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Automated Earth Observation time-series monitoring with OGC-compliant web services

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ABSTRACT:

Earth Observation (EO) time-series data are valuable information to monitor the change of the environment. Several datasets exist that are provided free of charge like the Moderate Resolution Imaging Spectroradiometer (MODIS) sensor providing global satellite data over the last 14 years. This data is widely used for analyzing environmental changes, but so far it is a complex task to get time-series datasets for a specific area of interest. To monitor the vegetation with EO time-series data, many processing steps have to be conducted for data download, information extraction, sub-setting, masking, and exporting to other data formats for any dataset in the time-series. Therefore, it is an important objective to provide easy access, analysis, and monitoring functions to time-series data so that they can also be used by non-specialists (e.g., decision makers, stakeholders).

Web Processing Services based on specifications of the Open Geospatial Consortium (OGC) were developed to provide standard-compliant tools for automated data access, analysis, and monitoring. Access and analysis tools for MODIS time-series data (e.g., provided by Google Earth Engine) can now be used with standard-compliant web-based geoprocessing services. Furthermore datasets can be converted to OGC Sensor Observation Services to provide monitoring functions. These were updated automatically when new data is available. In combination with alert and notification services, a user can get an email if new data reaches a prior specified limit or has a specific value (e.g., fire in area of interest).

In this presentation the author will provide the concept and technical details of the developed spatial data infrastructure providing automated data access, analysis, and monitoring tools based on OGC-compliant web services. Use cases were presented showing the capabilities of the developed infrastructure and clients (webportal, mobile app) as well as use cases for the provided time-series monitoring service within the EU FP7 EuRuCAS project.

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