Applications of (very) high resolution optical satellite data in coastal waters

Quinten Vanhellemont and Kevin Ruddick

Royal Belgian Institute of Natural Sciences (RBINS), Gulledelle 100, 1200 Brussels, Belgium, [quinten.vanhellemont@naturalsciences.be](mailto:quinten.vanhellemont@naturalsciences.be)

In contrast to moderate resolution (>250 m) satellite sensors, high resolution satellite (<1-100 m) sensors can spatially resolve coastal processes, sea surface effects (sun/sky glint, waves, foam, floating vegetation or blooms), and impacts of human activities. Additionally, high resolution data can be used for assessing or even characterizing validation sites for moderate resolution satellites that still have the big advantage of near-daily revisit times. The question to what extent the measurement platforms or ships themselves influence the signal measured by the satellite might be answerable with high resolution data (Ruddick et al., 2014).

This poster will present some of the new applications that have become apparent since the launch and free distribution of high quality imagery from the Operational Land Imager (OLI) on Landsat-8. With 30 m imagery, the monitoring of the near-shore environment, offshore constructions, dredging and shipping activities, and small scale sediment transport becomes feasible (Vanhellemont and Ruddick, 2015, 2014). Landsat-8 imagery is used to delineate areas of high spatial variability within typical moderate resolution pixel sizes in Belgian coastal waters, and the impact of fixed structures and ships is assessed. Very high resolution imagery from Pléiades (2.8 m resampled to 2 m) reveals high spatial variability in surface suspended matter concentration even within 30 m pixels. Spatially resolved waves, glint, foam, objects and their shadows represent new processing challenges for high resolution data. A proper cloud and cloud shadow masking becomes important for high resolution imagery.

References

Ruddick, K., Vanderzande, D., Vanhellemont, Q., 2014. Multi-sensor ocean colour validation in Belgian waters, in: Proceedings of the Ocean Optics XXII Conference Held in Portland, USA, 26-31 October 2014.

Vanhellemont, Q., Ruddick, K., 2015. Advantages of high quality SWIR bands for ocean colour processing: examples from Landsat-8. Remote Sens. Environ. 161, 89–106. doi:10.1016/j.rse.2015.02.007

Vanhellemont, Q., Ruddick, K., 2014. Turbid wakes associated with offshore wind turbines observed with Landsat 8. Remote Sens. Environ. 145, 105–115. doi:10.1016/j.rse.2014.01.009