

Wetland mapping and monitoring

DOMAIN: WATER

Content

This EO service provides a highly automated wetland identification covering both seasonal changes of wetlands and permanent water bodies as well as the detection of long-term developments under a changing climate. This service maps the extent of wetland areas, coupled with the provision of advanced statistical analyses. Satellite-based time-series information help identify trends over longer time periods and their dynamics (intra- and inter-annual variation).

Relevance

In the scope of global climate change gross physical alterations to wetlands are becoming increasingly evident in large parts of the world. The impact of a changing climate on the functioning of monitored wetlands can be assessed quantitatively by this time-series mapping and monitoring EO service. It provides the foundation for the identification and delineation of wetlands, assessing their conditions and functions and determining trends over time. Information on the extent and morphology of wetlands is essential for basin and eco system management, guide targeted restoration efforts and evaluate their effectiveness.

This service is relevant for e.g.

- Identifying climate trends
- Water supply management
- Flood management (surface runoff estimations)
- Eco system management
- Agriculture, irrigation, livestock watering

Input data and methods

The identification of wetlands requires a temporally dense observation cycle with at least 3 cloud-free image acquisitions per season, in order to perform a reliable identification of wetlands that are covered by water only infrequently throughout the year. Hence, the input information is derived from optical missions (e.g. Sentinel 2) and radar (SAR) sensors (e.g. Sentinel 1). Specifically, the SAR sensors with their high revisit time being only minor affected by weather phenomena as e.g. clouds allow efficient mapping of wetlands and seasonal changes. This helps to better capture specifically the seasonal changes of water bodies and wetlands. In addition, supplementary contributions from Satellite missions such as Landsat 8, TRMM, MODIS and ENVISAT will be considered to improve the quality of the product.

Product examples

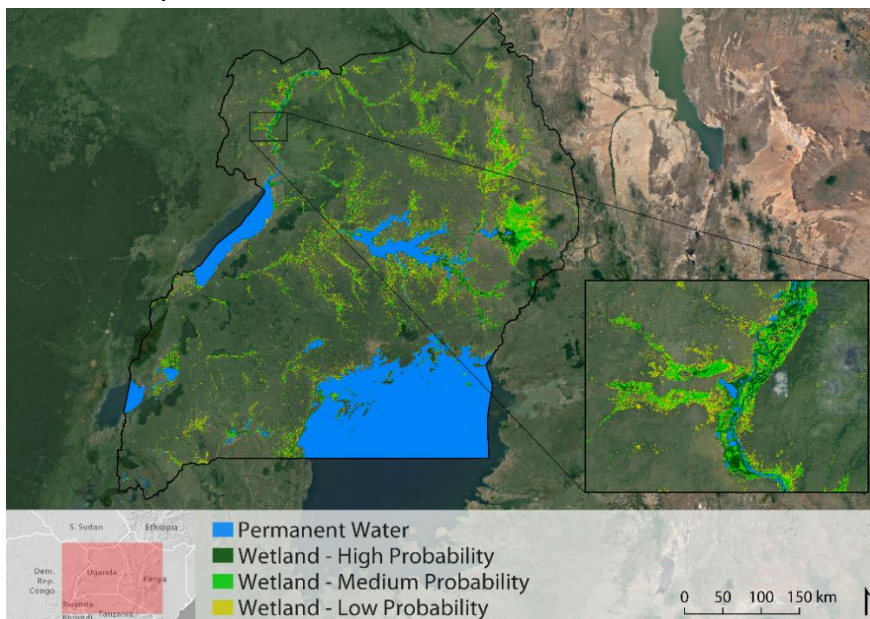


Figure 1: Combined classified surface water and wetland probability product based on time-series information at monthly intervals.

Technical specifications

SPATIAL COVERAGE

100's of km²

DATUM / PROJECTION

User defined

FORMAT

Data: GeoTiff

Analysis: XLSX or PDF

SPATIAL RESOLUTION

10m – 30m

TEMPORAL COVERAGE

1980's - now

TEMPORAL RESOLUTION

Monthly - Seasonal

THEMATIC ACCURACY

>85% overall accuracy

POSSIBLE OUTPUTS

- Classified map of temporary and permanent wetlands and water bodies
- Time series maps of wetland extents