



A message from the editor

By *Stefanie Linser*, Environment Agency Austria

The EUFODOS project is approaching its last quarter and the final results are ready to be presented in this and the forthcoming issues.

I would also like to draw your attention to our final meeting in Brussels/Belgium on 2nd and 3rd December 2013. More information will soon be available at our website.

Demonstration of EUFODOS Downstream Services based on RapidEye data

By *A. Marx and K. Frotscher*, RapidEye AG

RapidEye, a leading provider of quality high-resolution satellite imagery based in Berlin, Germany, is displaying satellite-based downstream services using RapidEye imagery for the identification of damaged forest areas caused by the mass outbreak of defoliating insects. The Forest Vitality Monitoring Service, developed under the EUFODOS project, provides reliable information about the vitality status before, during, and after insect infestation, as well as detailed change maps of affected sites.

Regional forest administrations need timely information about the affected areas to support their forest protection monitoring duties. Accurate maps can be provided based on cost-effective RapidEye data. Based on specific user requirements defined by a public forest institution under the federal state of Brandenburg, Germany, downstream services have been successfully demonstrated in Brandenburg in 2012 and 2013.

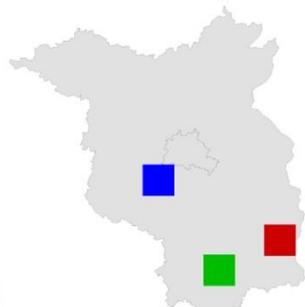


Fig. 1: State of Brandenburg, Germany and the service test sites Potsdam (blue), Babben (green) and Lieberose (red).

EUFODOS Downstream Service: Forest Vitality Monitoring

Forest disturbances and related vitality problems, such as defoliation, foliage discoloration, and general physical damage are common in forests

In this issue

- Message from the editor
- Demonstration of EUFODOS DS based on RapidEye data

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around the world. The Forest Vitality Monitoring Service provides maps showing the vitality status of the forest canopy and its changes for defined time intervals. The maps help the forest manager identify affected sites rapidly and reliably, without the need for time-consuming ground surveys. In the case of a severe attack by defoliating insects, the location, extent, and magnitude of the damage are mapped. The change layers help the foresters locate new infestation nests by following the calamity progress over several years. The service can further support precision insecticide application planning as well as application success control.

The Service is built around key advantages of the RapidEye system:

- **Baseline (Archive) Data** – Adding over one billion square kilometers of imagery to its archive every year RapidEye ensures that sound baseline are available on forested areas worldwide.
- **Recent (On-Demand) Data** – Forest Vitality Maps can be generated from the most current cloud-free imagery acquired on-demand.
- **Reliable (Monitoring) Updates** – The Rapid Eye constellation's imaging capacity allows for highly-accurate area-wide change map production each year.
- **Detailed** – Five-meter pixels and five spectral bands make RapidEye imagery ideal for forest feature extraction at a minimum mapping unit of 0.2 hectares..
- **Ready to Use** – No further data adjustments are required. Maps are delivered in a GIS-ready format for visualisation and further analyses in Forest Information Systems.

Example 1 - Forest Vitality Monitoring in Oak stands infested by the Oak Processionary

Oak species have been under severe stress in Germany for almost a decade. In 2012 the ongoing oak processionary (*Thaumetopoea processionea*) and



oak feeding society infestation resulted in an affected total area of more than 13,000 ha in the State of Brandenburg (Source: Eberswalde Forestry State Center of Excellence - LFE). In order to demonstrate the service for oak stands a test area was selected in the surrounding of Potsdam and the service successfully implemented.



Fig. 2: RapidEye baseline image from June 28, 2011 (color-infrared).



Fig. 3: RapidEye on-demand image from May 26, 2012 (color-infrared).

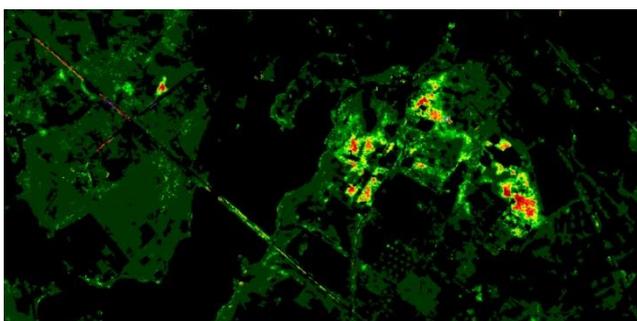


Fig. 4: Defoliation caused by the oak processionary. The map shows the Relative Vitality Change (deterioration) of oak-dominated broadleaf forest between June 2011 and May 2012. Red colors indicate sites of severe defoliation (Source: RapidEye).

Example 2 - Forest Vitality Monitoring in Pure Pine Plantations infested by the Nun Moth

According to LFE, mass propagation and spread of the nun moth (*Lymantria monacha*) continued in 2013 in the State of Brandenburg. Approx. 20,000

hectares of forest show massive feeding damages. Two areas Babben and Lieberose were selected to demonstrate the service capabilities.

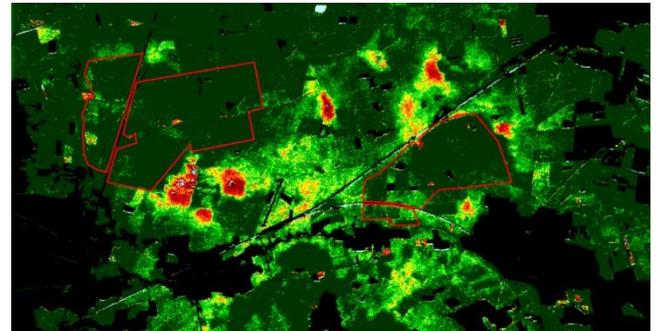


Fig. 5: Defoliation caused by the nun moth in pure pine forest near Babben. The map indicates Relative Vitality Change (deterioration) between August 2011 and August 2012 (Source: RapidEye). Red polygons overlaid demarcate areas of previous insecticide application (Source: LFE).

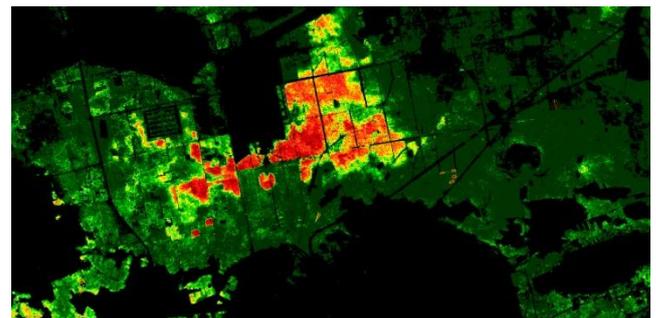


Fig. 6: Defoliation caused by the nun moth in pure pine forest near Lieberose. Relative Vitality Change (deterioration) between March 2013 and August 2013 (Source: RapidEye).

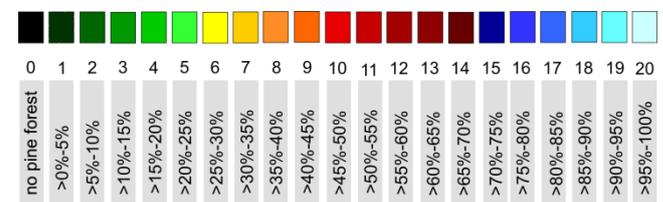


Fig.7: Standardized color scheme for Relative Vitality Change Maps shows the decrease of the vegetation signal in 5% steps (see Figures 4, 5 and 6).

Upcoming events

EUFODOS Final Meeting, 2-3 December 2013 in Brussels, Belgium. **Open for all interested stakeholders.** Contact: eufodos@joanneum.at

EUFODOS Website

<http://www.eufodos.info/>