

SAPS: Estimating the Evolution of Forest Masses and Crops using Cloud Resources

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SAPS is a service to estimate Evapotranspiration (ET) and other environmental data that can be applied, for example, on water management and the analysis of the evolution of forest masses and crops. SAPS allows the integration of Energy Balance algorithms (e.g. SEBAL and SEB) to compute the estimations, that are of special interest for researchers in Agriculture Engineering and Environment. These algorithms can be used to increase the knowledge on the impact of human and environmental actions on vegetations, leading better forest management and analysis of risks.

SAPS uses containers on top of a cloud back-end to facilitate the deployment of customizable versions of energy balance algorithms that are broken in a three-stage pipeline: input data download, input preprocessing, and evapotranspiration estimation. SAPS comes with a number of implementations for these stages. In particular, it provides two different versions for the input download stage that use different data sources. The reference input download implementation uses multiple data providers. Landsat imagery is downloaded from the Google Earth Engine (GEE) platform. Meteorological information is provided by the National Centers for Environment Information, and elevation data is provided by the Consortium Spatial Information. All data is downloaded from mirror servers of these services managed by the Federal University of Campina Grande (UFCG). The alternative implementation works similarly to the reference implementation, but downloads Landsat imagery from the USGS service, instead of GEE.

In the context of EOSC-Synergy, SAPS is being integrated with several services offered by EOSC. This will facilitate European scientists to exploit the evapotranspiration estimation services from remote sensing imagery. Currently, the service relies on the EOSC computing resources, dynamically managed by the EC3 tool. The demo will show SAPS in action, deployed on top of an elastic Kubernetes cluster over EOSC resources, whose horizontal elasticity will be automatically orchestrated by EC3 in response to changes in the workload submitted to the service.

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