

TRACKING A BURNING ISSUE FROM SPACE

FIREHUB wins Copernicus Masters Best Service Challenge 2014

The Best Service Challenge seeks to increase the awareness of existing Earth monitoring services and their benefits to citizens. It is one of nine categories in the Earth monitoring competition Copernicus Masters. The Best Service Challenge invites service providers to submit profiles of their existing services to the Copernicus Masters. The 2014 edition welcomed all submissions addressing any of the GEO (Group on Earth Observations) Societal Benefits Areas: Agriculture, Biodiversity, Climate, Disasters, Ecosystems, Energy, Health, Water, and Weather.



Wildfires destroy many thousands of hectares of forest every year, but also devastate the environment, including both agricultural and urban areas. The resulting damage amounts to as much as one per cent of GDP in most European countries. The continent is affected by more than 50,000 forest fires every summer, particularly in hot, dry member-states such as Portugal, Spain, France, Italy, and Greece. For these and other reasons, the Copernicus Masters jury of experts selected FIREHUB as this year's best existing Earth observation service. The operational EO based fire management service was developed by Dr Charalampos (Haris) Koutos and his team as part of the BEYOND project www.beyond-eocenter.eu at the National Observatory of Athens (NOA), Greece.

Lena Klemm from Anwendungszentrum GmbH Oberpfaffenhofen, the company that organises Copernicus Masters, met with Dr Koutos at the Satellite Masters Conference in Berlin to find out more about FIREHUB.

Could you please describe the main features your service offers in one sentence?

FIREHUB is a service platform that consolidates a real-time fire detection and monitoring application, large-scale burn scar mapping during and after wildfires, and a smoke dispersion forecasting tool by integrating space technologies with geospatial information and meteorological data.



Who will benefit from FIREHUB?

FIREHUB provides real-time information on the status of fires and how they are spreading on the ground to authorities that are actively involved in fire disaster management and firefighters operating in the field. The platform addresses real decision-makers' needs and has been deployed on an operational basis to several user stakeholders, including the Greek Forest Fire Management Center of the Fire Brigade, the Ministry of Environment Energy and Climate Change, the Hellenic Telecommunications Organisation, and other local and regional authorities. The user base is rapidly expanding,

with more than 500 independent connections (institutional users) every day during the summer. In addition, the service provides three-dimensional, real-time assessments of smoke propagation and organic carbon concentrations on an hourly basis. This information is provided to authorities responsible for air traffic control and taking immediate action to protect human health when large quantities of smoke are moving toward densely occupied urban areas. Finally, FIREHUB provides diachronic fire mapping for all of Greece for every year since 1984, which is when Greece was first mapped by a Landsat satellite. This database of burn area maps provides

unique information to scientists and authorities for modelling and validating future fire risk assessments in the southeastern Mediterranean region.

How can the service be accessed, and what quality standards does it fulfil?

The FIREHUB service is delivered through the BEYOND Center of Excellence for Earth observation-based monitoring of natural disasters, which is located at the National Observatory of Athens and supported by the European Commission.

FIREHUB is integrated in the Global Fire Monitoring Center, which is part the UN's International Strategy for Disaster Reduction. The service has also been certified in the framework of several EC, Copernicus, and ESA projects that rely on fully scalable, transparent, and automated processes and support the transfer of applications to other climatic and geographic zones in Europe.

What role does satellite data play in your service?

In deriving its detailed maps, the FIREHUB tool relies on many different types of satellite data of high and very high spatial resolution. Large volumes of satellite data originating from ESA, NASA, and contributing satellite missions are used to generate and deliver burn area maps and disaster assessments to authorities within just a few hours (or at most, several days).

What kind of Earth observation data do you currently use for your service?

We acquire satellite images every five minutes from EUMETSAT's Meteosat satellites, which follow an elaborate, fully automated processing chain to produce images of fires on the ground. This imagery provides objective representations of disaster situations from space. Every five-minute update is also automatically passed on to fire brigades' control rooms on a 24/7 basis. The unique feature of the service is that it exploits the very high temporal resolution of satellite image acquisition offered by the Meteosat satellites (every five minutes) while at the same time it enhances the spatial resolution of the satellite observations by 50 times thus providing information on fire occurrence on the ground with the spatial resolution of 500m.

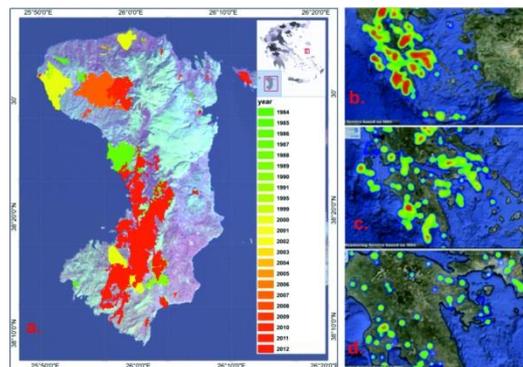
Will your service make use of the Copernicus programme?

This service will be greatly enhanced by the upcoming Copernicus missions involving the ESA's Sentinel satellites. I should also mention that the National Observatory of Athens and ESA have agreed to develop and operate the first collaborative ground segment for the Sentinel missions, which will facilitate real-time acquisition of Sentinel-1 and Sentinel-2 data (and support Sentinel-3 and Sentinel-5p in the future). FIREHUB is a fully Copernicus-compliant service that follows Europe's emergency response and emergency support standards, which means it can be transferred to any region in the world.

Why did you submit FIREHUB to the Copernicus Masters Best Service Challenge?

FIREHUB is the result of seven years of intensive work. Thanks to advanced EO and IT technology, it finally became possible for us to develop and use the innovative modelling and value-added processing chains needed to deliver the service. We believe we've succeeded in creating a useful tool that many operational users all over Europe work with every day to mitigate fire disasters and make people's lives a little more safe. We're more than pleased that the esteemed evaluation jury also saw the value in FIREHUB and named us the winner of the Best Service Challenge.

In addition to being an amazing honour for our work, winning the challenge has drawn a great deal of attention to our service, which will be a big help in establishing new partnerships and enlarging our user base. I'd like to take this opportunity to express my gratitude to my entire team for never giving



up, even when there were serious technical issues; and to fellows, friends, and family who encouraged me to go ahead and made this moment possible.

Link to FIREHUB

The FIREHUB tool is available online at: <http://ocean.space.noa.gr/FireHub>

About the Copernicus Masters

Since 2011, the Copernicus Masters competition has showcased the most innovative solutions for business and society based on Earth observation data. Its purpose is to drive the development of market-oriented applications that utilise data generated through Europe's Copernicus programme. Each year, an array of prominent partners sponsors several exciting topic-specific challenges. Geared primarily toward start-ups and other companies, researchers, and students, the 2015 competition will be accepting submissions from April to July at www.copernicus-masters.com. Copernicus Masters is organised and carried out by Anwendungszentrum GmbH Oberpfaffenhofen, which supports aerospace-related start-ups and commercial applications just outside of Munich, Germany.