

O uso de dados Sentinel para apoio na gestão e ordenamento do território terrestre e marinho
The use of Sentinel data for supporting land and marine spatial planning and management

Especificidades de pequenas ilhas oceânicas
Specificities of small oceanic islands

28 Setembro
September 2015

Laboratório Regional de Engenharia Civil
Ponta Delgada, São Miguel - Açores



1

ABSTRACTS | RESUMOS

Rogério Ferraz

The use of earth observation data for monitoring, inspection and fisheries management activities in ocean areas | A utilização de dados de observação da terra para monitorização, inspeção e gestão de atividades da pesca em áreas oceânicas

The Regional Fisheries Inspection of the Regional Secretariat for the Sea, Science and Technology has as mission monitoring, control and inspection of the sea in the Azores with regard to the fishing activity. In addition to the staff of inspectors who performs regularly inspection missions in all the islands of the archipelago. Currently we use a number of tools that assist our mission, among them stand out the Vessel Monitoring Satellite System - VMS, as well as the Automatic Identification System - AIS, tools that allow to perform the control and monitor of activities throughout the EEZ of the Azores. It is currently being implemented, on specific coastal locations, a video surveillance system and begin the use of Autonomous Aerial Vehicles - commonly known as drones, which will improve the supervision and control of maritime areas.

With regard to the use of earth observation data, and considering the current tools available, we believe that this source of information could be complemented with VMS and AIS, and will allow us to identify possible vessels not legal in operation, either because they lack the obligation of use of automatic identification systems, either because they operate illegally. The identification of possible targets using radar images, enable us, with the assistance of drones, carry out aerial inspection and control of those and check what kind of activity is being made by them.

Raquel Medeiros, Marlene Antunes, Vanda Marcos, Elisabete Mendonça, Joana Nava

The potential of Copernicus data for future Corine Land Cover in Azores | O potencial dos dados Copernicus para futuros Corine Land Cover nos Açores

CORINE Land Cover (CLC) project for the islands of the Autonomous Region of the Azores (RAA) was executed between 2011 and 2013, by Regional Secretariat for Transport and Tourism and Directorate-General for Territorial Development. The production of CLC-RAA cartography was based on the visual interpretation of LANDSAT and SPOT satellite images and other auxiliary data, such as aerial photos.

In mid-2015, under the Copernicus Programme, the Sentinel-2 satellite was launched, whose 10–20 m resolution images are suitable, for instance, for pan-European high-resolution products, such as CLC cartography. The use of Sentinel satellite imagery, together with Contributing Missions, has a huge potential for the production of the future CLC in Azores, because of the frequent revisit time of the satellite, which will allow land cover changes to be detected more frequently. Such frequency will also increase the possibility of getting cloud-free images, particularly in regions prone to cloud cover such as RAA.





Ana Moreira, Joana Pombo

The role of Geographic Information Infrastructures on supporting management and availability of information: the case of the Regional Secretariat for Agriculture and Environment | O papel das Infraestruturas de Informação Geográfica no apoio à gestão e disponibilização transversal de informação: o caso da secretaria regional da Agricultura e Ambiente

The Regional Secretariat for Agriculture and Environment (RAAS) is in charge of policies related to agriculture and livestock, rural development, agricultural training and extension, forestry, environment, land and water resources of the Azores.

Aware of the importance of geographic information systems and use of Earth Observation data as key decision support tools, RAAS has a spatial data infrastructure that compiles information from different areas of the various agencies that are part of it. With a view to updating the existing data and the production of thematic cartography that RAAS does not yet have in the context of the Community Directive INSPIRE, the use of SENTINEL data can be of great importance for work to be developed by RAAS.

Diamantino Henriques

Sentinel applications and products for Atmosphere and Climate monitoring: the importance of the Azores | Aplicações e produtos do Sentinel para a monitorização da Atmosfera e do Clima: a importância dos Açores

Satellite data is one of the main sources of information for weather forecasting but also for atmospheric and climate monitoring. Sentinel missions will provide a set of remote sensing products for atmospheric composition and pollutants, allowing a better understanding of its spatial distribution and evolution at global scale and its contribution to Climate Change. Sea surface temperature and level will be monitored providing information about the effect of Climate Change on oceans, in particular at the scale of small islands like the Azores.

During the last decade, a set of observational facilities were developed at Azores providing an interesting platform for geophysical validation of satellite products, in particular for climate and atmospheric monitoring applications.

Susanne Lehrer

Products for Safety of Shipping and the Use at Government Agencies | Produtos para a segurança da navegação e seu uso em agências governamentais

ABSTRACT UNAVAILABLE | RESUMO INDISPONÍVEL



O uso de dados Sentinel para apoio na gestão e ordenamento do território terrestre e marinho
 The use of Sentinel data for supporting land and marine spatial planning and management

Especificidades de pequenas ilhas oceânicas
 Specificities of small oceanic islands

28 Setembro
 September 2015

Laboratório Regional de Engenharia Civil
 Ponta Delgada, São Miguel - Açores

Wolfgang Rosenthal

Meteo-Marine Near real time Products and the Use of the Service at the Weather Centers | Meteo-Marine: Produtos em quase tempo real e seu uso em centros meteorológicos

ABSTRACT UNAVAILABLE | RESUMO INDISPONÍVEL

Delfim Rego

Impact of Sentinel in EO Based Maritime Applications | Impacto do Sentinel nas aplicações marinhas baseadas em observação da terra

Sentinel-1, the first in the family of Copernicus satellites, marks a new paradigm in Earth Observation that sees the shift from demonstration and research to operational missions conceived to support users for decades to come. The potential impact for Maritime Safety & Security Systems, is huge.

This presentation will focus on a range of systems that can now be widely (and more efficiently) deployed thanks to the implementation of the Copernicus Program initiative. The systems presented shall enable end users organizations to assess the impact and benefits on their operations including the opportunity to provide enhanced analysis capacity and decision support for the Maritime Safety & Security sector.

Nuno Ávila Martins, Nuno Catarino

SenSyF and SIMOcean: data access and integrated processing for Earth Observation services | SenSyF e SIMOcean: acesso a dados e processamento integrado para serviços de Observação da Terra

SenSyF provides a specialized Sandbox Service with tools and development/validation platforms where developers are able to implement and test their applications, and then tap into a distributed pool of cloud resources when ready for the exploitation phase. This framework allows for the development and testing of new processing chains and methods for Sentinel and Copernicus/GMES contributing mission data on a continuous basis, and the delivery of higher-level products and services complementing the information provided by the (pre-) operational services.





Ana Teodoro

Remote sensing of the coastal zones: present status and priorities for future research | Detecção remota das zonas costeiras: estado atual e prioridades para o futuro

My presentation, entitled “Remote sensing of the coastal zones: present status and priorities for future research” will present the main priorities of Copernicus program focused in the ESA satellites (Sentinels) specifically designed for the operational needs of this programme.

More specifically, this presentation will address several problems related to coastal zones that could be investigated through remotely sensed data. Finally, will be discussing the advantages of the use of Sentinel-2 data in coastal studies and what can Sentinels do for Regions.

Artur Gil

Potential Land Applications of Copernicus Sentinel Data in the Azores | Potenciais aplicações terrestres para dados Copernicus Sentinel nos Açores

The aim of this oral communication is to highlight the potential of Copernicus Sentinel Missions 1 (SAR) and 2 (multispectral) for land-based environmental policy support in the Azores Autonomous Region (Portugal). About 20 different types of legal and spatial planning instruments are currently being applied in this region. Most of them require detailed and accurate Land-use/Land-cover cartography in order to deliver reliable outputs at municipal, island and archipelagic scales. Both Sentinel-1 and Sentinel-2 Mission products may fulfill these requirements in a cost-effective way. A Spatial Data Infrastructure-based framework is also proposed in order to process, assess, validate and integrate this Copernicus data into the decision-support system of Azorean regional land policies.

Eduardo Dias, Dinis Pereira

Application of remote sensing studies of vegetation and habitat management in the Azores | Aplicação da deteção remota nos estudos da vegetação e gestão de habitats dos Açores

Gabinete de Ecologia Vegetal e Aplicada (GEVA) is a research group of Azores University, focused in vegetation ecology, with three main research investigation lines, that cross largely with Geographic Information Systems and Remote Sensing. We used the most current technologies, such as spectral analysis of Landsat and Rapideye images, as well as drone aerial photography. The Sentinel satellites can potentially be an important source of information in the context of the investigation lines:



O uso de dados Sentinel para apoio na gestão e ordenamento do território terrestre e marinho
The use of Sentinel data for supporting land and marine spatial planning and management

Especificidades de pequenas ilhas oceânicas
Specificities of small oceanic islands

28 Setembro
September 2015

Laboratório Regional de Engenharia Civil
Ponta Delgada, São Miguel - Açores



In the descriptive research, oriented to natural values management and conservation, which includes field surveys and flora and habitats mapping, with resulted outputs: (a) evaluation and classifications, through mathematical analyzes, of habitats and species distributions; (b) land cover mapping for support of biodiversity management, protected areas and landscape changes, as well as species and habitats distribution patterns. For the analytical research, focused on: distribution patterns of rare species, conservation status and restore capabilities of habitats (such as peatlands) and distribution of landscape structuring species and habitats (e.g. Sphagnum sp).

In the modelling and management support: (a) modelling the potential distribution of habitats, such as natural forests and peatlands, and ecological optimum for plant species and ecosystem services, such as carbon sequestration, water retention and biodiversity; (b) management support (monitoring), with emphasis on some projects such as: Sustainable Management Certification for the production forests, Monitoring of NATURA 2000 NETWORK (terrestrial areas), Habitat Restoration in RAMSAR area (WETREST project) and Monitoring Geothermal Project of Terceira island.

José Rafael Marques da Silva

Sentinel 2a/2b social value for agriculture management | Valor social do Sentinel 2a e 2b para a gestão agrícola

Earth observation systems typically have a high social cost as they are usually very expensive and because of that such costs need to be refunded. In this sense, all satellites like SENTINEL 2A/2B, need to valorize all the information they produce transforming it into valuable knowledge. Is this transformative capacity that will increase its social value, however, transforming information into knowledge its normally hard and complex and in the particular case of agriculture there exists an interaction need between information and knowledge producers as well as knowledge users.

In the particular case of agriculture applications and considering the spectral, spatial, temporal and radiometric characteristics of SENTINEL 2A/2B, I strongly believe that these type of satellite images will have a high social value potential, however, this value will only be true if agricultural technology developers receive insights from agricultural decision-makers in order to be able to promote agronomical, environmental and economic value from these information.

The communication between agricultural technology developers and agricultural decision-makers is in my opinion the key to the success. Otherwise SENTINEL 2A/2B satellite images will have a high social cost and a low social value. At list for agriculture management!

In conclusion and during the presentation, two different study cases will be presented (grains and vines), illustrating the ideas presented above.



O uso de dados Sentinel para apoio na gestão e ordenamento do território terrestre e marinho
The use of Sentinel data for supporting land and marine spatial planning and management

Especificidades de pequenas ilhas oceânicas
Specificities of small oceanic islands

28 Setembro
September 2015

Laboratório Regional de Engenharia Civil
Ponta Delgada, São Miguel - Açores

Teresa Ferreira, João Luís Gaspar, Gabriela Queiroz

Sentinel and Copernicus in support of geological hazards monitoring and emergency management | O apoio dos Sentinel do programa Copernicus na monitorização de perigos geológicos e na gestão de emergências

The Azores islands correspond to one of the active regions of Europe prone to natural hazards. Since the settlement of the Azores in the 15th century, more than 30 important earthquakes and a similar number of volcanic eruptions resulted in thousands of deaths and severe damages. Landslides are recurrent events causing significant destruction and loss of lives.

The Copernicus Earth Observation Programme and its constellation of satellites, the Sentinels, is increasing the geohazards monitoring ability, providing systematic data acquisition that will allow scientists to better understand the dynamics of many geophysical phenomena. SAR interferometry can monitor ground deformation from tectonic, volcanic or slope instability origin contributing for early warning of potential disasters. Complementarily, the satellites frequent revisit provides timely, almost near-real-time data useful for emergency management, before, during and after disasters.

Eduardo Brito de Azevedo, Conceição Juana Fortes, João Alfredo Santos, Maria Teresa Reis, Pedro Poseiro

Integration of Sentinel data into a wave flood forecasting and warning system for ports and coastal zones (HIDRALERTA) | Integração de dados Sentinel num sistema de previsão, alerta e aviso de inundação por ondas em zonas costeiras e portuárias (HIDRALERTA)

The research project HIDRALERTA - "Flood Forecast and Alert System in Coastal and Port Areas", is going on and its main objective is the development of a system for forecasting, warning and assessment of risks associated with wave overtopping and flooding in coastal and port areas, supported by measurements/predictions of sea waves in these areas. The case studies considered are the port and bay of Praia da Vitória, at the Terceira Island, Azores, and the beach of S. João da Caparica, at Costa da Caparica, Lisbon. To this end, the project involves both wave measurements at the study areas and numerical and physical modeling.

One important issue of the development of HIDRALERTA system is its validation both as a whole and for each component. This validation can be made through several methodologies (in situ measurements, physical modelling and others including satellite images).

The use of Sentinel data can help on this validation. In fact, extraction of large scale geographical information from high resolution satellite images with high temporal frequency is an efficient source of updated land use/land cover (LULC) to feed environmental models. The use of Sentinel data will permit to identify flooded areas.

Such information may contribute to the validation of the HIDRALERTA in what concerns the predicted wave field as well as flooded areas.

This presentation describes the HIDRALERTA system as well as its application to the study area of Praia da Vitória, at the Terceira Island, Azores, namely in the prediction of overtopping and flooding events. This will illustrate how Sentinel data may be incorporated into the HIDRALERTA and / or contribute to its validation.

