Global reference water information for flood monitoring: Increasing accessibility with STAC

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Remote sensing data has become an essential component of today's disaster management. Copernicus Sentinel-1/2 satellites are capable of providing high spatial and temporal resolution information that has proven to be effective in inundation mapping and other water management applications. In the recent years, DLR has developed a cloud-based, automated processing chain that uses convolutional neural networks (CNN) to extract surface water extent from SAR and multi-spectral images of Sentinel-1/2 satellites. Resulting water masks are aggregated to a reference water product that can be used to rapidly permanent water from temporary flooded and to analyze seasonal and long-term surface water dynamics. To unlock the full potential of the data and encourage community use, the technical barriers in access and usability have to be minimized. We approach this challenge by utilizing Spatio-temporal Asset Catalogs (STAC) to publish a global, open access collection of reference water products based on Sentinel-1/2 data. STAC enables users to easily search for matching datasets and load the data locally using open source tools. We further store data assets in the cloud-optimized GeoTiff (COG) format to improve processing efficiency and scalability. To give users a quick start, we publish a set of Jupyter Notebooks that demonstrate common use cases in the context of flood mapping such as the computation of flood duration, inundation time series analysis as well as the visualization of seasonal changes in water extent.