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Automated Earth Observation data discovery and access using open source web frameworks

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Various open source software exists to build up geospatial web portals. But in most cases there are further user requirements that need to be considered. This often leads into a further development of existing software. Based on the requirements from the wetlands community that includes beside geospatial map provision also the discovery, access, and processing of Earth Observation (EO) time-series data, a new web-based software has been developed based existing open source web frameworks using the Python scripting language. The GEO Community Portal of the GEO-Wetlands Initiative acts as a first demonstrator also introducing reusable web components from GEOSS and the usage of interoperable geospatial web services.

The open source Python web framework Django is used to manage any content of the community portal and acts as a middleware between users and external web services, such as services for data discovery and access. On the one hand several map viewers with different geospatial layers (e.g., layers provided by OGC Web Map Service, Web Feature Service, Sensor Observation Service) can be configured along with user authentication; on the other hand individual geospatial features can be added (wetlands or local states as examples) and external databases can be requested based on the geometry of the features. These external databases include Earth Observation data discovery and access within the USGS Earth Explorer, NASA LPDAAC, ESA Sentinel's Data Hub, and GEOSS but also access to non-GIS datasets, such as geo-located images from Flickr. All these data discovery and access tools have been integrated into the open-source Python package "pyEOM" that has been directly linked with the Django framework.

The frontend has been mainly built up with the open source JavaScript framework Angular. Different components of the Angular framework communicate with the services from the Django backend. As such, user authentication and different map configurations can be realized. Using open source Bootstrap CSS components a responsive WebGIS portal is the basis for all frontend developments. The map configurations allow different map viewers with the same software ranging from simple viewers to complex data discovery, access, and processing systems. Different examples are shown in this presentation.