

## TSM Products

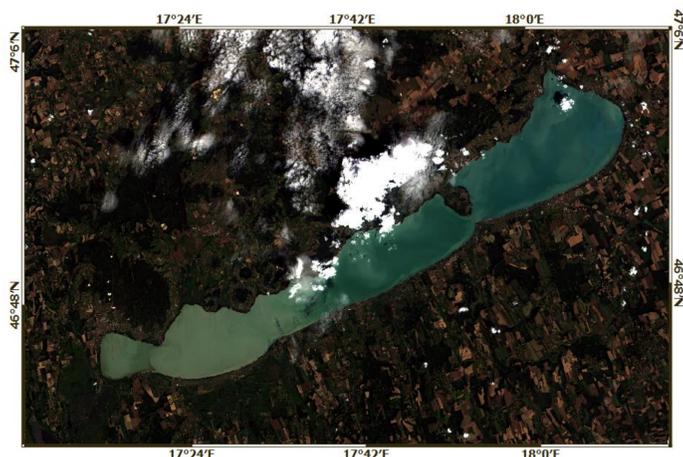
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### AIM

Total Suspended Matter (TSM), which is the amount of organic and inorganic particles suspended in the water, is an important feature for the monitoring of water quality. High TSM concentrations at the surface will lead to a reduction of light in the underlying water layers which affects the aquatic vegetation. But also the transport of TSM, including toxins is important to monitor. Remote sensing can play a role in TSM mapping since TSM is, next to chlorophyll and Coloured Dissolved Organic Matter (CDOM), one of the optically active constituents. Therefore satellite or airborne data can provide useful information about the spatial patterns or historical characteristics of TSM.

### DATA

A Landsat-8 OLI image scene (USGS) of Lake Balaton is selected for TSM mapping. This image was acquired in during the summer (16/07/2014)

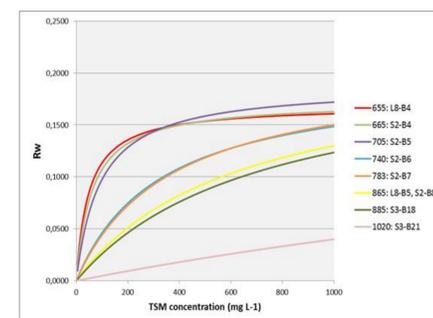


Landsat-8 OLI image: zoom-in on Lake Balaton (16/07/2014)

### METHODOLOGY

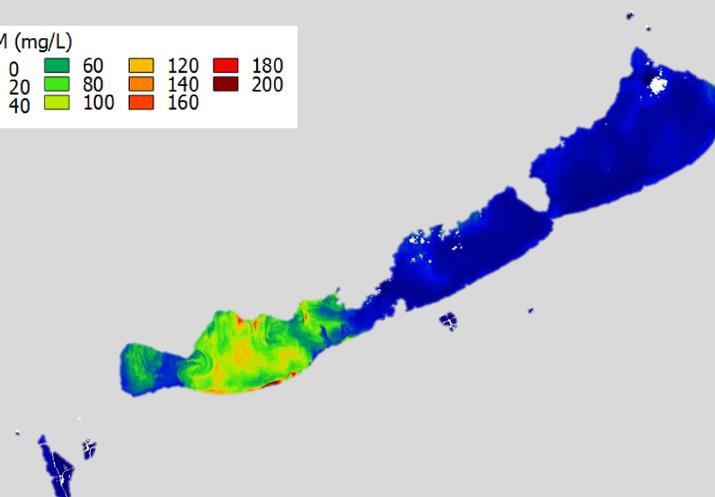
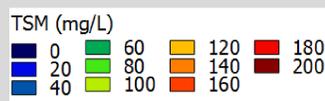
TSM maps can be derived from remote sensing data using a single-band semi-analytical TSM algorithm<sup>1</sup>. However, as becomes visible from the graph, saturation can occur at high TSM values. This saturation effect is wavelength dependent: the longer the wavelength, the higher the TSM value can be before saturation occurs. On the other hand, longer wavelengths are less sensitive for low TSM concentrations. Therefore a multiband wavelength switching TSM algorithm can be the answer.<sup>2</sup>

For the Landsat-8 OLI image of Lake Balaton a single band semi-analytical TSM algorithm<sup>1</sup>, calibrated with in-situ data, is applied. Since lake Balaton is not considered to be extremely turbid, no switching between different wavelengths is required.



### PRODUCTS

The generated product is a TSM map of Lake Balaton. The sediment concentrations range from very low (almost zero) to 200 mg/L in the south-western region. In this region the mean depth is 2.3 m, which is lower than the 3.7 m of the north-eastern part of the lake. Therefore, the bottom sediments are more readily resuspended, increasing the total amount of suspended sediments. An additional contributor can be the Zala river, which flows into the lake in this south-western part.



### REFERENCES

- Nechad, B., Ruddick, K.G., Neukermans, G., 2009. Calibration and validation of a generic multisensor algorithm for mapping turbidity in coastal waters. *SPIE Eur. Remote Sens.* 7473, 74730H–74730H–12.
- Knaeps, E., Ruddick, K.G., Doxaran, D., Dogliotti, a. I., Nechad, B., Raymaekers, D., Sterckx, S., 2015. A SWIR based algorithm to retrieve total suspended matter in extremely turbid waters. *Remote Sens. Environ.* 168, 66–79.