

# DestinE - Danube Delta Use Case

## The Danube Delta

The Danube River flows through ten countries from Germany's Black Forest to the Black Sea, forming Europe's **second-largest and best-preserved delta**. This dynamic ecosystem, recognized as a **World Heritage Site since 1991**, hosts diverse wetland habitats, lakes, ponds, and marshes, attracting **over 300 bird species and 45 freshwater fish species**.

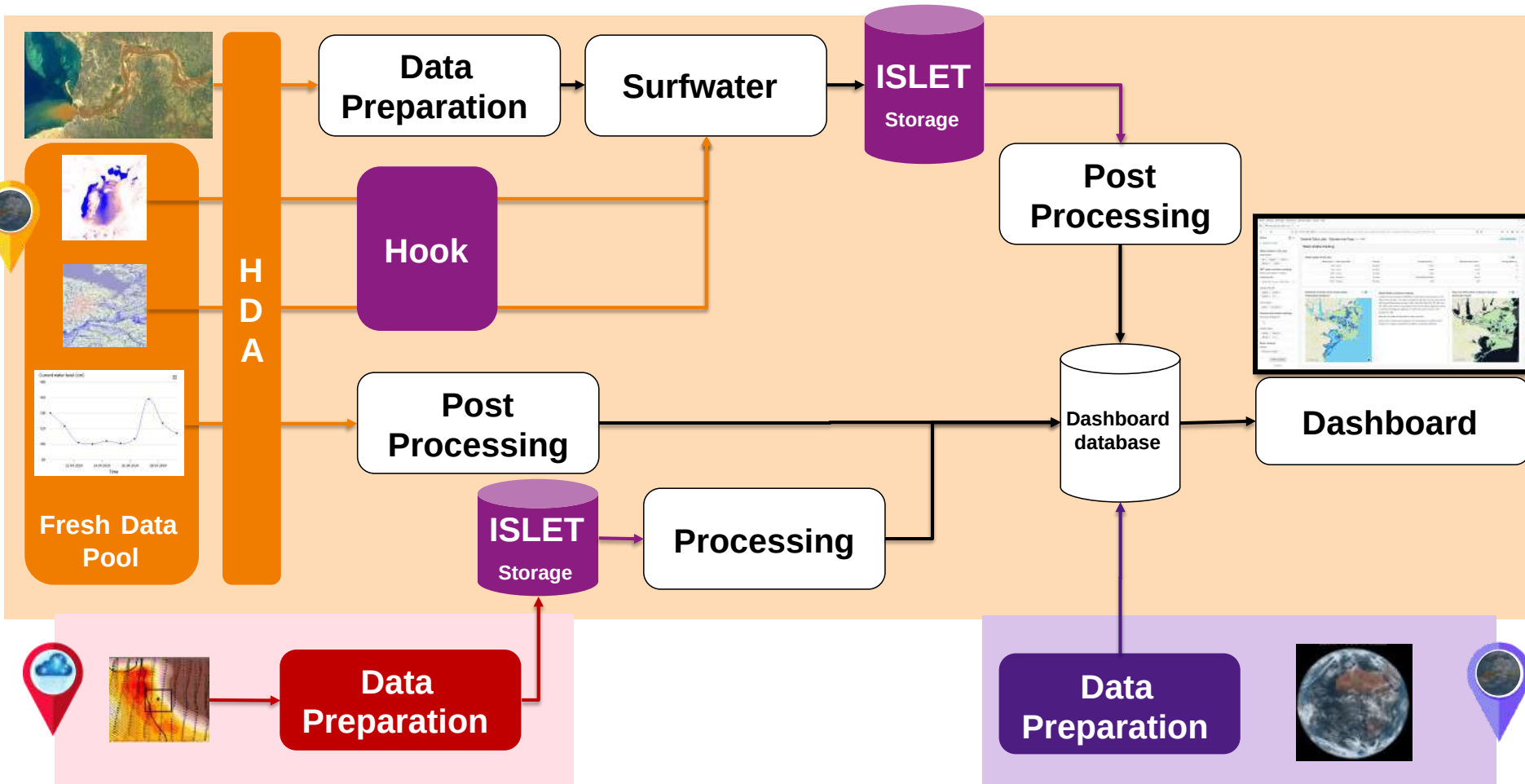


Due to climate change and increasing human activities, **real-time monitoring** of this ecosystem's hydrology is essential. Remote sensing advancements, particularly satellite products, provide insights into **water levels, flow rates, and weather forecasts**, enabling accurate ecosystem health assessments.

DestinE Data Lake is the perfect platform to address this issue.

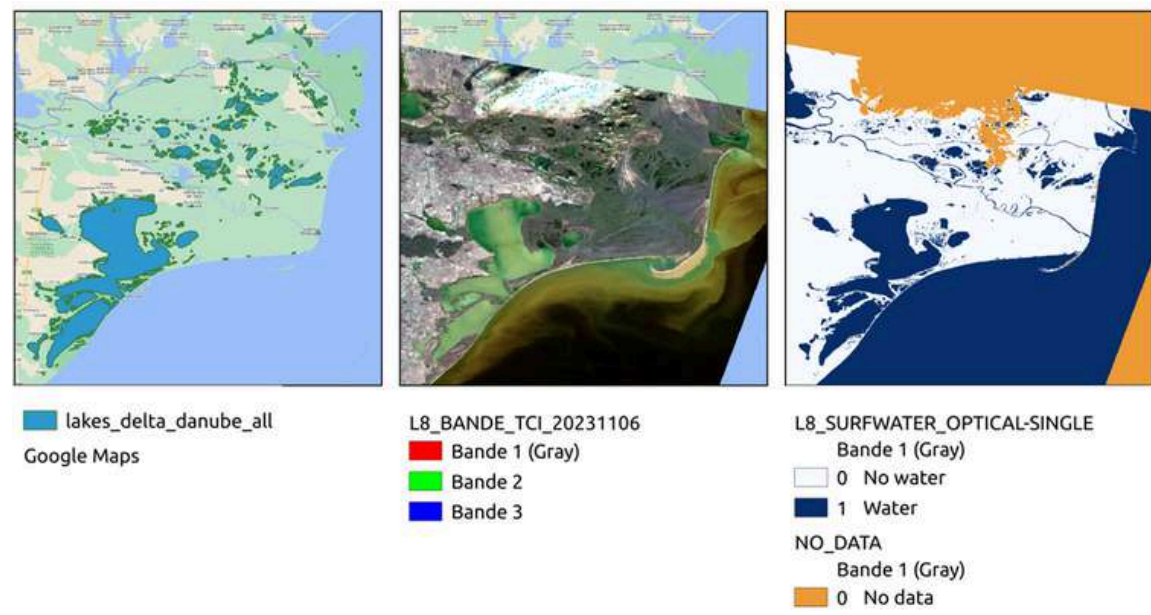
## Leverage all DEDL edge services

- Fresh Data Pool
- HDA
- Stack Dask
- Hook
- Islet



## Enhance the Danube study with varied datasets

- ECMWF's **DT output Climate Adaption** precipitation data from Lumi
  - **Live data** stream from DanubeHIS river stations
  - OPERA Instantaneous Rainfall Rate dataset from **European Weather Cloud**
  - LandSat 8-9 products
  - MERIT Height Above Nearest Drainage
  - Global Surface Water occurrence (Pekel 2016)
- We leverage DEDL edge services to maximize data transfer efficiency.



### Surfwater

An AI-based **water surface detection algorithm**, processing optical or radar satellite data (Sentinel 1-2, Landsat), co-developed by the **CNES** and **CS GROUP**.

### Waterbodies surfaces and volumes estimation

- Extract waterbodies surfaces from the Surfwater mask taking Hydrolakes database as a reference
- Compute volumes with a hydrological modelisation of the waterbody's bathymetry

<https://www.theia-land.fr/product/surfwater-suivi-dynamique-de-surfaces-en-eau/>



## Superset Dashboard

- Effective tool to cross-reference all the data
- Monitor and forecast precipitations
- Analyze long-term waterbodies surface and volume variations
- Empower decision makers with situational assessment capabilities



Demonstration video

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