

A near-shore phytoplankton bloom in Belgian waters observed from space

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Summary The Belgian coastal zone was imaged by Sentinel-2 on the 1st of May 2016. Thanks to the 665 nm (red) and 705 nm (red-edge) bands on Sentinel-2, the chlorophyll a absorption and hence concentration can be derived, here revealing an intense phytoplankton bloom in front of Oostende. Due to the bloom's extent and the shallow water depth, it would be nearly impossible to detect or sample using ship-borne measurements. The red-edge band also allows for an estimate of water turbidity that is unaffected by chlorophyll a absorption.

Conclusion We demonstrate that Sentinel-2 will contribute to the understanding of small scale phytoplankton dynamics and sediment transport in the coastal zone. Sentinel-2 data will be of significant importance for Water Framework Directive monitoring requirements.



Figure 1 Sentinel-2A/MSI Rayleigh-corrected RGB composite of the Belgian coastal zone on 2016-05-01 (10:53 UTC). Common sampling stations are annotated.

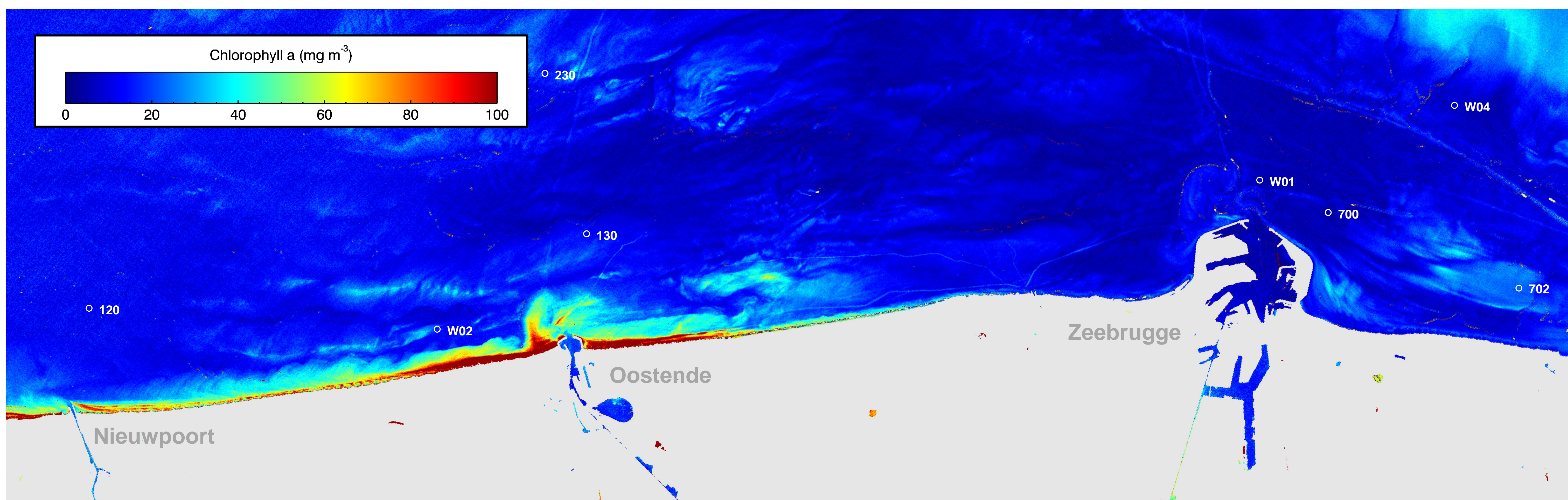


Figure 2 Chlorophyll a concentration derived using the algorithm of Gons (2005), showing an intense bloom between Nieuwpoort and Oostende

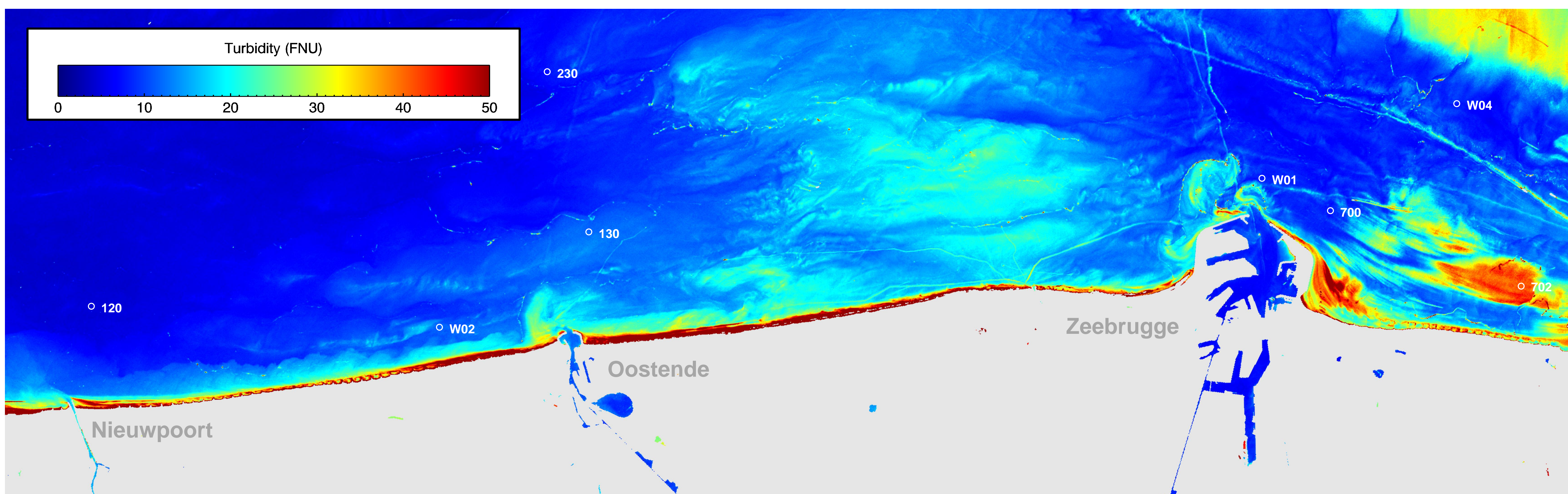


Figure 3 Water turbidity derived from the 705 nm band using the algorithm of Nechad et al. (2009)