MuDak-WRM

FONA Research for Sustainable Development BMBF

Sponsored by the Federal Ministry of Education and Research

# Monitoring Passauna's reservoir water quality

**Water quality monitoring with field measurements, laboratory analysis, and initial investigations.**

## Context

Monitoring physical and chemical parameters are important to characterize the reservoir in terms of water quality and hydrodynamic behavior.

**Objectives/Goals**

- Evaluate Passaúna's reservoir water quality dynamics
- Identify the spatial and temporal variability of Passaúna's reservoir WQ through monthly measurements
- Perfom different analysis to assess the overall interactions between physical, chemical and biological parameters.

## Methods and Equipments

Chemical analyses included Nitrogen (Nitrate, Nitrite, Total Ammoniacal Nitrogen, Total Nitrogen), Phosphorus (Orthophosphate, Particulate Phosphorus, Total and Dissolved Phosphorus), Solids (Total Suspended and Dissolved Solids), Chlorophyll-a and Dissolved Organic Carbon (DOC). A summary of field caimpaings are shown in the following Table.

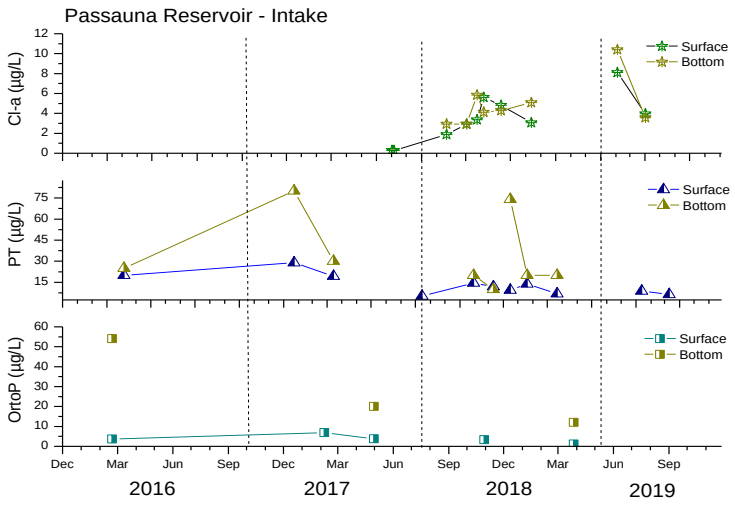
**Table 1: Summary of fiel campaings [2018-2019]**

| Campaigns | Inflow | Buffer | Ferraria Bridge | PPA | Park | Reservoir center | Intake | Dam | Outflow |
|---|---|---|---|---|---|---|---|---|---|
| 2018, February | o | o | o | o | o | o | o | o | o |
| 2018, April (03) | o | | | | | | o | | o |
| 2018, April (24) | | | | | | | o | | |
| 2018, May | o | | | | | | o | | o |
| 2018, June | o | | | | | | o | | o |
| 2018, July | | | | | | | | | |
| 2018, August | o | o | o | o | o | o | o | o | o |
| 2018, October | o | o | o | o | | | o | | o |
| 2018, November | o | o | o | o | | | o | | o |
| 2018, December | o | o | o | o | | | o | | o |
| 2019, January | | | | | | | | | |
| 2019, February | o | o | o | o | o | o | o | o | o |
| 2019, March | | | | | | | | | |
| 2019, April | o | | o | o | | | o | | o |

## Preliminary Results

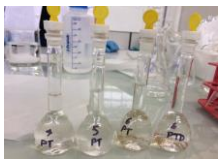
- Probable phosphorus retention/assimilation (lower concentrations at outflow while higher concentrations of nitrogen are observed)
- Higher concentrations of TP and TN at inflow and probable retention at buffer region
- Ocurrence of DO decay at bottom layers and concequently changes in gas flux and in phosphorous availability in bottom layers

Figure 1: Variation of chlorophyll-a, total phosphorous and orthophosphate at intake [2016-2019]




## Innovation/Outlook/Insights

- Low concentrations in overall parameters analyzed (different approaches for laboratory analysis)
- Differences at inflow→reservoir → outflow: probable assimilation/retention/decay
- Data base for sensors calibration/validation and water quality modeling



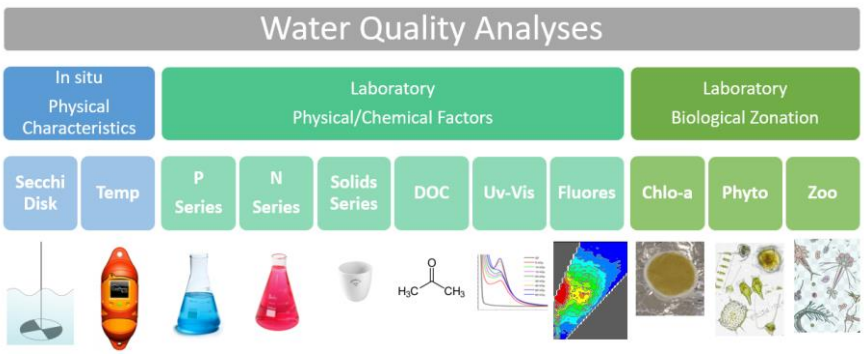


Figure 2: Variation of chlorophyll-a, total phosphorous and total nitrogen in different monitoring sites [2018-2019]

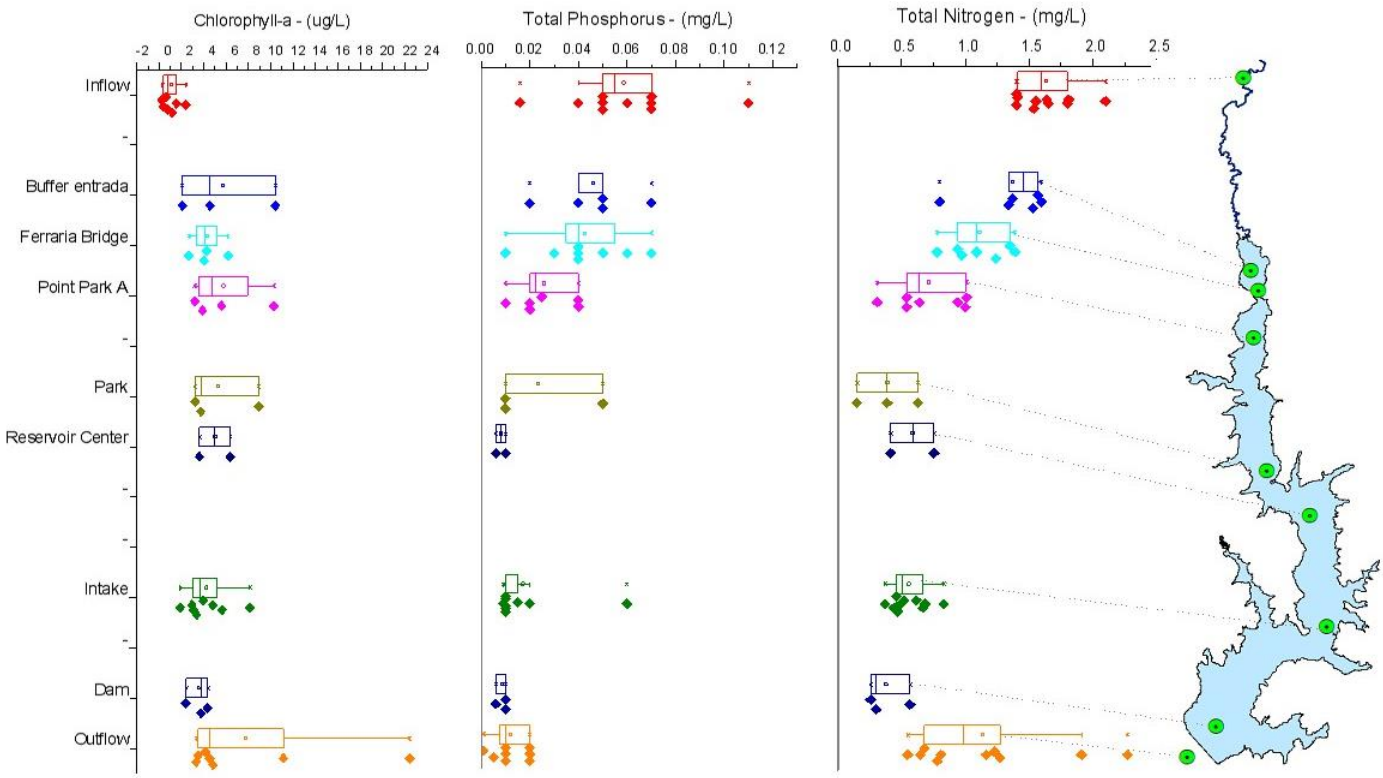
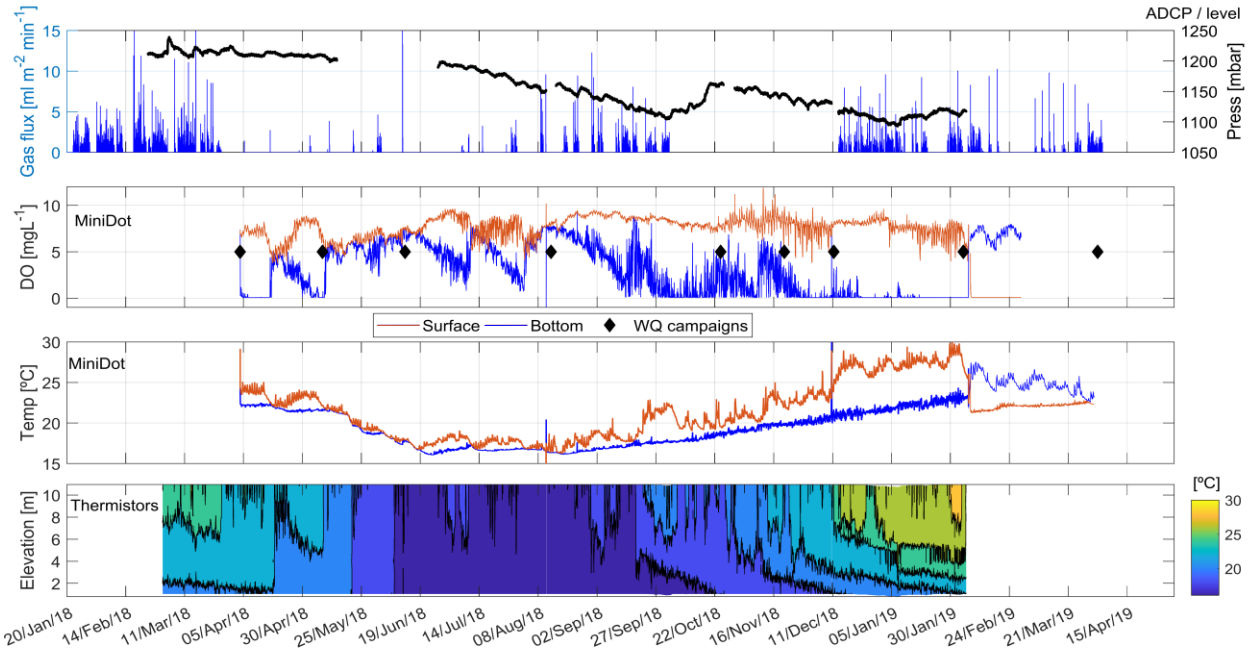



Figure 3: Variation of dissolved oxygen, temperature and gas flux at inlet monitoring site [2018-2019]





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