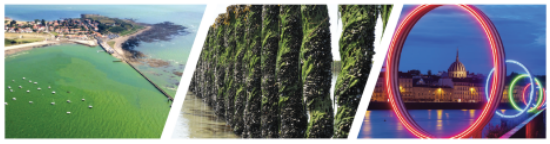

THE 18TH INTERNATIONAL CONFERENCE ON HARMFUL ALGAE
FROM ECOSYSTEMS TO SOCIO-ECOSYSTEMS

ICHA 2018
21 – 26 OCTOBER
NANTES, FRANCE

Optical sensors and drone systems for the monitoring of harmful blooms
ICHA2018/301

Forecasting cyanobacterial blooms using high frequency monitoring data

Anouk Blauw* [1], Henk van den Boogaard[1], Annelies Hommersom[2], Floris Bogaard[3], Rui Lima[4], Jannes Schenkel[5], Elena Uibel[5], Marieke Eleveld[1], Lilith Kramer[1], Valesca Harezlak[1], Miguel Dioniso[1]

[1]Deltares, Delft, [2]Water Insight, Wageningen, [3]Tauw, [4]INDYMO, Delft, [5]waterschap noorderzijlwest, groningen, Netherlands
**Presenting author*

Select your prefered type of presentation: Oral or poster
Second topic: Biological oceanography and limnology of HABs

Abstract: Cyanobacterial blooms can be toxic to humans swimming in affected waters. According to the European Bathing Water Directive bathing waters should be closed during cyanobacterial blooms. In the Netherlands, cyanobacteria monitoring in all official bathing water locations is usually performed every two weeks during the bathing season. In face of the large temporal and spatial variability of cyanobacterial bloom dynamics this monitoring frequency however is too low for adequate early warnings to the public. High frequency monitoring and forecasting models can provide information on cyanobacterial blooms in between the regular monitoring dates and for a few days into the future. In the H2020 project EOMORES, we have combined observational data from a spectral camera (Ecowatch) near a Dutch bathing site with fluorescence data from an underwater drone to analyse the variability of cyanobacterial blooms at short temporal and spatial scales. The results are used in a short term forecasting model of cyanobacterial blooms (AlgaeRadar) and a 3D scum forecasting model (EWACS). The AlgaeRadar is cross-validated with biweekly data from other bathing water sites and shows improved model performance compared to an earlier version that was built with only biweekly data. For the site with high-frequency chlorophyll observations the near-real time data are assimilated in the model to further enhance the model performance. Model performance of EWACS is verified using high frequency pictures from the Ecowatch station, showing scum layers on the water. This allowed us to validate and calibrate the EWACS model. Model validation abilities were in the past also limited by to the patchy nature and high temporal variability of the scum layers, which was not covered by sparse scum observations. With the resulting models, early warnings for cyanobacterial blooms are more reliable than those from the current practice that are merely based on biweekly monitoring data. For the protection of public health this provides better opportunities as well.

Keywords: data assimilation, hyper-spectral camera, temporal and spatial variability