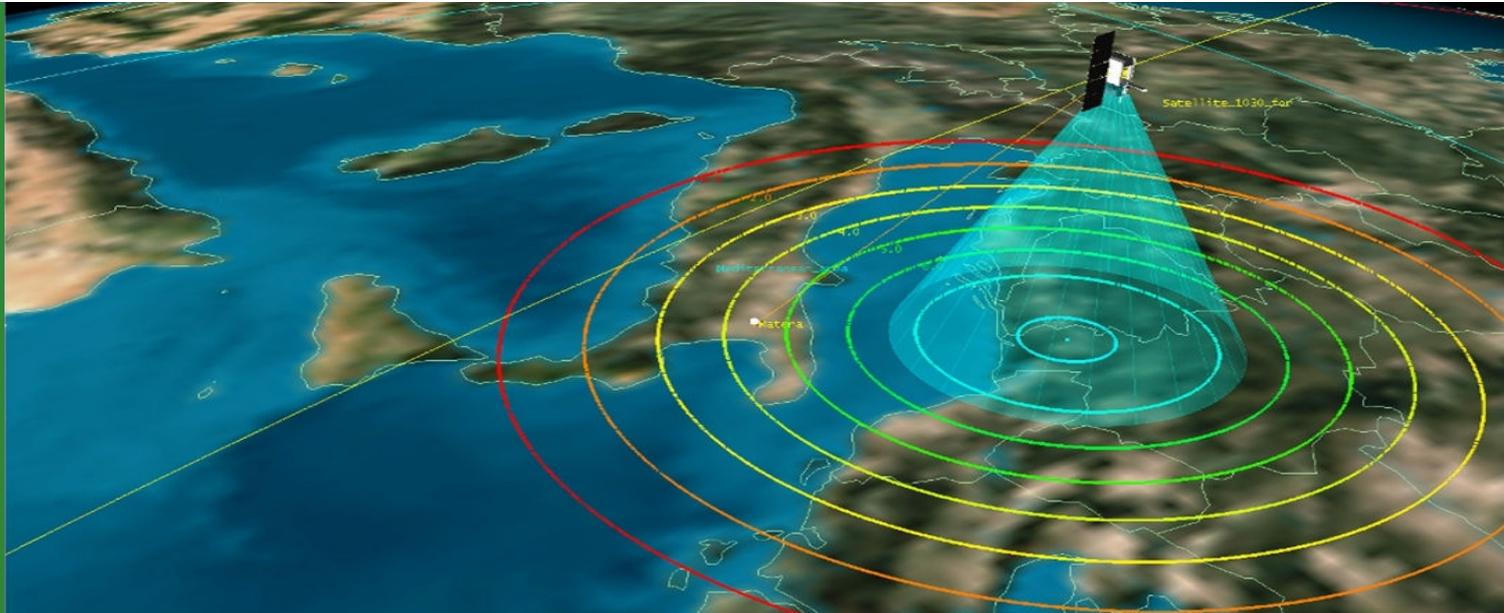
The PROC Web Portal is a mass dissemination tool of SHARAD, MARSIS and CASSINI data missions whose main goals are:

- allowing general Internet users to get access to information, contents, data and news related to the three missions data and to all the related activities;
- supplying tools and services for the scientific community in which interactive maps and radargrams are supported by the innovative SpaceGIS web tool;

The SpaceGIS web application allows the on-line navigation to search both cartographic planetary data (Mars, Titan and even other planets like the Earth) and subsurface radargram data.

ensuring controlled access to the portal by means of an appropriate authentication mechanism as well as data integrity and availability.





SHIRA The first Italian user oriented satellite

A new HR TIR satellite mission combines the user needs by a Data Fusion Centre that supports the Regional Authorities in the environmental and security activities.

Today, small satellites are changing the economics of Space. These spacecrafts embrace cutting edge COTS technology, permitting innovative and less expensive ways to perform meaningful observation missions. SAR as well as hyperspectral imaging missions on minisatellites are currently operating or planned. A major challenge for high resolution imaging missions or for hyperspectral missions on small spacecraft is the thermal stability on the imaging instrument and bus - to provide sharp imagery.

In the early 21st century, the spectrum of microsatellite services is by all means as impressive as that of their bigger broche satellites, but at considerably reduced costs. Microsatellites make it possible to open up new fields of services, previously considered too expensive. As a consequence, all space agencies and military establishments of the world have been (or are) re-evaluating their programmes, in favour of smaller systems, to offer a solution for ever tighter budgets.

Another important aspect focuses on the need to cover as much as possible the whole frequency spectrum, especially the section that is neglected by most of the satellite missions, that is the thermal infrared band.

The above needs derive from an explicit users request of having products and services in environmental and security application fields with highly detailed informative content.

The users' needs, translated into technical requirements, led to start and define research activities focused on the study and preliminary design of High Resolution Thermal Infrared new satellite mission.

So, the new trend of small satellites and the need to have user oriented missions led Planetek Italia and other four Apulian Space companies to start the SHIRA project. SHIRA main strategic objectives are:

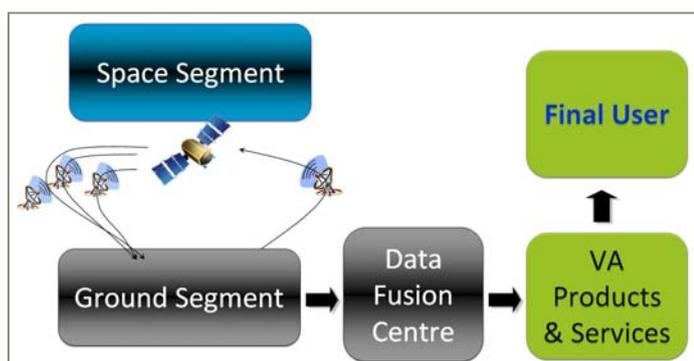
- To collect and distribute data from in-space optical sensors at infrared band, at high-resolution
- To develop a set of sustainable services for regional and national institutions
- To market a set of product resulted from this mission and in combining with other Italian (COSMO-SkyMed) and international missions worldwide
- To contribute to environmental European programmes (e.g. GMES) from core services (via standard products) to downstream services (via high level products).

SHIRA main technical objectives are to Study a Thermal Infrared High Resolution Satellite and to Design a Data Fusion Centre (DFC).

The whole SHIRA design approach is based on the actual users' needs in terms of application fields, in order to overcome the currently existing gaps between the current satellite technologies and the Value Added products and services required by the final users.

So the study of the Thermal Infrared HR Satellite is based on the following main activities:

- User involvement in the design lifecycle to collect requirements and to better define applications
- Technical and economical mission feasibility and sustainability study



- Definition of mission elements (orbit and space segment, launch segment, GS, communication and control, etc)
- Study of thermal infrared sensors for medium and high resolution and assessment of platform in the Space Segment
- Assessment of the Mission Control Segment and analysis of User Segment (Ground Segment).

The Data Fusion Centre will be the single regional data fusion and integration centre for multimission and multi-sensor products from spaceborne, airborne and onsite data. The DFC centre study is focused on the user driven approach and it is based on the following activities:

- Analysis of service-related users' needs to define economically and technically sustainable solutions.
- Design, trade-off analysis and development of prototypical algorithms for data fusion (looking for strong synergy with Universities and Research Centers).
- Prototypal product and service validation with support of public and private operators in the Environmental and Civil Protection sectors.

The project duration is 24 months and it is entirely promoted and implemented by a consortium of Apulian companies with a consolidated experience in the field of Earth Observation: Planetek Italia s.r.l., Mer Mec S.p.A., Sitael S.p.A., VVN s.r.l. and IMT s.r.l.



SHIRA program is co-funded by Puglia Region within the framework: PO FESR 2007 - 2013 - Asse VI - Linea di Intervento 6.1 - Azione 6.1.1; Asse I Linee di Intervento 1.1 - Azione 1.1. - Determinazione n. 590/08 - Avviso per l'erogazione di "Aiuti ai programmi di investimento promossi da Grandi Imprese da concedere attraverso Contratti di Programma Regionali".

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SHIRA PAYLOAD

SHIRA payload is an innovative electro-optical instrumentation, that integrates a Panchromatic Camera with a Hyperspectral Sensor, performing a real-time capture of EO images in the frequency range from Infrared up to Thermal Infrared.

SHIRA Payload main innovations:

- Medium and High Resolution Images in the [3um - 14um] BandWidth
 - Combination of geometric characteristics with the chemical and physical composition.
 - Perform Frequency Discrimination during Image Acquisition Phase
- Prototype Specification (*preliminary*)
- IR Bandwidth: 3.0 um ÷ 14.0 um
 - Number of samples across-track: 800
 - Number of active spectral channels: 60 ÷ 120
 - Spectral Resolution: 50 nm ÷ 120 nm
 - Resolution on the ground (@1 km height): 0.5 m ÷ 1 m
 - Focusing Optics: Reflecting telescope
 - Bit-depth: 10-14 bits

FROM SPACE TO USERS

Land/Solid Earth Applications

- Earthquakes
- Coal mine fires
- Water stress, Evapotranspiration
- Growing Degree Days
- Waste monitoring
- Volcano and Fire monitoring

Archeology applications

- Historical building
- Excavation site

Health & Hazards Applications

- Urban Heat Island
- Industrial risks
- Oil spill
- Diseases
- Asbestos-cement detection
- Energy efficiency
- CO₂ monitoring

Security & Surveillance Applications

- Border security
- Object monitoring and detection
- Minefields and landmines detection
- Industrial and power plant monitoring
- Trafficability



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The Newsletter

For more than a decade Planetek Italia has been sending its newsletter in two languages (Italian & English) to more than 15.000 subscribers. With this channel you can find company news or information about the main projects and the latest technologies or solutions, events in the geospatial and in land management, GIS and Remote Sensing sector.
<http://www.planetek.it/user/register>



Website News through Feed RSS

All the news, the events, the new projects the resources published on the website in your News Aggregator: news, events, courses, project and application papers, products, new GeoXperience Magazine issues.
http://www.planetek.it/rss_feed_eng



The Blog

An open space where our managing directors and our professionals publish articles about main and fundamental issues in the Geospatial world. An interactive environment where anybody is free to say his opinion and share his knowledge. The blog has a RSS Feed service.
<http://blog.planetek.it>



Geospatial News blog

All the news from Intergraph | ERDAS world. News and upgrades about the products, *videotutorials* to learn tips & tricks and how to use products, ERDAS webinars, product and applications papers, events and other useful info.
<http://geospatialnews.planetek.it>



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Twitter

Twitter is, with no doubt, an emerging social platform. Thanks to its immediate and clean approach twitter is perfect for a mobile use. Twitter is often chosen by professionals users who want to create a community and share ideas and thoughts.
<http://twitter.com/planetek>



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Video-tutorials, Interviews, Video-Courses, VideoReports from workshop and events. Through this channel we broadcast and share some of our knowledge.
www.youtube.com/planetekitalia
<http://vimeo.com/planetek>



LinkedIn

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GeoXperience Archive

Explore more projects and histories on the previous issues of the magazine available on-line at:
<http://www.planetek.it/geoxperience>



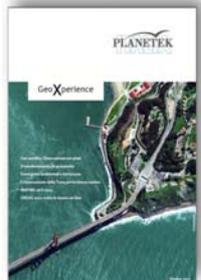
Giugno 2012

Planetek Italia: la nuova organizzazione;
Gli Open Data Geografici;
Smartcities e Smartmobility;
GMES Initial Operations;
Planetek & Intergraph: tutte le novità;
Cart@net 2012;
Inserito: Speciale PRECISO®



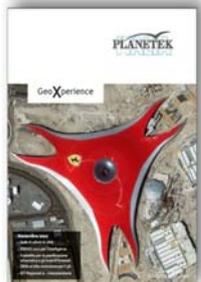
Novembre 2011

Il Geoportale europeo di INSPIRE
Il Geoportale dell'Emilia Romagna
GMES ed il monitoraggio territoriale
Architetture di bordo del XXI secolo
Intergraph e ERDAS
L'uso dei dati LiDAR
Impariamo a prevenire le frane
Inserito: Speciale PRECISO®



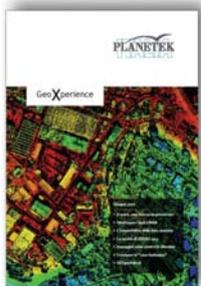
Giugno 2011

I dati di osservazione della Terra per la pianificazione urbanistica
Il Telerilevamento di prossimità
Modelli innovativi di acquisizione dati per superare la burocrazia
La salvaguardia delle risorse marine
La viticoltura di precisione
Strumenti per INSPIRE in riuso
Il corso di formazione "INSPIRE per la realtà italiana"
Le novità ERDAS per il 2011 e tutte le risorse per l'auto-formazione on-line.



Novembre 2010

Isole di calore in città
ERDAS 2011 per l'intelligence
Il satellite per la pianificazione urbanistica
L'osservazione della Terra per la perimetrazione degli incendi nelle foreste
La costellazione Pleiades per l'osservazione della Terra
DEM ad alta risoluzione per il 3D
Le Infrastrutture di Dati Regionali
Il Planetary Radar Operation Center



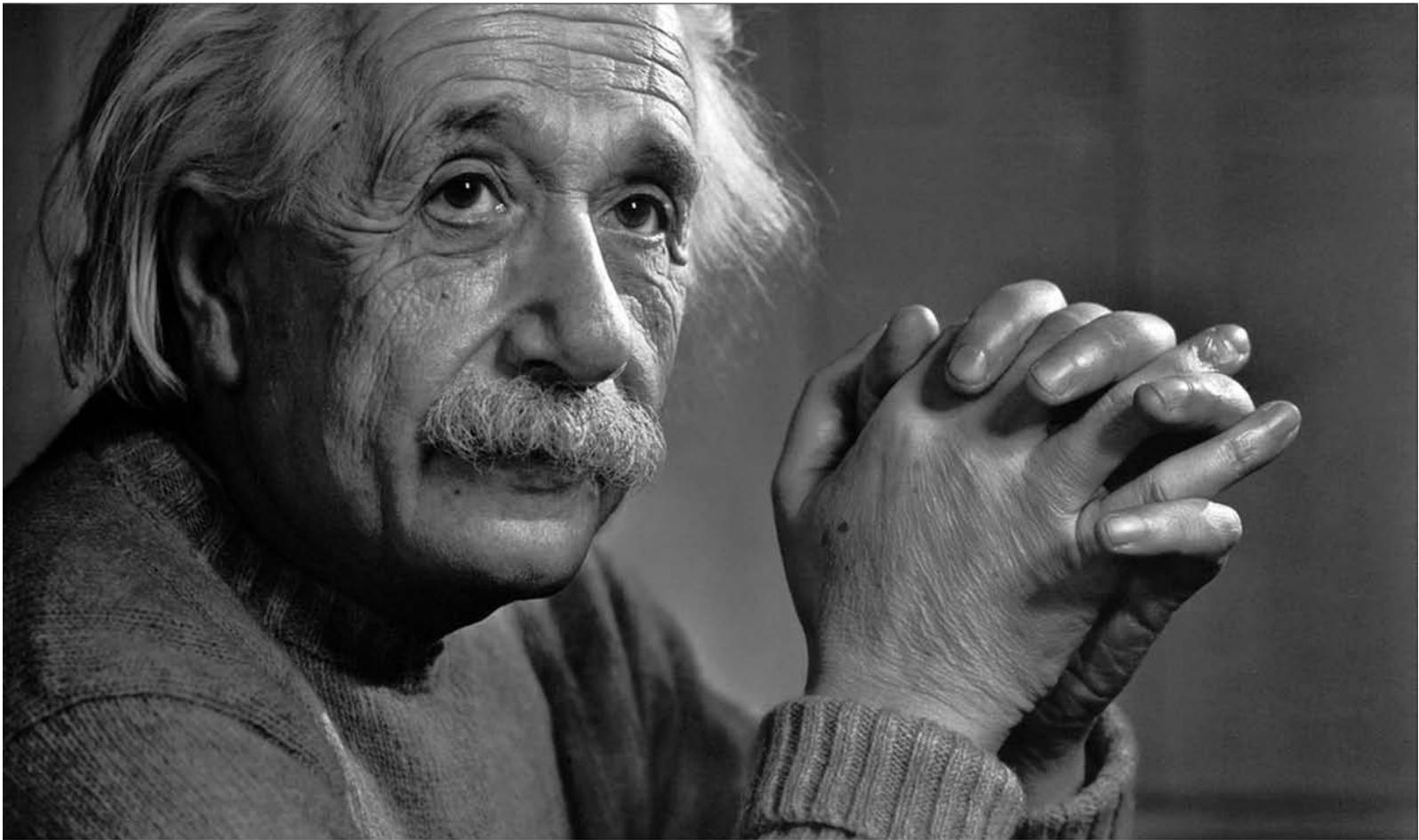
Giugno 2010

L'osservazione della Terra per le applicazioni marine e costiere
I dati LiDAR e la gestione delle nuvole di punti
La linea di prodotti Preciso®
Scoprire le "case fantasma": i dati da satellite per il controllo del territorio
Il catalogo dei dati open standard in Italia: GEOportale.it
Le novità di ERDAS 10.1
Le immagini radar per le alluvioni
I satelliti TerraSAR-X e TanDEM-X.



Novembre 2009

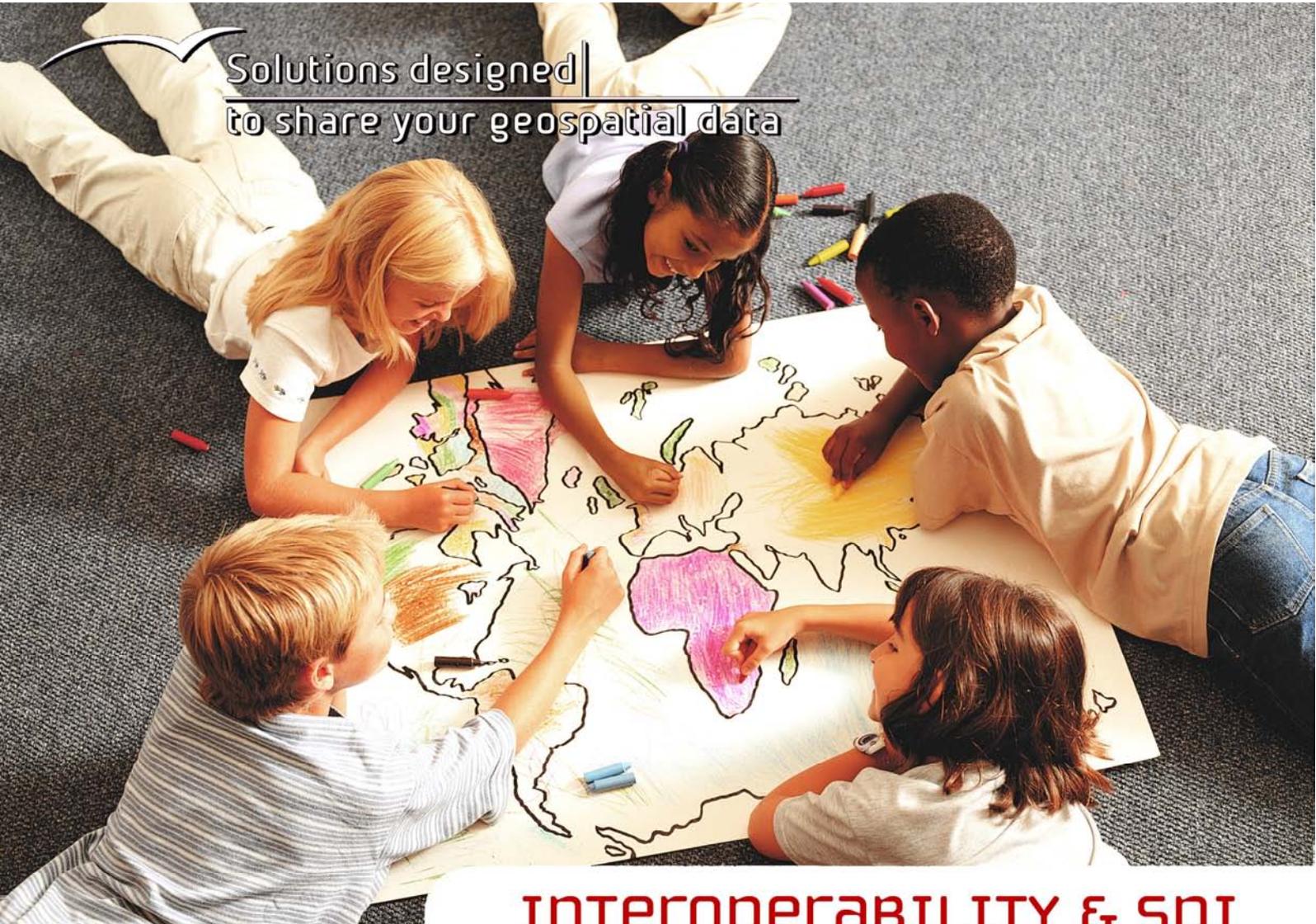
L'Uso del Suolo e l'Urban Atlas HR
Il monitoraggio dei fenomeni franosi
Il WISE ed i sistemi di gestione delle risorse idriche
A cosa servono le immagini RADAR
Il Valore Aggiunto sui dati telerilevati
La nuova faccia di ERDAS IMAGINE 2010
ERDAS APOLLO: interoperabilità e Geo-processing
Cart@net: banche dati cartografiche on-line e CMS geografici.



Insanity is doing the same thing over and over again
and expecting different results.

Albert Einstein

Solutions designed
to share your geospatial data



INTEROPERABILITY & SDI

Imagine your future, find our experience

Working with an expert can make the difference in order to bring to success large projects, that include the design and development of enterprise data sharing solutions. Planetek Italia provides solutions for your Spatial Data Infrastructures (SDI) implementation and integration, compliant with OGC and ISO standards, and with INSPIRE implementing rules. Robust and reliable technologies, great expertise, consolidated experience, and care for user needs are well blended to drive your applications towards the future.

SOLUTIONS for INSPIRE

Products and Services

Services

- Spatial Data Infrastructures & Geoportals
- Coaching for SDI implementation
- Metadata catalogues implementation
- Data transformation according to INSPIRE data specification
- Consultancy for Legacy Infrastructure integration and reuse
- Open Source software integration
- Training and education services

Products

- Cart@net@: content management system for Geoportals
- ERDAS APOLLO@: SDI out of the box

Planetek Italia is an OGC Associate Member and is registered as SDIC in the INSPIRE Geoportal



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