L'*e*-Informa by the National User Forum

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News

Italian Space Economy Strategic Plan: new growth and development opportunities explored through Space

The Italian Space Economy strategic plan is the result of a dedicated working group acting in the framework of the "Cabina di Regia Spazio", an initiative promoted by the Presidency of Council of Ministers, in collaboration with the Conference of Regions and Autonomous Provinces, with the aim of defining the most suitable strategic intervention lines, for transforming the national Space activities in one of the "engine" of growth for the Country.

Space Economy Conference, Rome
http://www.sviluppoeconomico.gov.it)

The Plan represents a first implemtation relative to Space, within the National Strategy for Smart Specialisation, approved by the European Commission in response to the request of programming structural funds on the basis of a unique integrated strategy, from research to production. The collection and the integration of all the elements for the drafting of the Plan has been entrusted to the Ministry for Economic Development (MiSE) by the Government. In this task MiSE has operated in strict collaboration with the Conference of Regions and Autonomous Provinces. The main institutional actors of public policies concerned with spatial acitivities, anyway usable in terms of development have been involved in the process: the Italian Space Agency, ISPRA, CNR, INFN, the Civil Protection Department, the Ministry of Infrastructure and Transport, the Ministry of Defense, the Ministry of Foreign Affairs and International Cooperation, as well as the regional administrations. The strategic vision of the Space Economy is to activate the transformational process of spatial activities in engine of growth for cross related and no-spatial activities such as the extension of Space related benefits to the entire society. The Italian Space Economy strategic plan paves a transitional way from the Space Industry to the new Space Economy, that is to a new sustainable Space policy which considers a country investment in innovative enabling infrastrucures in five years. The investment is organized around six national intervention priority lines: the national program for satellite telecommunications (SATCOM); the national support program to Galileo (Galileo Mirror Program); the program for the realization of the national PRS infrastructure; the national support program to Copernicus (Copernicus Mirror Program); the national support program to the SST initiative and the national support program for the development of the space technologies and exploration. With resolution n. 25/2016 published by the Official Gazette of the italian Republic last November 14 (GU Serie Generale n.266 del 14-11-2016), the Interministerial Economic Planning Committee (CIPE) has funded a first group of initiatives of a more immediate implementation with a 360 bilion euro initial Fund under the Cohesion and Development Fund in the frame of the FSC action plan "Business and Competitiveness". It is an "initial" endowment of the Plan which activates an investment of about EUR 1.3 billion, including the contribution provided by the Regions in respect of european structural funds. In particular, the two Mirror Programs aim at enhancing the italian participation to Galileo and Copernicus Programmes which are considered to be the two main development levers of european Space Economy for the national industry and business. The Space Economy paradigm is based on the idea of developing a unique value chain connecting and extending the Upstream segment (the implementation of european and national infrastructures for earth observation) to the so called Downstream segment (downstream services at local and regional level). In a few words, the transition to the Space Economy, corresponds to a change of vision which considers first the implementation of non – spatial technologies and infrastructures enabling a portion of the national market and then the achievement of an effective realization of geospatial services also through the upstream segment. To Know more


Minister Carlo Calenda
http://www.sviluppoeconomico.gov.it

ASI and ISPRA together for Habitat Mapping and Air Quality: the Extended Collaborative is launched

Data sensed by Sentinels, those by national missions such as COSMO-SkyMed and the products of the Core Copernicus services represent a unique data base for the development of Earth Observation services and complex computations useful to daily monitoring of the health status of Italy and the Mediterranean, providing information to citizens, businesses and governments.

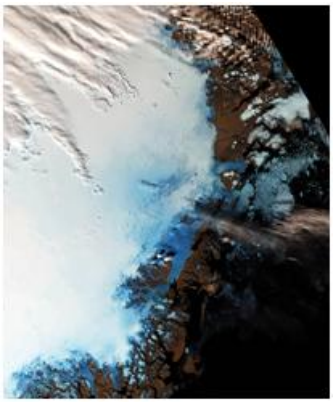
The Italian Space Agency (ASI) and the Italian Institute for Environmental Protection and Research (ISPRA) have agreed to cooperate and to pool their infrastructure, knowledge and experience to achieve the first two services of the Italian Extended Collaborative Ground Segment.

The Extended Collaborative is the national platform based on "big data" technology that will collect the different data sources, so extensive in terms of volume, velocity and variety, to require specific technologies and analytical methods for the extraction of value, useful to develop geo-spatial applications and services. This platform will be the basis of the Mirror Copernicus program.

Under the existing framework agreement between the two institutions, two projects, namely "Collaborative Platform Topics Sentinel GS for Habitat Mapping" and the "Collaborative Platform Topics Sentinel GS for Air Quality" have been developed. Both projects aim at creating high technology operational infrastructure and generating products and services for the protection and environmental conservation in support of the National System of Environmental Agencies (SNPA). Both platforms use the European and national satellite data (missions Sentinel 1.2 and 3, Cosmo SkyMed and Prisma), the products offered by Copernicus services (in particular the Copernicus Atmospheric Monitoring Service and the Copernicus Land Monitoring Service), the data acquired from in situ sensors, ancillary geo-spatial information and forecasting models. The service dedicated to Habitat Mapping intends to produce and distribute thematic maps (maps of Habitat, maps of soil consumption, land cover maps, river morphology maps, etc ...). In May 2011 the European Commission adopted a new strategy which sets an EU implementation framework for the next decade in terms of environmental policies. The stated goal is to halt the loss of biodiversity in the EU by 2020 and to protect, assess and restore biodiversity and ecosystem services by 2050. The satellite can give an important contribution to achieve these ambitious and challenging objectives, and the project for the Habitat Mapping intends to be a key tool to support the control actions related to this law.

The Air Quality service intends to provide evaluation and forecasting of air quality throughout the country, also supporting the SNPA system. Thanks to this service, will be produced regularly the initial and boundary conditions for regional and local models used by regional agencies for the assessment and prediction of air quality.

Sentinel 3A watches our Earth's oceans



Greenland Changing ice - first earth color data from sentinel 3A : http://www.esa.int

The main objective of Sentinel 3A mission, third satellite of Copernicus Programme is to measure sea surface topography, sea and land surface temperature, and ocean and land surface color with high accuracy and reliability supporting ocean forecasting systems and environmental and climate monitoring. On the basis of Envisat and the innovative CryoSat, Sentinel 3A sensors measure ocean properties by studying changes in water temperature and in surface height and provides a set of information essential for maritime security as well as a crucial service to forecast floods and tsunami. This polyhedric satellite also provides every type of map in topographic environments. It measures medium

levels of ice extension and monitors height of sea, lake and river waters, sea water quality and marine pollution. Sentinel 3A orbit insertion is for scientists an unprecedented step forward in Copernicus Programme Services and crucial for the study of climate changes.

Telescope

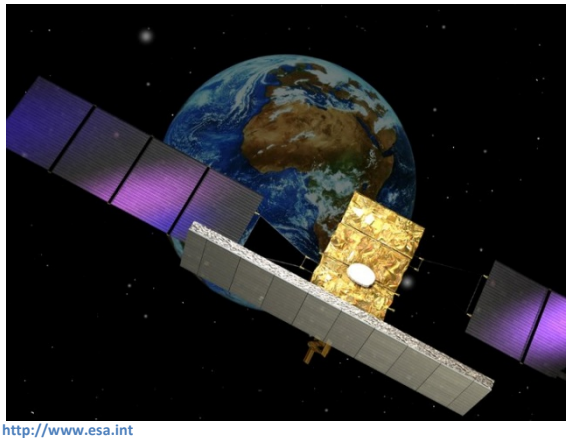
Land consumption monitoring with Sentinel images

The national land consumption monitoring project is under the responsibility of the National System for Environmental Protection (SNPA). The aim is to monitor land cover changes due to artificial areas growth (residential, infrastructures, commercial, etc.) and the resulting impacts on soil, with the loss of a basic non-renewable environmental resource. ISPRA and several Regional Environmental Protection Agencies (ARPA/APPA) took part in 2016 monitoring through the establishment of a National Reference Network for Land Monitoring and Land Consumption Monitoring. A new shared methodology was defined by the working group to use, for the first time, new Copernicus Sentinel images at national level. The project integrates Remote Sensing and the Geographic Information System tools to analyze and classify with a semi-automatic approach Sentinel 2-A images referred to 2016, in order to find new artificial areas.

Land Consumption Monitoring (orange: land consumption until 2015; violet: changes between 2015 and 2016; background: Sentinel-2A)

The spatial and temporal resolution of Sentinels, gives the possibility to build a multi-temporal analysis with a seasonal trend and to identify main changes and land consumption phenomena (urban expansion, new road network, construction sites, etc.). Through an overlay analysis between 2015 map of land consumption and the new results derived from Sentinel images classification, SNPA will update indicators on land consumption rates and trends of the national report to be published in 2017.

COSMO-SkyMed in Copernicus



http://www.esa.int

The Synthetic Aperture Radar COSMO-SkyMed (CSK) Constellation, since 2010, is one of the main Copernicus (GMES) contributing missions; currently, data provision is carried out by eGEOS, an ASI-Telespazio S.p.A. joint venture, which provides the Copernicus Programme with a 24 h/7 days Service Desk. http://www.esa.int/Our_Activities/Observing_the_Earth/Copernicus/SAR_missions).This Service plays a fundamental role in optimizing the use of the Italian Constellation, which is composed of four identical SAR satellites and is characterized by a twice a day, 365 days a year mission planning. eGEOS developed all the required and necessary interfaces to submit and manage orders and let the users appropriately browse the mission archive

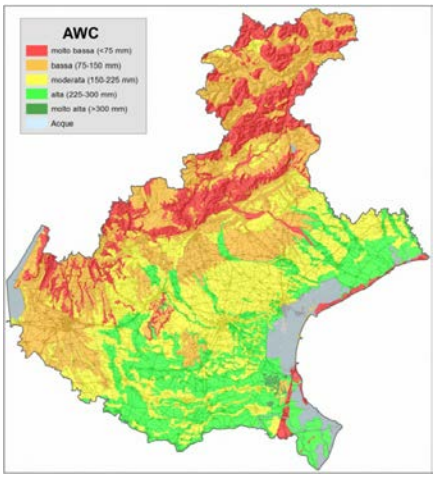
(COSMO-SkyMed catalogue can be accessed by Copernicus users directly through the ESA EOLI-SA application). The Copernicus Sea Ice Monitoring CORE Dataset is the main user of the COSMO-SkyMed System data for ice monitoring in Arctic regions (i.e. Baltic Sea, North Sea, Arctic Sea), Greenland coasts and Antarctica. Processing and distributing the required images in a very short time, is mandatory for having a real effective and beneficial service and, if required, eGEOS can provide data within 1 hour from satellite sensor acquisition. This thanks to the realization of "ad hoc" light programming/receiving ground stations (CUT – Commercial User Terminal), such as the Finland CUT which plays a very special role in Arctic acquisitions. Other Copernicus services, such as the Emergency Management Service

Flood map generated by Copernicus EMS using a COSMO-SkyMed image

(EMS, http://emergency.copernicus.eu/) make use of COSMO-SkyMed data during flood emergencies and wherever SAR data plays a leading role with respect to optical sensors, e.g. all weather day/night acquisitions capability.

Success Stories

What kind of soils have been consumed in Veneto Region between 2012 and 2015?



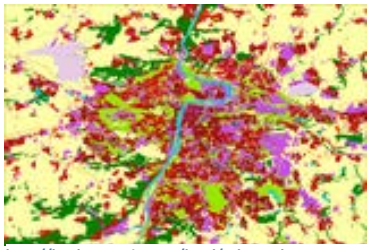
AWC Soil map of Veneto Region - Arpa Veneto

In the last three years, 2012-2015, in the Veneto Region about 1,400 ha of soil were consumed, (equal to 0.08% of the regional territory). Estimates, based on Copernicus data processed by ISPRA for the year 2015, were smaller than the increases estimated previously with other data sources (eg. + 1,1% between 2009 and 2012). Data from ISPRA report (12.2% of consumed soil) are very close to figure drawn by the most recent version of the land cover map issued by the Veneto Region (13.1%).
Looking at land capability classes (USDA) in the land capability map of the Veneto region, it appears that the most valuable soils have been lost. Concerning distribution of consumed soils between different permeability classes, looking at the soil permeability map of the Veneto Region, the most consumed soils are those with moderately high (49%) and moderately low (38%) permeability, with an infiltration speed that varies from 0.36 to 36 mm / h. These are surfaces absorbing most part of medium intensity rains, ensuring land flood safety; once sealed, water that cannot infiltrate the soil runs off in the surface

water network. Considering the Available Water Capacity (AWC) of consumed soils, taken from the AWC soil map of Veneto Region, water reserve has decreased by 2.4 million m3 between 2012 and 2015.

Forest and the City: Peri-urban Forest Land Cover Patterns in Europe

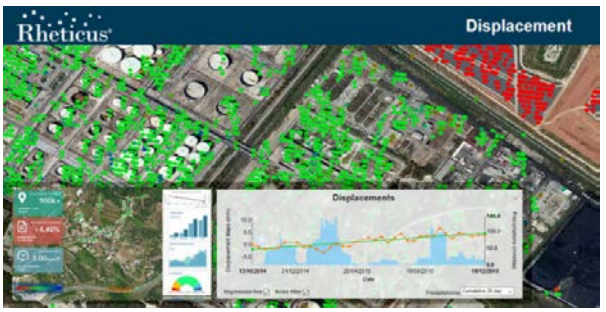
Heterogeneous definitions of urban areas and poorly homogenized forest data at the country scale have hampered the comparative assessment of the composition and configuration of peri-urban forests in developed countries. The present study investigates selected landscape characteristics of peri-urban forests in 283 metropolitan areas in Europe taking into consideration the role of the local context and the regional suburbanization trends. Using landscape metrics derived from Urban Atlas maps (Copernicus/GMES initiative providing a comprehensive land-use assessment of European cities > 100,000 inhabitants), significant differences in peri-urban forest structure were detected in five European regions. Specific class metrics (percentage of forest area, average patch size**,** perimeter-to-area ratio) were correlated with urban morphology, landscape and territorial indicators. On average, forest cover is larger in northern and southern European metropolitan areas. Forest patch size increases from western to eastern Europe, with more regular patch shapes in central and eastern regions and less regular shapes in the rest of Europe. Forest class area increases with the area of discontinuous, medium-density settlements. Forest patch size increases with the average patch size of discontinuous dense urban fabric. The evidence outlines a 'sprawl model' shaping fringe landscapes characterized by discontinuous urban settlements mixed with fragmented – but possibly well protected – forest patches.



http://land.copernicus.eu/local/urban-atlas

Rheticus: geo-analytics information services from Sentinels data to monitor infrastructures and ground stability hazards

Rheticus® Displacement is a geoinformation service designed to monitor ground surface movements, the areas subject to landslides and subsidence and the stability of infrastructures. The mapping activity is made through the monitoring of points on the ground with high stability called Persistent Scatterers (PS). The PS is produced through the processing of the European Copernicus Sentinel-1 satellite images or COSMO-SkyMed satellite data. The Rheticus® Displacement



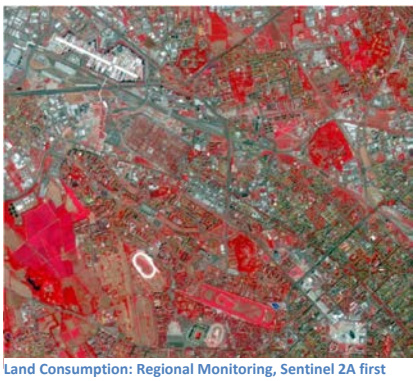
geo-analytics information service is able to detect millimetric movements of the ground and of the infrastructures (e.g. buildings, railways, roads), but also to provide information on anthropic changes and infrastructural dynamics over the area where the infrastructure is established. The use of satellite data are a valuable alternative to expensive field campaigns. The service which is already used by main European infrastructures and transportation engineering companies is targeted to: Infrastructures and works managers and builders; Public Administration; Planners &

professionals in the territory.

Rheticus® Displacement is one of the services provided through the www.rheticus.eu cloud platform. The Rheticus® platform services are also tailored to monitor urban dynamics, landslides, terrain displacements, wildfires and water quality. Shifting from data provision to geospatial knowledge and geo-analytics, its services are delivered by subscription and worldwide through a growing network of resellers.
Developed by Planetek Italia, Rheticus® has been already awarded in several competitions and prizes at Italian and international level.
Information and sample data on http://www.rheticus.eu

The use of the Sentinels to detect illegal water abstraction and over-extraction for irrigation purposes

ARPA Lombardia has been using satellite and aerial remote sensing since 2003. Since then, the Agency has developed a series of operational Earth Observation services concerning: the estimate of the snow water equivalent, used for the water resources assessment of Lombardy and as an early warning of water scarcity and drought events; the assessment of crop water requirement; the monitoring of glaciers dynamics due to climate change; the monitoring of agricultural land consumption caused by the expansion of urban areas; the monitoring of the impacts of great construction sites on natural areas; the mapping of asbestos-cement covers; the ground deformation related to landslides and to subsidence induced by extraction of water or hydrocarbons. The coming of the Copernicus Sentinels has brought a revolution in terms of quality, frequency and accessibility of information that ARPA Lombardia is exploiting in order to develop new Earth Observation services related to: the monitoring of the application of the best farming practices for the manure spreading in compliance with the Nitrate Directive; the monitoring of the water quality of lakes, in compliance with the Water Framework Directive; the support to the Civil Defense in assessing the risk of forest fires. With the European project IMPEL WODA (Water Over-abstraction and illegal abstraction Detection and Assessment) ARPA Lombardia has tested, together with ARPA Emilia Romagna and partners from Malta, Cyprus, Romania, Belgium, Slovenia and Spain, the use of the Sentinels to detect the cases of illegal water abstraction and over-extraction for irrigation purposes.


Land Consumption: Regional Monitoring, Sentinel 2A first images

In the frame of the regional project SUOLI (Urbanized Surfaces: Job Opportunities for Enterprises), ARPA Lombardia is developing a new approach to the mitigation of land consumption aimed at the early detection of brownfields and degraded/underused areas in order to foster regeneration processes and to prevent further consumption of agricultural land. The project applies innovative geospatial intelligence criteria to Sentinels and in-situ unconventional data such as electricity consumption to identify recently

closed industrial plants.

Space Business

The first National Catalogue of the Space Industry

The Italian National Catalogue of the Space Industry is an initiative promoted by the Italian Space Agency (ASI) and the Italian Trade Agency (ITA) in cooperation with the National Associations AIAD, AIPAS and ASAS with the aim of providing a daily job tool for national and foreign professionals involved in different application domains. The proposed objectives are: to provide visibility to the national space industry system, to improve the cooperation at international level and to facilitate the commercial promotion of business. The Catalogue will be disseminated during the main trade and scientific-technologic exhibitions of the sector and during national and international events. An annual update of the electronic version of the catalogue is provided, as well as a limited number of copies to circulate the Embassies of Countries active in the space sector. The companies inclined to adhere can find detailed information of what is required to the aim of publication of their own company profile available on ASI website.

http://www.asi.it/

Italian Space Industry Catalogue 2017

Benefits are already there! EC releases the first Copernicus Market Report

http://www.copernicus.eu/

The Copernicus Market Report is built on the outcomes of previous studies and on interviews with more than 140 people representing institutional stakeholders as well as the private sector, from micro to large companies. In the Report are quantified the benefits generated by the Programme and showed the first positive impacts of the availability of Copernicus data, free, full and open based enabling the development of many commercial applications, of which benefited both the service suppliers and the end users. In details the impact of Copernicus on eight key sectors (agriculture, forestry, urban monitoring, insurance, ocean monitoring, oil & gas, renewable energies and air quality management) is described. According to this Report the Copernicus Programme significantly boosted the European space sector. Copernicus Market Report.

An industrial perspective of Copernicus

Geoff Sawyer, EARSC Secretary General : http://copernicus.eu

"We are entering a new era of Earth Observation. The European flagship programme Copernicus,

marked by the launch of Sentinels and satellites is finally becoming reality. The launch of many new satellite constellations by start-up companies promise to deliver high quality data in abundance. One of the biggest hurdles to overcome is to understand first the boundary between the activities of the private and public sectors and its impact on fair competition before companies invest in developing new services. If some of these barriers can be brought down, Copernicus should be an excellent lever to drive growth in the sector over the next years". From the interview to Geoff Sawyer, Secretary General of the European Association of Remote Sensing Companies (EARSC). Read the interview

Events

Copernicus National User Forum Workshop on Climate Services

The Copernicus National User Forum Workshop on Climate Services took place in Rome last February 27th at the premises of the Italian Presidency of the Council of Ministers. This event represented a relevant opportunity for interaction with the European Commission's delegations DG GROW - Copernicus Unit and ECMWF (European Centre for Medium-Range Weather Forecasts and Service Provider of the Core C3S) but also with the national community operating in the field of climate monitoring. The most suitable context for them using services and products supplied by the European Copernicus Programme, to express their own "*user requirements*". To Know more

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