

SenThIS - Sentinels of Thuringian information systems

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Decision-making for sustainable environmental resource management or risk prevention is facing the problem of constantly changing conditions related to the projected changes of climate, demography and socio-economy. Therefore, adaptable tools and methods which can reflect such changes are needed for an efficient management. The need to improve existing tools is a challenge the departments of German environmental authorities at state and federal level are facing at this time. Additionally the increasing demands for work process optimization due to financial cutbacks are coming into play.

Consequently the need for suitable adaptation measurements for short and long term changes of environmental state variables is growing. The importance of spatio-temporal data, providing continuous observation about the state of the environmental system and its changes, is therefore increasing in order to elaborate adaptation strategies. In this case earth observation is a useful source for the required data. With the new Sentinel fleet, ESA's Copernicus Program is providing a possibility to obtain such information free in high temporal and spatial resolution.

The BMVI funded project SenThIS, a collaborative project by the Thuringian State Institute for Environment and Geology (TLUG), the Thuringian Forest Department and two SMEs EOS GmbH and Feiffer consult is aiming at utilizing Copernicus data and services for operational tasks on a federal level. It addresses this aforementioned deficit through the development and implementation of a processing chain for synergetic and automated application of remote sensing data and products to accomplish operational state tasks. The product development is characterized by the synergetic application of remote sensing data and suitable models. Design and calibration of the models base on Sentinel 1/2 data and additional information (e.g. meteorological data, in-situ measurements). This results in products of highly temporal and spatial resolution for entire Thuringia. Simultaneously a performance evaluation of the developed products as well as the establishment of those products and other suitable Copernicus services in form of an operational application of public tasks should be reached.

Within the project framework prototypical remote sensing products for state authorities will be developed. In particular, a soil moisture product derived by process oriented modelling utilizing remote sensing data that is going to provide updated comprehensive information at a three to six day interval will be developed. The development will be accompanied by detailed evaluation, validation and uncertainty analysis using various information from different sources. The soil moisture product is expected to help in the improvement of the established flood forecast systems, crop yield estimation or forestal state reviews. Additional products like a snow product or the derivation of agricultural stock parameters will be developed or gained from existing Copernicus products.

By the resulting data and processing infrastructure SenThIS enables the involved authorities to work faster and more efficient. Thereby a better forecast, detection and reaction to environmental risks and potential catastrophes will become possible.

The poster presents the underlying idea and structure of the SenThIS project along with the first results of the first project year.