



Enriching the Web Processing Service

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The OGC Web Processing Service (WPS) provides a standard for implementing geospatial processes in service-oriented networks. In its current version 1.0.0 it allocates the operations GetCapabilities, DescribeProcess and Execute, which can be used to offer custom processes based on single or multiple sub-processes. A large range of ready to use fine granular, fundamental geospatial processes have been developed by the GIS-community in the past. However, modern use cases or whole workflow processes demand specifications of lifecycle management and service orchestration. Orchestrating smaller sub-processes is a task towards interoperability; a comprehensive documentation by using appropriate metadata is also required.

Though different approaches were tested in the past, developing complex WPS applications still requires programming skills, knowledge about software libraries in use and a lot of effort for integration. Our toolset RichWPS aims at providing a better overall experience by setting up two major components.

The RichWPS ModelBuilder enables the graphics-aided design of workflow processes based on existing local and distributed processes and geospatial services. Once tested by the RichWPS Server, a composition can be deployed for production use on the RichWPS Server. The ModelBuilder obtains necessary processes and services from a directory service, the RichWPS semantic proxy. It manages the lifecycle and is able to visualize results and debugging-information. One aim will be to generate reproducible results; the workflow should be documented by metadata that can be integrated in Spatial Data Infrastructures.

The RichWPS Server provides a set of interfaces to the ModelBuilder for, among others, testing composed workflow sequences, estimating their performance and to publish them as common processes. Therefore the server is oriented towards the upcoming WPS 2.0 standard and its ability to transactionally deploy and undeploy processes making use of a WPS-T interface. In order to deal with the results of these processing workflows, a server side extension enables the RichWPS Server and its clients to use WPS presentation directives (WPS-PD), a content related enhancement for the standardized WPS schema.

We identified essential requirements of the components of our toolset by applying two use cases. The first enables the simplified comparison of modeled and measured data, a common task in hydro-engineering to validate the accuracy of a model. An implementation of the workflow includes reading, harmonizing and comparing two datasets in NetCDF-format. 2D Water level data from the German Bight can be chosen, presented and evaluated in a web client with interactive plots.

The second use case is motivated by the Marine Strategy Directive (MSD) of the EU, which demands monitoring, action plans and at least an evaluation of the ecological situation in marine environment. Information technics adapted to those of INSPIRE should be used. One of the parameters monitored and evaluated for MSD is the expansion and quality of seagrass fields. With the view towards other evaluation parameters we decompose the complex process of evaluation of seagrass in reusable process steps and implement those packages as configurable WPS.