

Senti-water demo #1

About the problem

We will create data processing system to visualize big water reservoirs in Poland.

The applications of this system:

- database of big water reservoirs with spatio-temporal information
- application for browsing water reservoir data

Our objectives

- Creation of a database and visualization of large water objects in Poland including their main properties: location, water surface area etc.
- Separation of larger and smaller water reservoirs
- Ability to see historical data

About the Sentinel

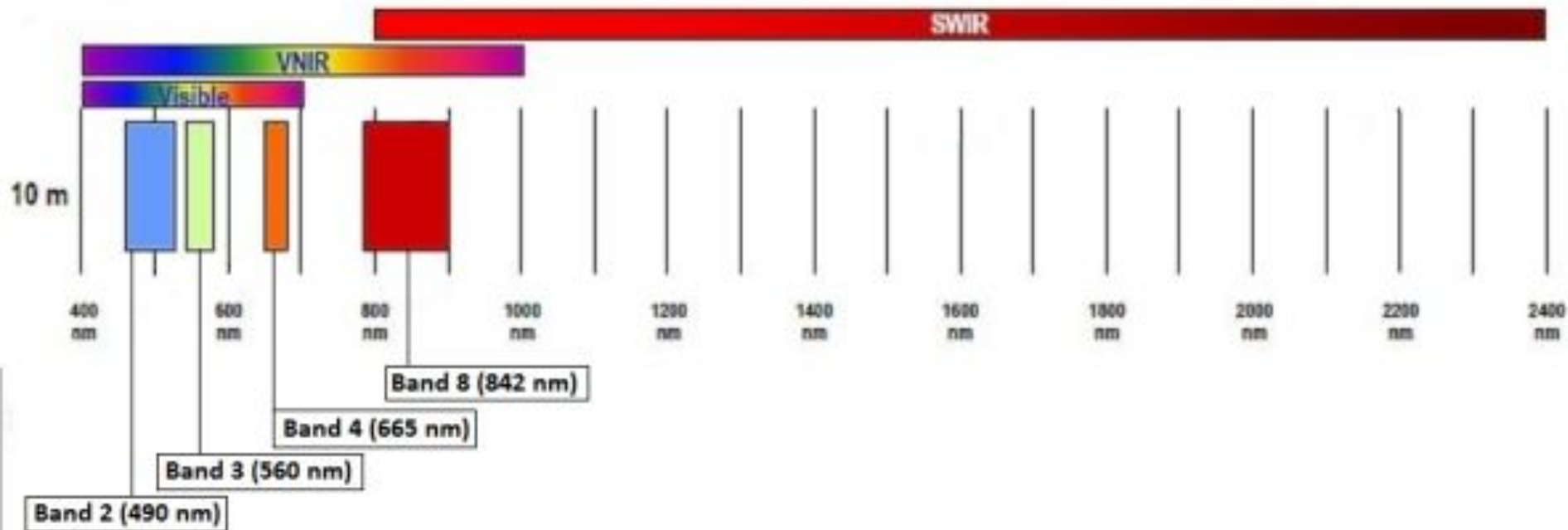
Sentinel is a satellite system with the task of making satellite data publicly available in different frequency bands. It gives images of Poland every 5-6 days.



Sentinel-2

- SENTINEL-2 is a wide-swath, high-resolution, multi-spectral imaging mission, supporting Copernicus Land Monitoring studies
- Including the monitoring of vegetation, soil and water cover, as well as observation of inland waterways and coastal areas
- The SENTINEL-2 Multispectral Instrument (MSI) samples 13 spectral bands: four bands at 10 metres, six bands at 20 metres and three bands at 60 metres spatial resolution.

Sentinel-2 10 m bands



What have we done?

We concluded work on first version of data processing pipeline.

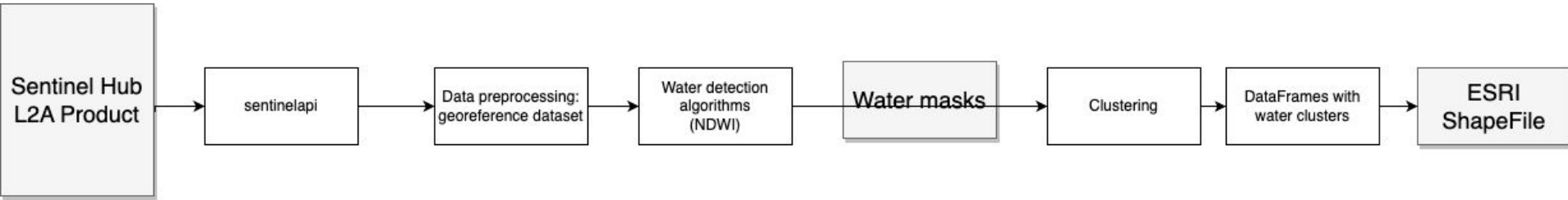
Our pipeline can:

- download an image from the satellite at a specific place and time
- show downloaded data
- calculate the mask of water by subtracting the individual layers (NDWI technique)
- extract water and present it clearly in the satellite image

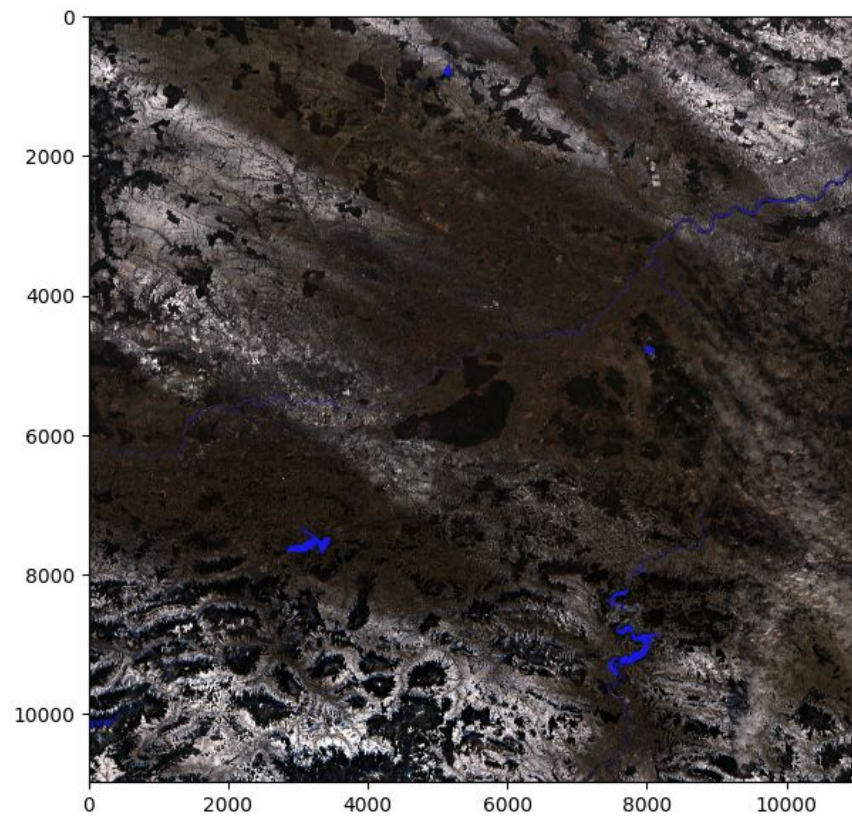
Normalized Difference Water Index

$$NDWI_t = \frac{NIR_t - SWIR_t}{NIR_t + SWIR_t}$$

What have we done?



What have we done?



What we are going to do this week?

- Create a database (DB2 on Cloud + Geo extension)
- Download only the required files (+ preprocessing optimizations)
- Creating an algorithm that calculates the center of a water reservoir
- Designation and simplification of the shape of a water reservoir