A new AERONET-OC site for the northern North Sea

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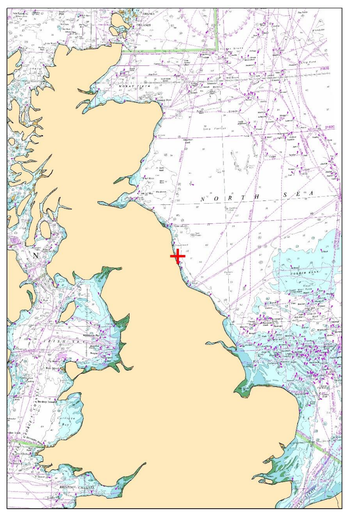
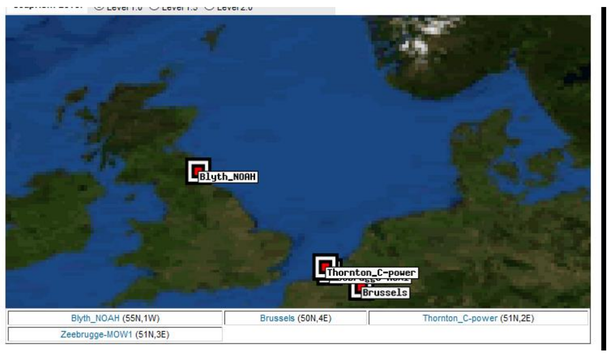
Abstract

The need for high-frequency, high-quality optical measurements at sea level to support and validate satellite measurements of ocean colour has long been recognised (Zibordi, Berthon, et al. 2009). With the aims of creating new satellite products for Sentinels 2 and 3, and greatly increasing the availability of marine *in situ* data for validation, the HIGHROC proposal was submitted to Framework 7, and subsequently received funding for four years. In work package 5 of the project, a large dataset of *in situ* measurements of water quality will be generated using automated SMARTBUOY and FERRYBOX systems to generate high quality measurements of parameters such as suspended sediment load, chlorophyll concentration and underwater light penetration. These are the types of data which are typically used in national assessments of water quality, and in Environmental Statements by maritime industry. Utilisation of automated *in situ* measurements can greatly increase the number of match-ups with satellite data (Neukermans et al. 2012).

In addition to the in-water measurements, readings of the radiance leaving the water surface are very important for satellite validation (Zibordi, Mélin, et al. 2009, Zibordi et al. 2015). The water-leaving radiance (Lw) is equivalent to the radiance measured by a satellite after correction for attenuation of light in the atmosphere. There are at present no suitable operational measurements of Lw in UK waters, indeed there were none in the whole of the North Sea prior to HIGHROC. To improve the coverage of sea-level radiance in the North Sea, Cefas and the University of Hull are working together with the Offshore Renewable Energy Catapult centre in the development of an AERONET ocean-colour measuring station to be located at an experimental meteorological tower in the northern North Sea. .



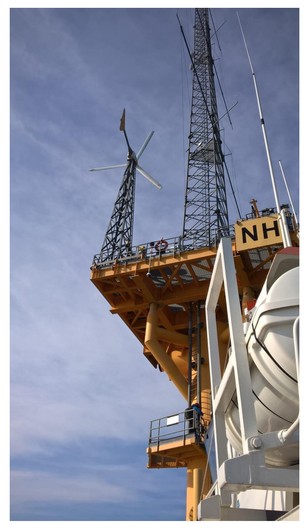


HIGHROC contributes to AERONET-OC with three new sea-truth sites in the North Sea; Thornton_C_Powert, Zeebrugge and Blyth_NOAH.

Sentinel 2a scene

Landsat 8 scene

NOAH tower



Site Coordinates and Elevation:

Latitude: 55.14640° North
Longitude: 1.42086° West
Elevation of sensor: 19.0 Meters Depth of water: 35m

Site Description:
The original purpose of the Offshore Anemometry Hub (NOAH) is to characterise wind and ocean conditions for the Blyth Offshore Demonstrator, the demonstration offshore wind farm that ORE Catapult is developing close to Blyth.

Platform at 19m AMSL (AERONET location)
Mast Tip at 104m AMSL 10m x 10m Deck (+ Extension)
25 Year Design Service Life
Wind/PV primary power with Diesel Genset backup
Dedicated microwave link and CCTV observation

Instrument control

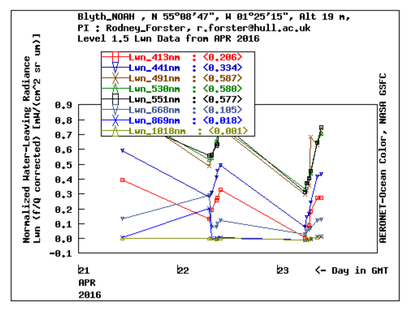
Panel-PC

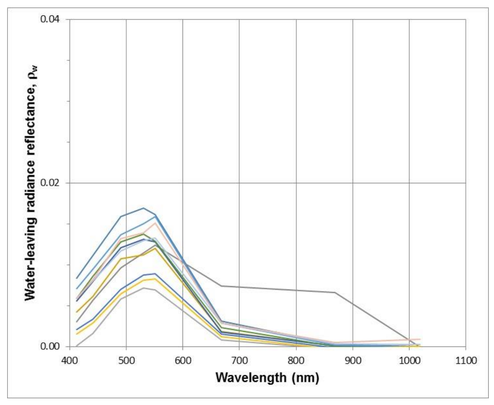
CIMEL control

UPS power

Station in operation

Initial results





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Presented at the Sentinel-2 for Science Workshop, ESA-ESRIN, Frascati, Italy, 20-22 May 2014

The HIGHROC project is funded by the European Community's Seventh Framework Programme (FP7/2007-2013) under grant agreement n° 606797.