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Water Quality Sensors

Sesnsors were used for real-time continuous monitoring and in-situ evaluation (profiles).

Context

Continuos and in-situ monitoring enables to extend the temporal and spatial frequency of water quality monitoring. Despite the advantages of using optical sensors, their applicability depends on operation, maintenance and calibration to ensure representativeness and to properly indicate the water quality characteristics of the reservoir.

Objectives/Goals

➢ Evaluate the use of different sensors for water quality monitoring.
➢ Compare data from sensors and laboratory analysis for calibration and validation of the resuts.

Methods and Equipments

Different sensors were used for the water quality monitoring, considering real-time continuous monitoring (installed at a plataform at inlet) and for in-situ evaluation (profiles during field campaings) [see sensors and application bellow]. The frequency of the profiles perfomed is indicated at the table bellow.

Results

➢ Nitrate and chloroplyll-a showed good correlation between sensors results and grab samples collected at inlet.
➢ A peak not followed by the laboratory analysis was observed for dissolved organic carbon. After this period some problems were observed in taste an odour at water supply treatment plant.


	U-53	AP-800	CTD	LISST-100 X / 200X	nanoFlu	OPUS	Fluroprobe
Brand	HORIBA	AQUAREAD water monitoring instruments	SonTek	SEQUOIA	TriOS Optical Sensors		bbe moldaenke
Use	Profiles	Profiles	Profiles	Profiles	Continuous monitoring	Profiles and continuous monitoring	Profiles and contínuos monitoring
Parameters	DO, pH, and conductivity	DO, pH, and conductivity	Conductivity Temperature Depth	Sediment size distribution	CDOM and Chlorophyll-a	Nitrate, CODeq, BODeq, DOCeq, and TOCeq	total chlorophyll, green algae, cyanobacteria, diatoms/brown algae, cryptophytes, fingerprints

Profiles	2018									2019	
	21-fev	3-abr	24-abr	8-mai	12-jun	13-aug	25-oct	20-nov	11-dec	5-fev	2-abr
U53-Horiba		o	o	o	o						
AP800-Aquaread							o	o	o	o	
CTD-Sontek	o	o	o	o	o	o		o	o	o	o
Fluoroprobe	o			o			o	o	o	o	
Opus-Trios		o	o	o	o	o		o	o	o	o

Figures: Variation of DOC (dissolved organic carbon – adjusted, raw equipament value and laboratory); Nitrate concentration (sensor and laboratory analysis); Chlorophyll –a (sensor and laboratory)
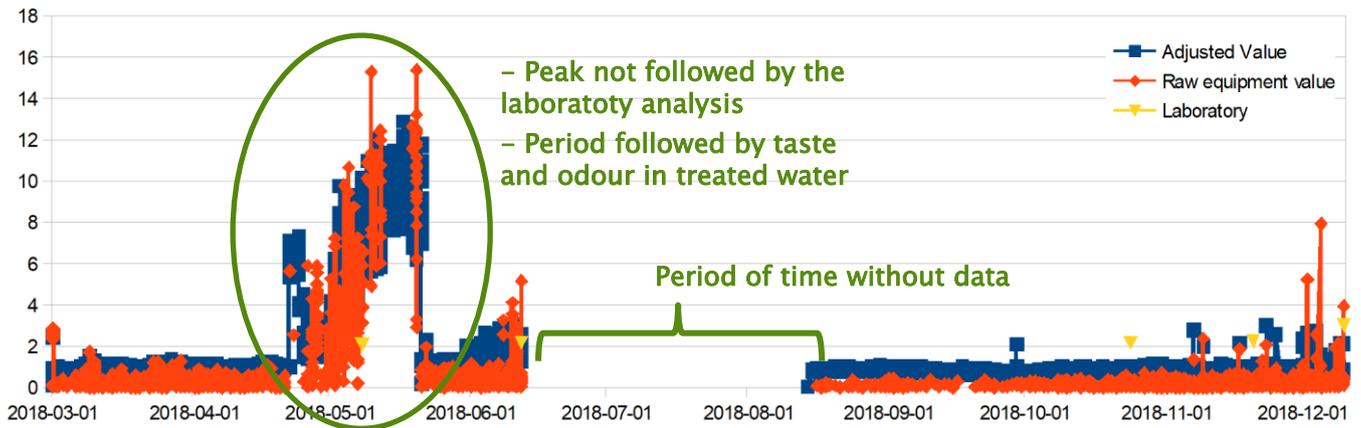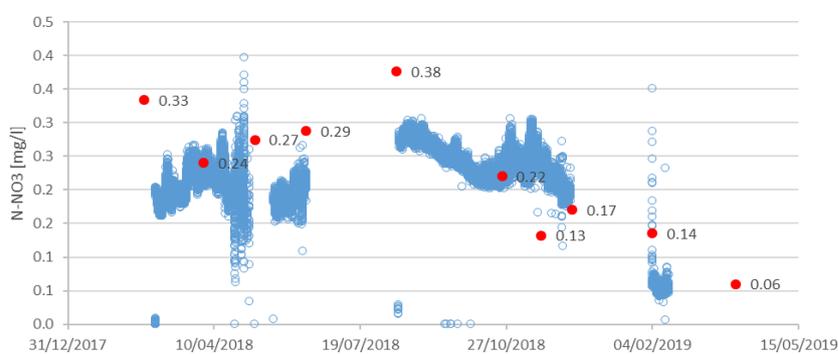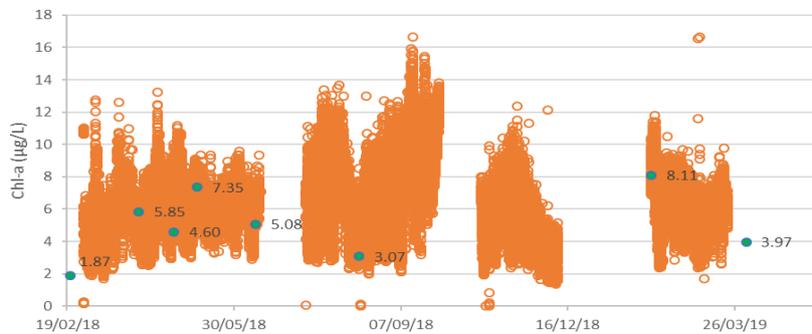

Innovation/Outlook

- ✓ Rapid and real-time detection of water quality parameters.
- ✓ Good strategy for reservoir operation, planning and management.