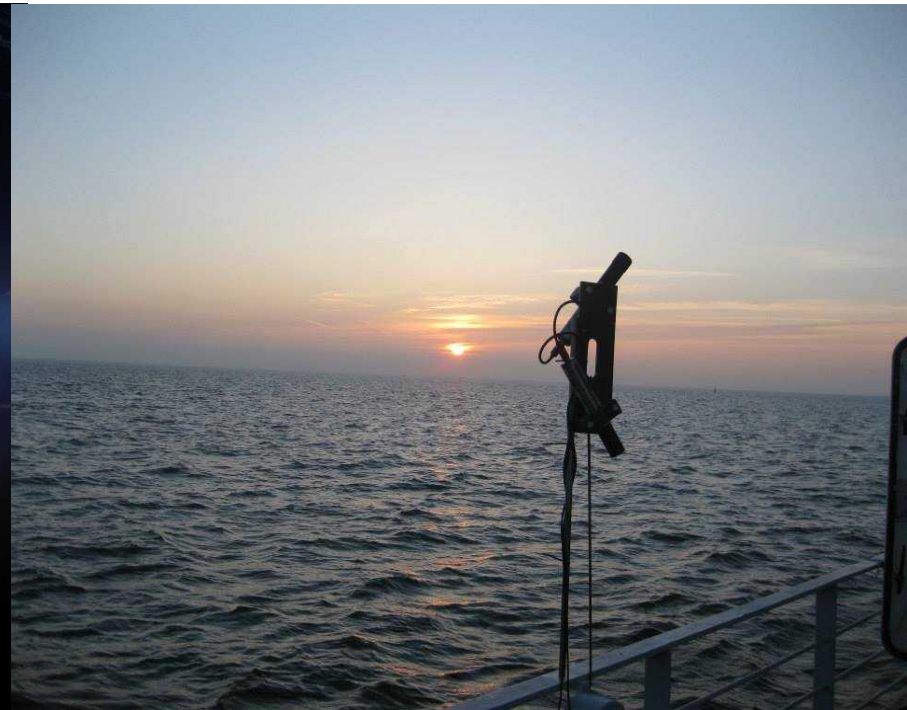


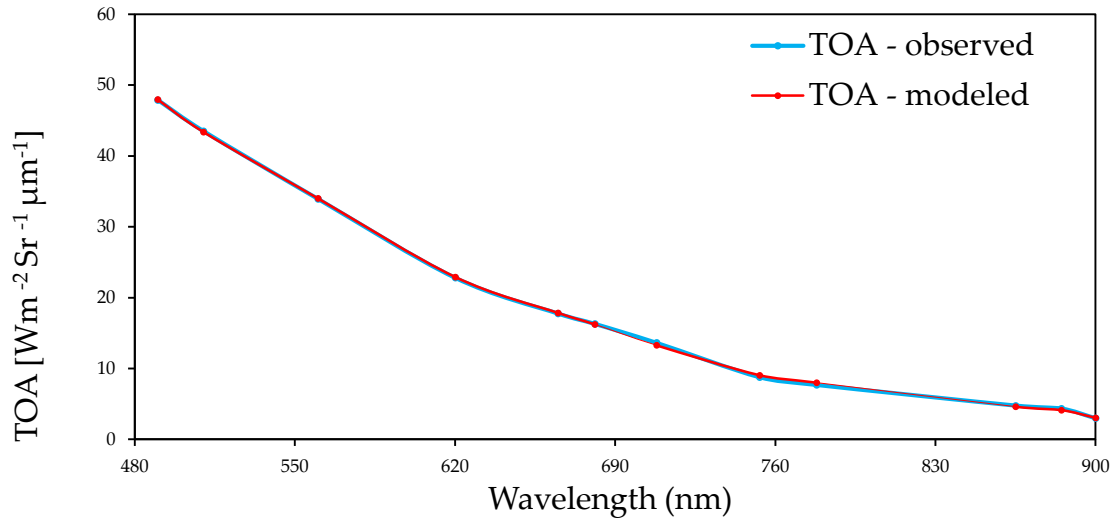
**Remote Sensing of Water Quality in the Wadden Sea
(Combining multi-sensor satellite images and in-situ measurements)**

Boussinesq Lecture 2019

**Amsterdam
October 2019**



Pixel TOA vs simulated TOA



Optimization

0.03

Measured R_{rs}

Chla

SPM

CDOM

Visibility

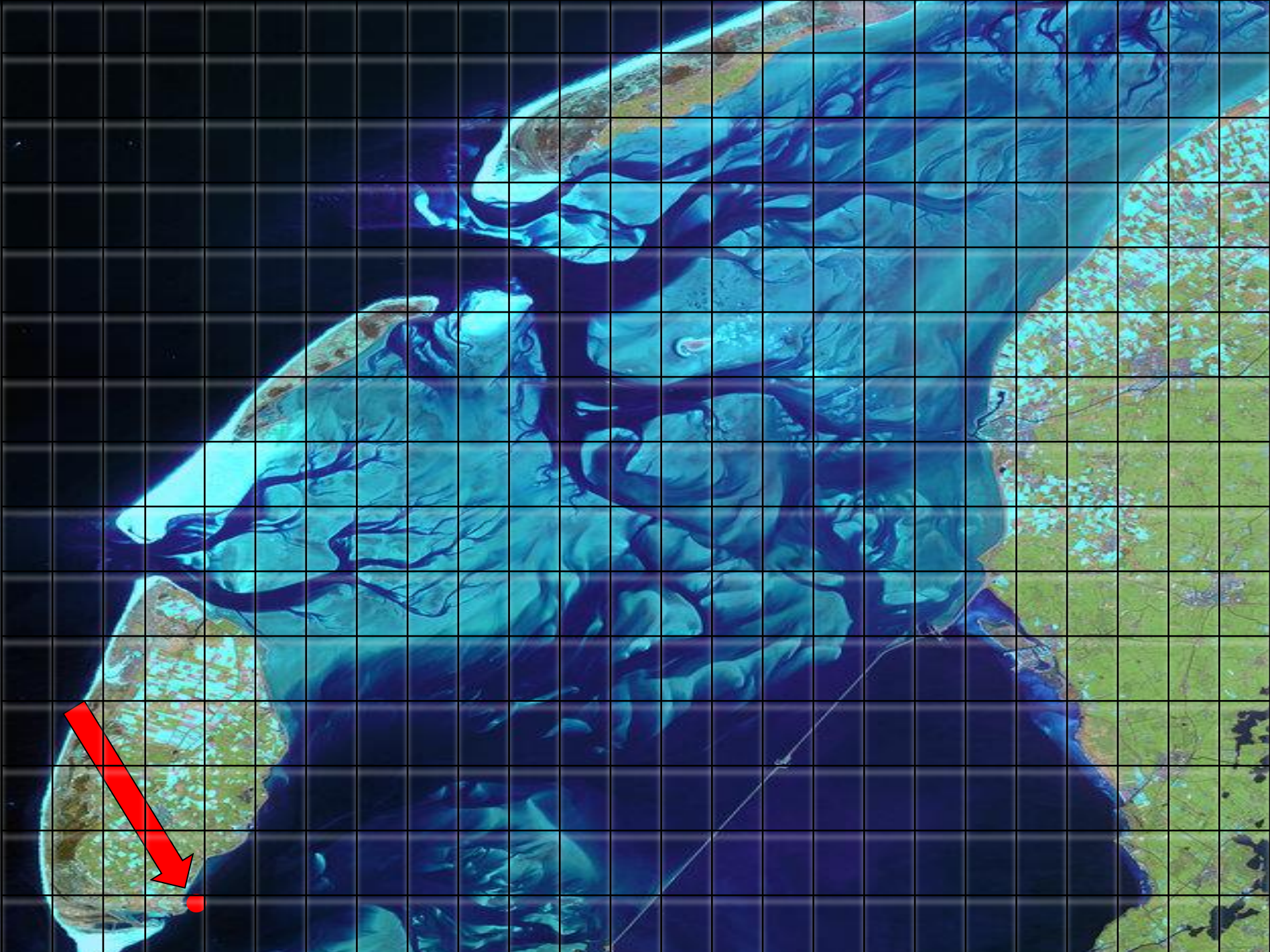
Aerosol type

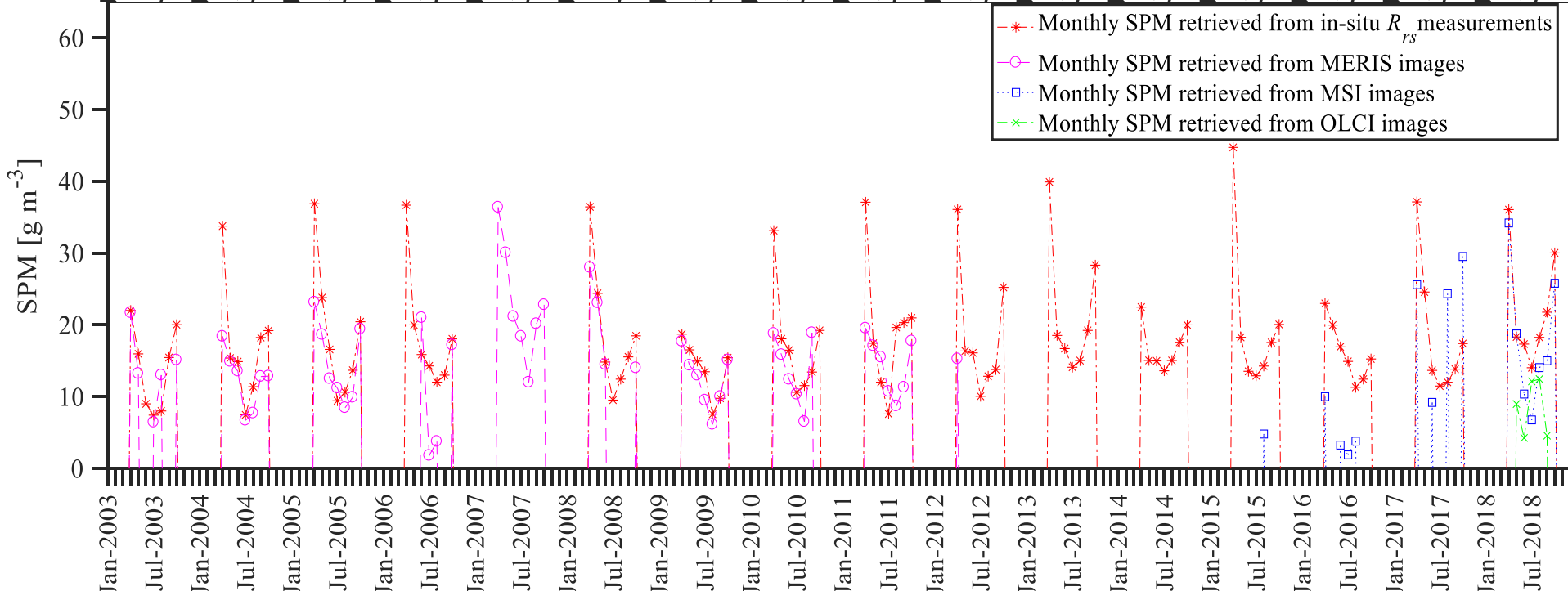
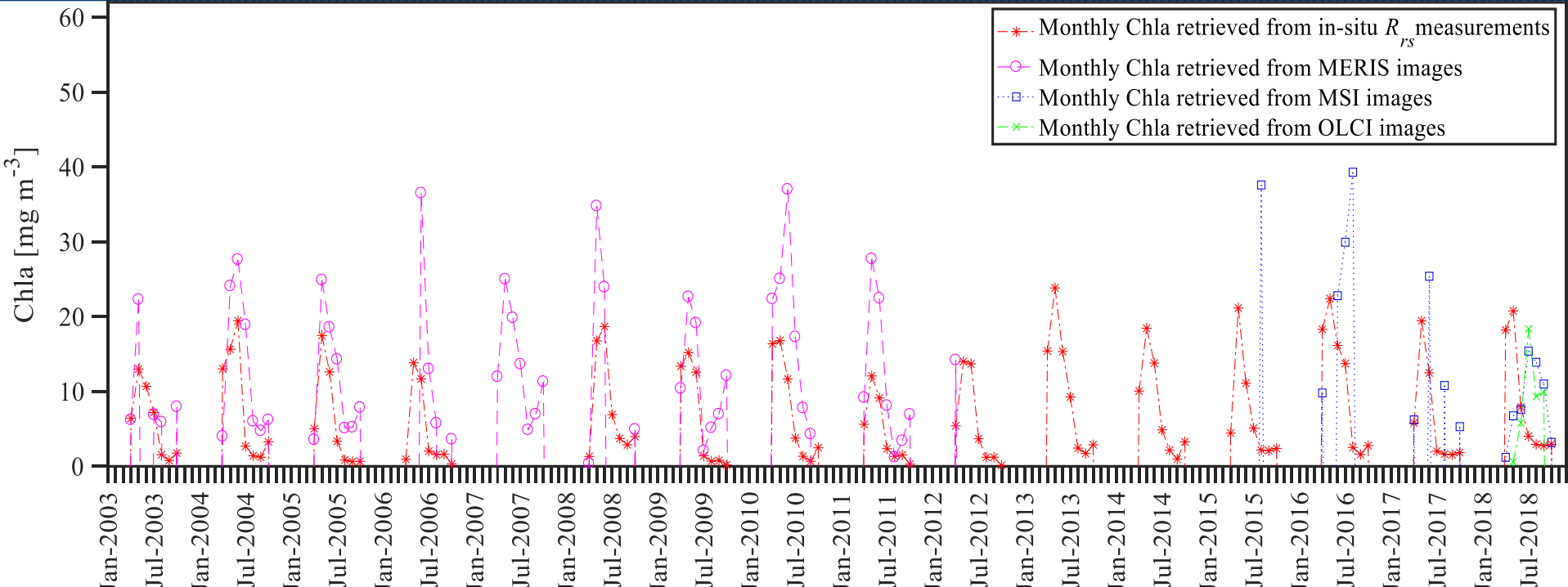
RMSE



Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image Landsat / Copernicus

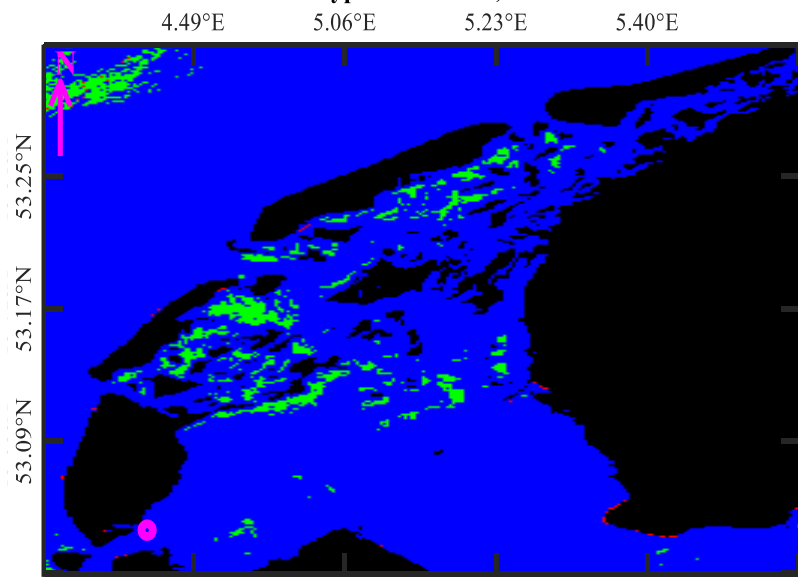
Google Earth



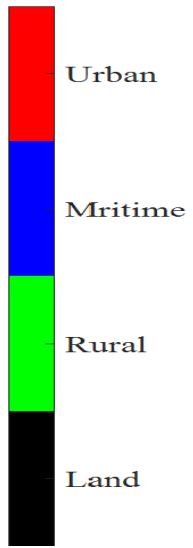
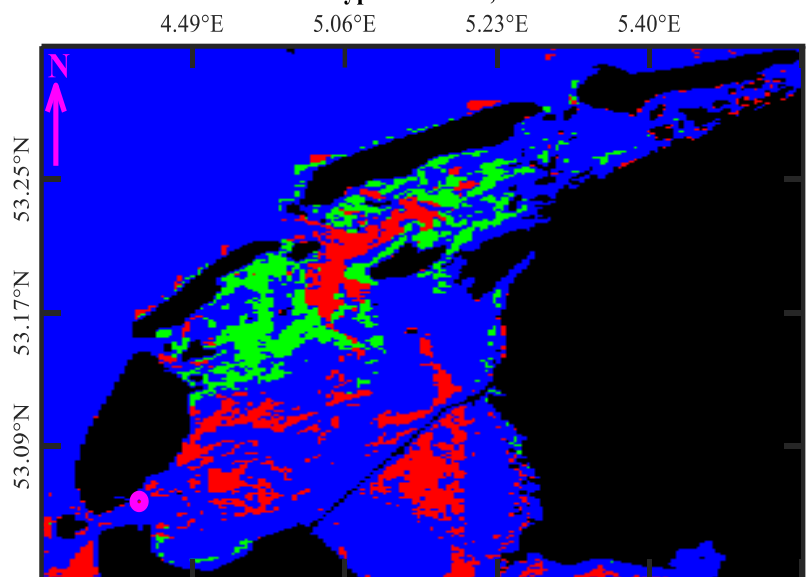


Generate Maps

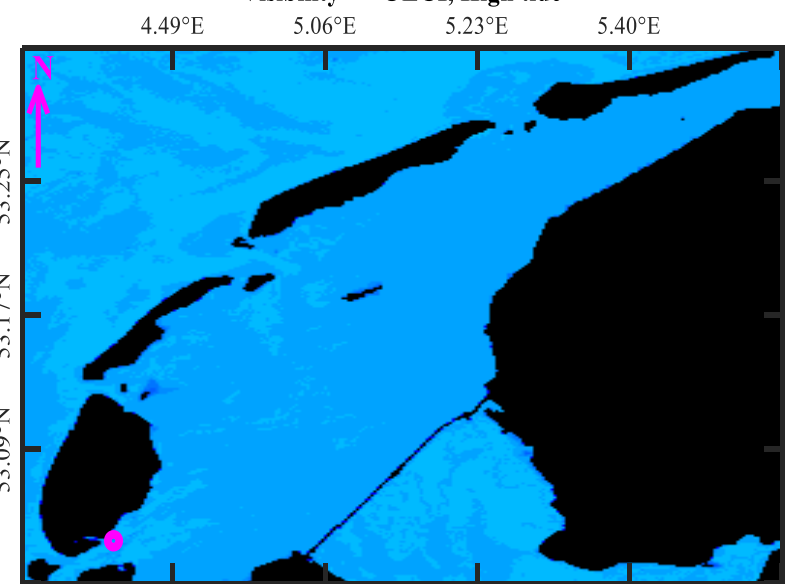
Aerosol type => MERIS, Low tide



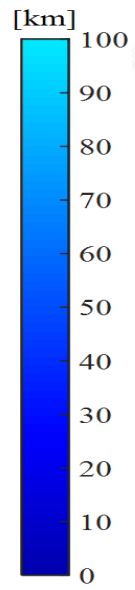
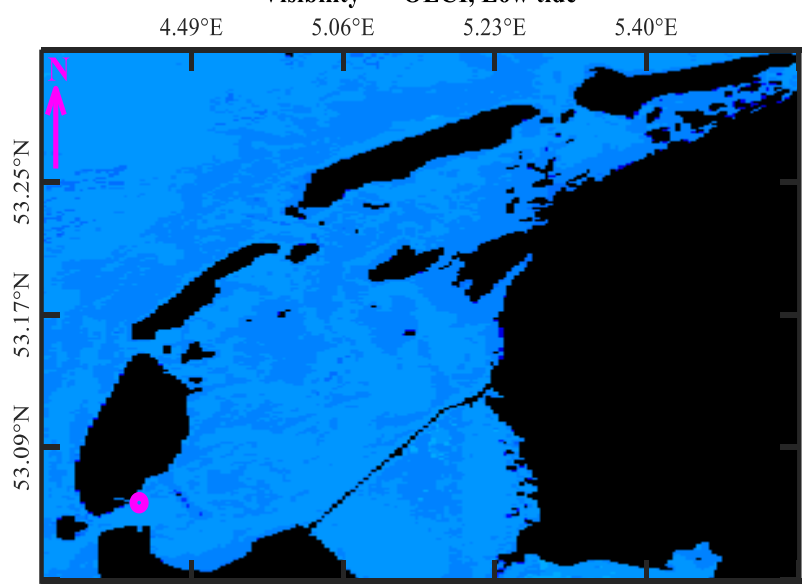
Aerosol type => OLCI, Low tide



Visibility => OLCI, High tide



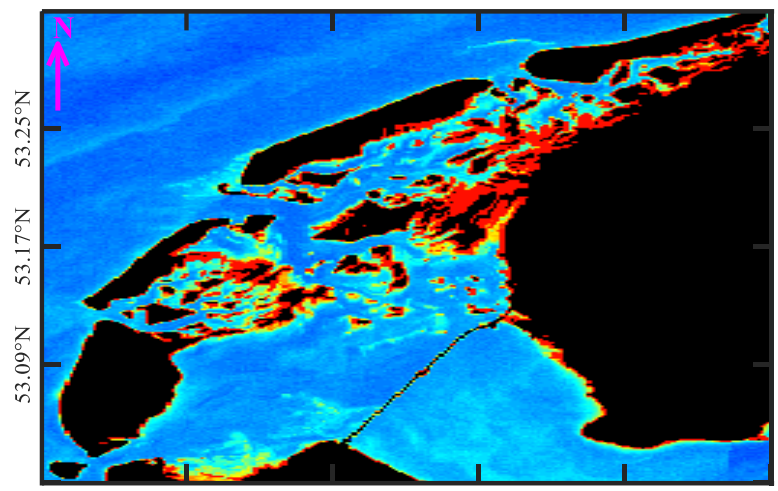
Visibility => OLCI, Low tide



Spectral Residual Error Maps

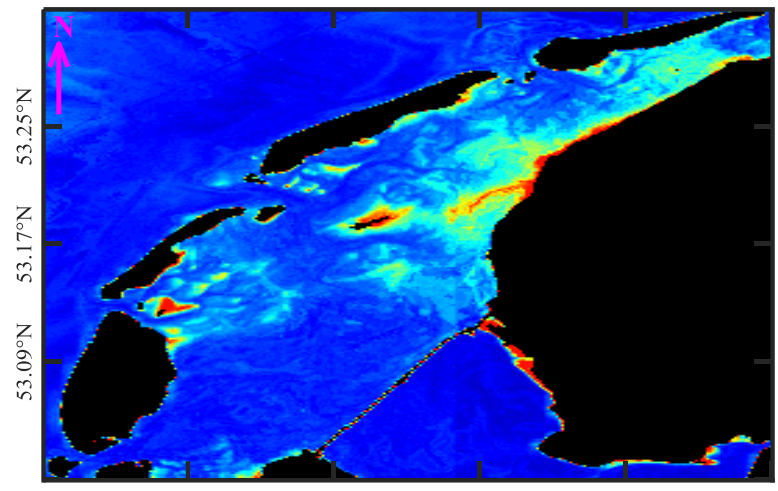
RMSE(%), without NIBEI => MERIS, Low tide

4.49°E 5.06°E 5.23°E 5.40°E

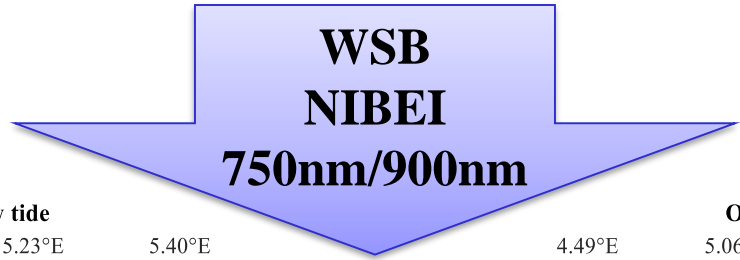
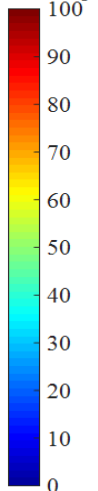


RMSE(%), without NIBEI => OLCI, High tide

4.49°E 5.06°E 5.23°E 5.40°E

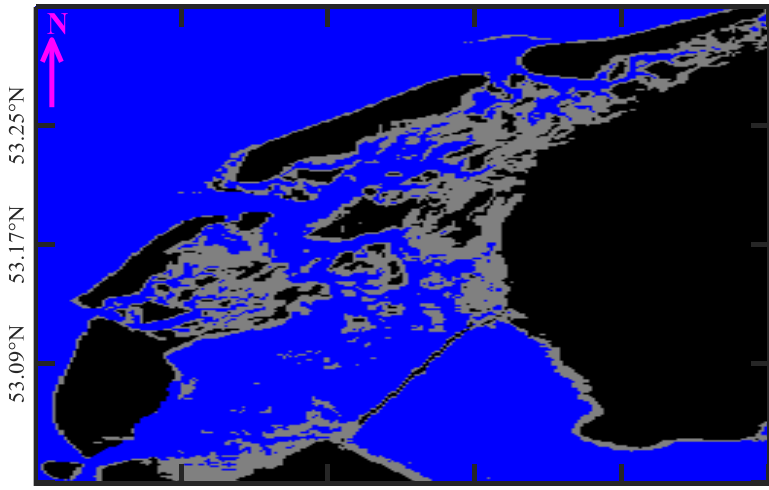


[RMSE*100]



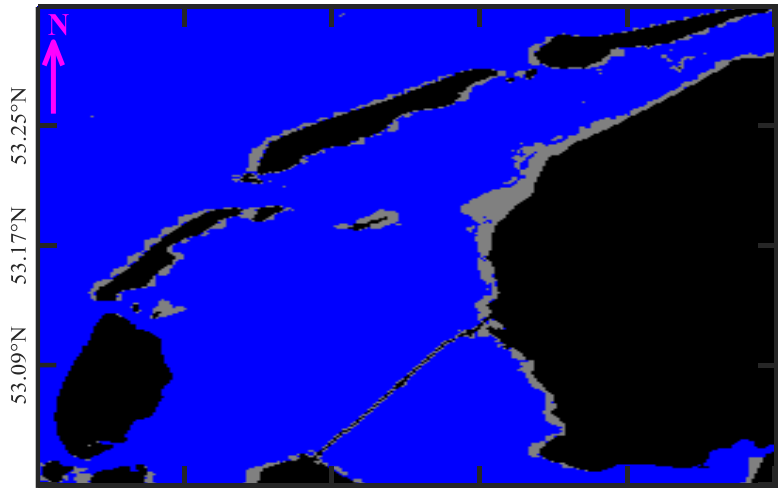
MERIS, Low tide

4.49°E 5.06°E 5.23°E 5.40°E



OLCI, High tide

4.49°E 5.06°E 5.23°E 5.40°E



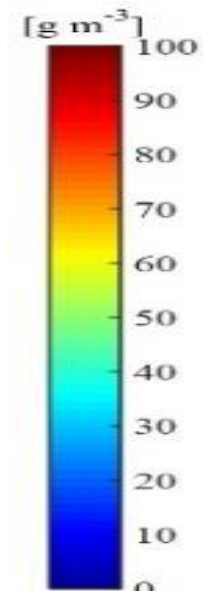
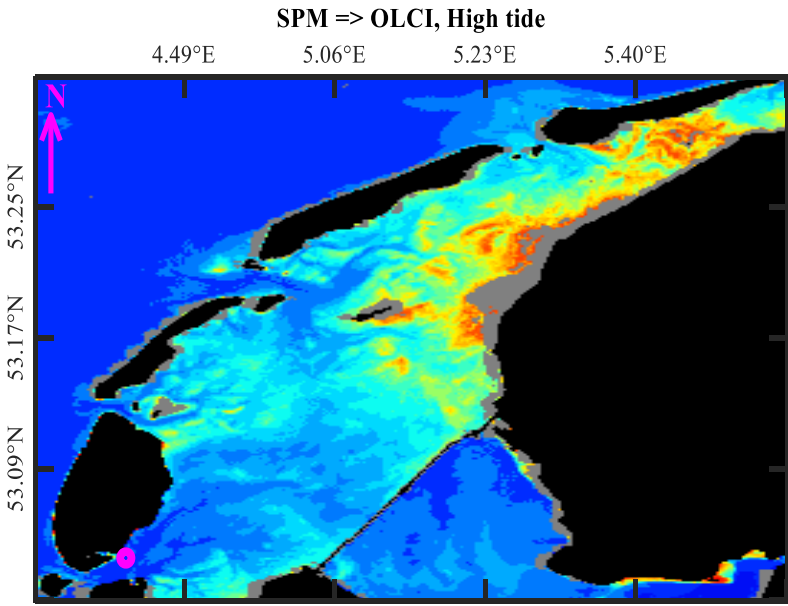
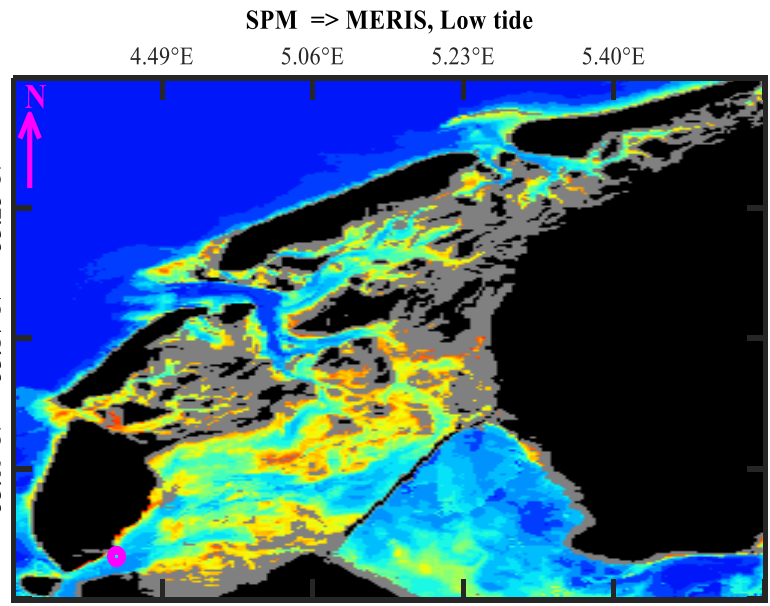
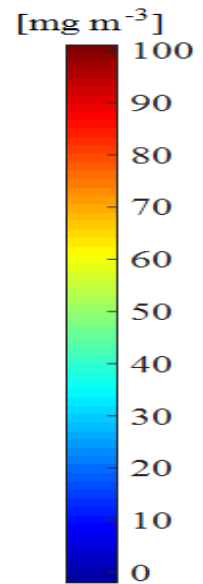
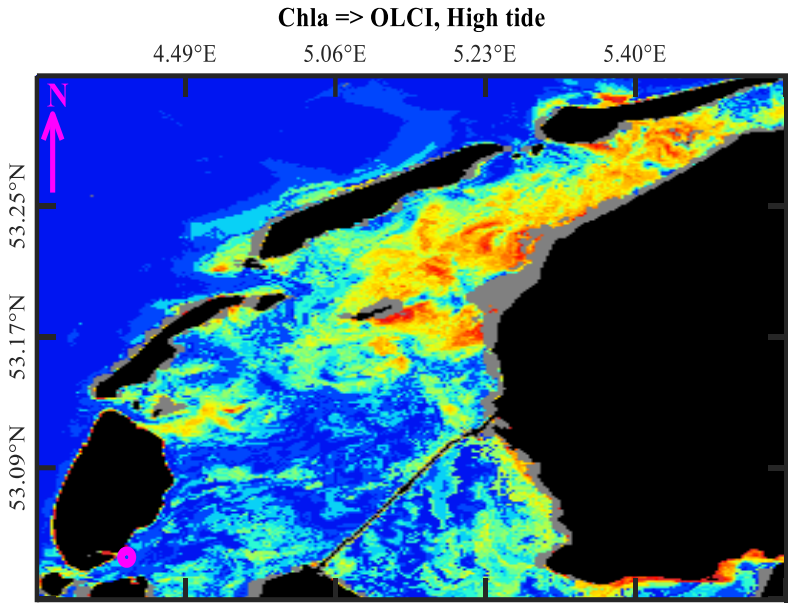
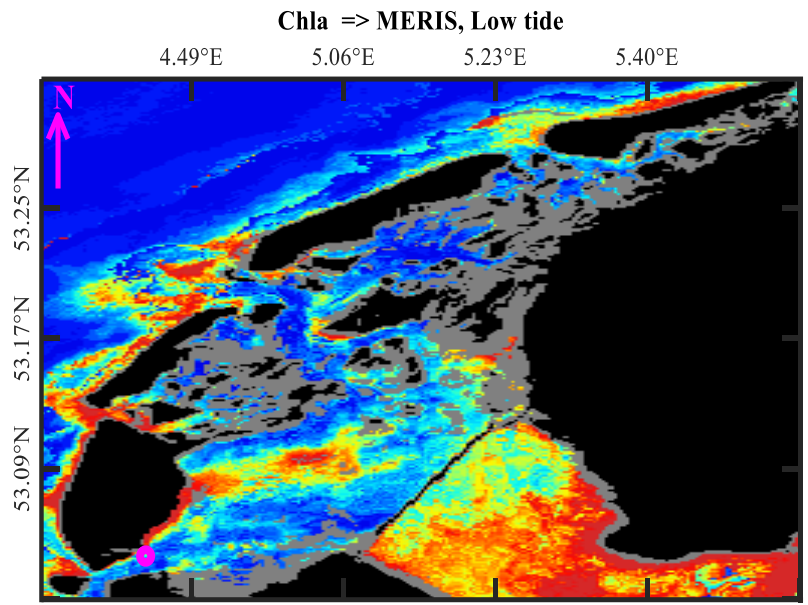
Shallow areas

Deep waters

Land



Generate Reliable Maps





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Remote sensing of water constituent concentrations using time series of in-situ hyperspectral measurements in the Wadden Sea



Behnaz Arabi^{a,*}, Mhd Suhyb Salama^a, Marcel Robert Wernand^b, Wouter Verhoef^a



remote sensing



Article

MOD2SEA: A Coupled Atmosphere-Hydro-Optical Model for the Retrieval of Chlorophyll-a from Remote Sensing Observations in Complex Turbid Waters

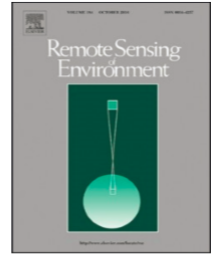
Behnaz Arabi^{1,*}, Mhd. Suhyb Salama¹, Marcel Robert Wernand² and Wouter Verhoef¹



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Integration of in-situ and multi-sensor satellite observations for long-term water quality monitoring in coastal areas



Behnaz Arabi^{a,*}, Mhd. Suhyb Salama^a, Jaime Pitarch^{b,c}, Wouter Verhoef^a



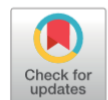
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The impact of sea bottom effects on the retrieval of water constituent concentrations from MERIS and OLCI images in shallow tidal waters supported by radiative transfer modeling



Behnaz Arabi^{a,*}, Mhd. Suhyb Salama^a, Daphne van der Wal^{a,b}, Jaime Pitarch^c, Wouter Verhoef^a

THANK YOU

And

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Prof. Daphne van der Wal - Prof. Wouter Verhoef - Dr. Suhyb Salama

