

MONOCLE - Multiscale Observation Networks for Optical monitoring of Coastal waters, Lakes and Estuaries

Oliver Clements, Plymouth Marine Laboratory, Prospect Place, Plymouth, UK

olcl@pml.ac.uk

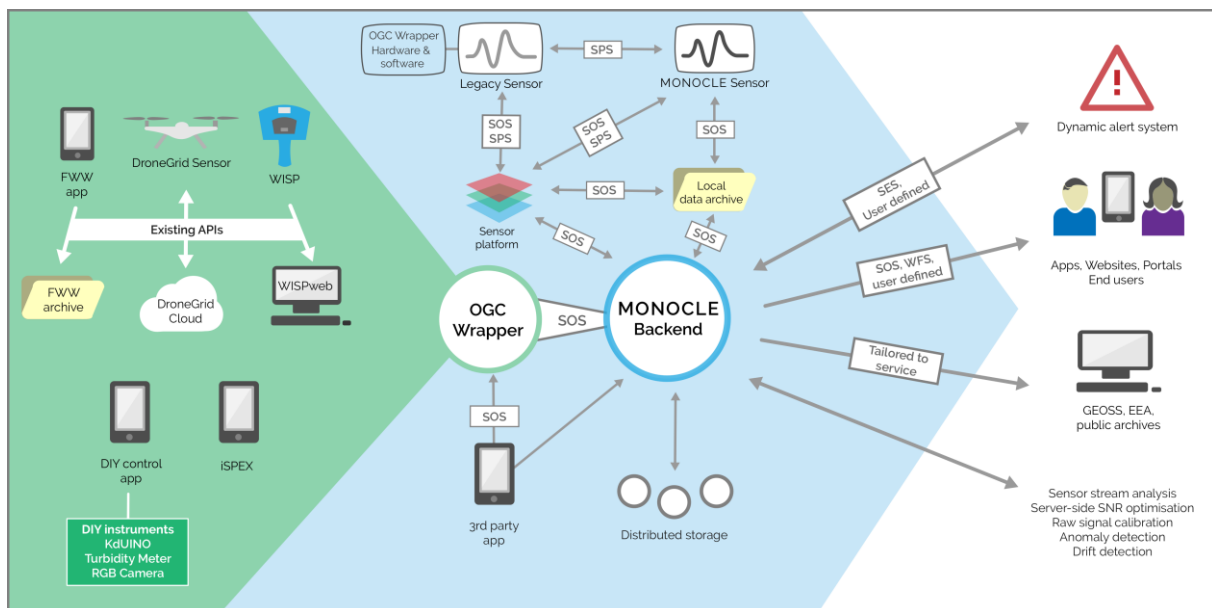
Kathrin Poser, Water Insight, Marijkeweg 22, 6709 PG Wageningen, The Netherlands

poser@waterinsight.nl

Abstract

The aim of MONOCLE is to implement enabling technologies for the deployment, management and maintenance of in-situ sensors and sensor networks, to ultimately reduce uncertainties associated with the retrieval of water quality information from satellite observations. MONOCLE will introduce new sensor technological development across a range of innovative platforms, combining high-end reference sensors in a spatially sparse configuration with a complementary network of low-cost sensors including smartphones and unmanned aerial vehicles (UAV or drones) measuring a range of optical and water quality parameters.

Figure 1: Concept service architecture for the MONOCLE system



The MONOCLE system will be based primarily on Open Geospatial Consortium Sensor Web technologies. We will use Sensor Observation Service for the bulk of data transmission, both from sensor networks to the MONOCLE back-end storage system and from the back-end to sensors with the aim of also having direct sensor to sensor communication. The purpose of having data transmission back to the sensors and between sensors is to create a truly interactive sensor network. Backend-to-sensor interactivity will allow features such as updating measuring schedules around satellite overpasses or triggering a self-calibration of a sensor. Sensor-to-sensor interactivity will allow more sophisticated features that will help make the

network more autonomous such as changing sample rates based on a threshold of the same or another sensor or simply turning a sensor on or off based on another variable. We also plan on further utilising standard interfaces to allow an event, planning and alert system. We are currently assessing the PubSub interface for use in these tasks.

To allow for the direct communication between sensors and the SOS architecture we will be producing a hardware wrapper. The wrapper will allow existing sensors to send the data that they collect via serial interface. The data will then be sent over a mobile internet connection directly to the SOS. As part of the project we are working with a number of sensor manufacturers with the aim of open sourcing both the software and hardware parts of the wrapper.

We will present our experiences so far from an implementation and use perspective. We will also present our results and challenges faced during our first field campaign where we aim to have multiple sensors all talking to the same MONOCLE system with data flow in both directions.