UNESCO-IWRA ONLINE CONFERENCE
17-19 JANUARY 2023
3RD IN THE IWRA ONLINE CONFERENCE SERIES

Emerging Pollutants: Protecting Water Quality for the Health of People and the Environment

Occurrence of Emerging Contaminants in the Pampulha Lake: anthropic pollution of a UNESCO Heritage Site

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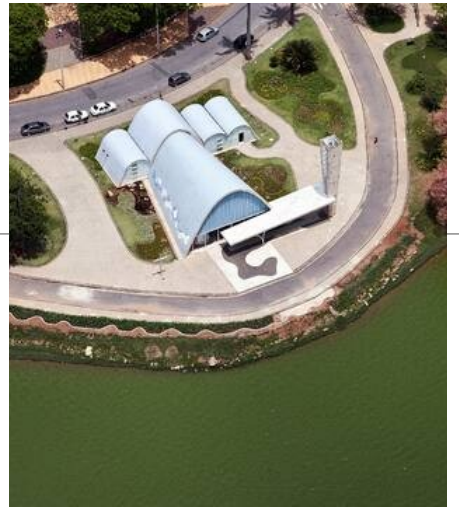
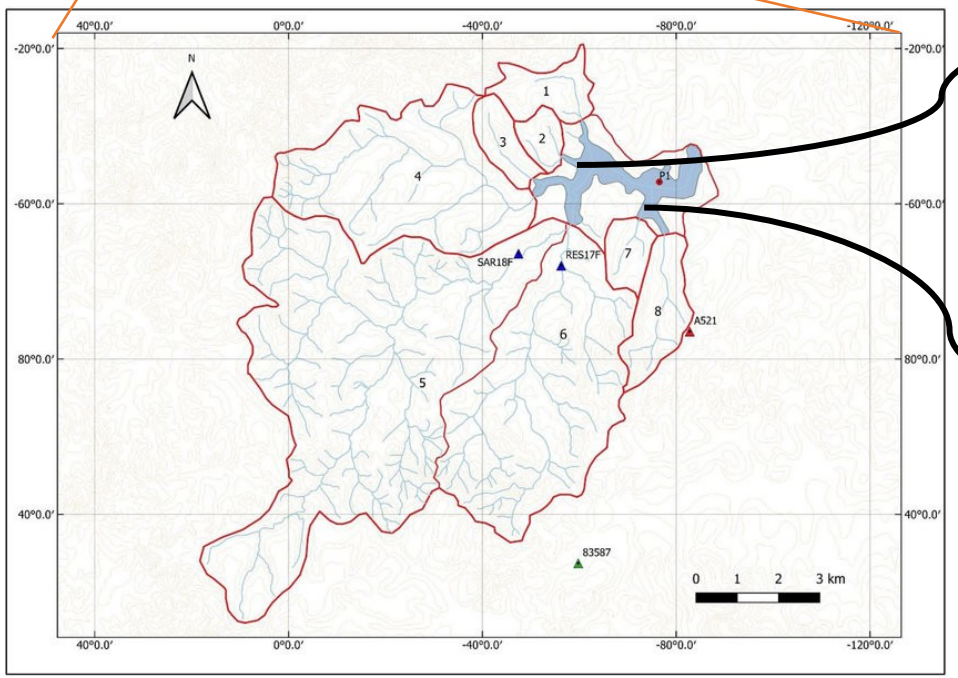
unesco
Programme hydrologique intergouvernemental

IWRA International Water Resources Association



The Pampulha Modern Ensemble (1940)

The Pampulha Lake



Plec et al. (2021). DOI: 10.1590/2318-0331.262120200150.

Emerging Contaminants

Pesticides

2,4-D	Fipronil*
Ametryn	Hexazinone
Atrazine*	Imidacloprid
Azoxystrobin	Malathion
Carbendazim	Simazine
Carbofuran	Tebuconazole
Diuron*	Tebuthiuron

Pharmaceutical/PCP

Acetaminophen	Ibuprofen
Caffeine	Triclosan
Diclofenac	

Hormones

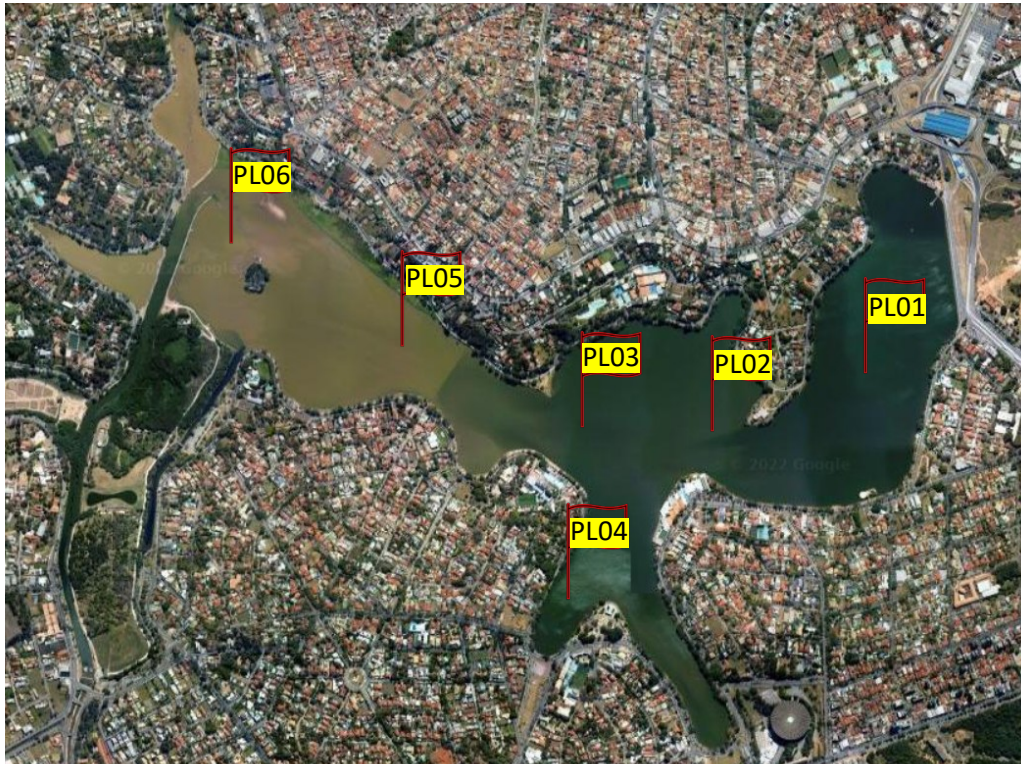
Estrogen*	Testosterone

* Includes metabolites or related compounds

Total analytes: 30

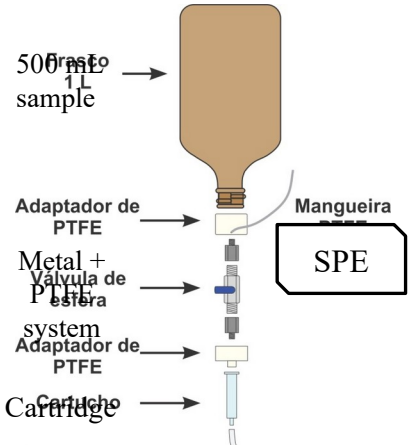
Method: Sampling and sample preparation

- Sampling Points



Sampling campaigns in June/2022 and August/2022.

- Sample Preparation and Analysis



LC-MS/MS Agilent 1200-6410B

Preliminary Results

- 7 compounds were not found in any of the samples: acetaminophen (LOQ = 25 ng L^{-1}), caffeine (LOQ = 25 ng L^{-1}), diclofenac (LOQ = 10 ng L^{-1}), estrogen (LOQ = 5 ng L^{-1}), ibuprofen (LOQ = 10 ng L^{-1}), malathion (LOQ = 1 ng L^{-1}), testosterone (LOQ = 2.5 ng L^{-1}).

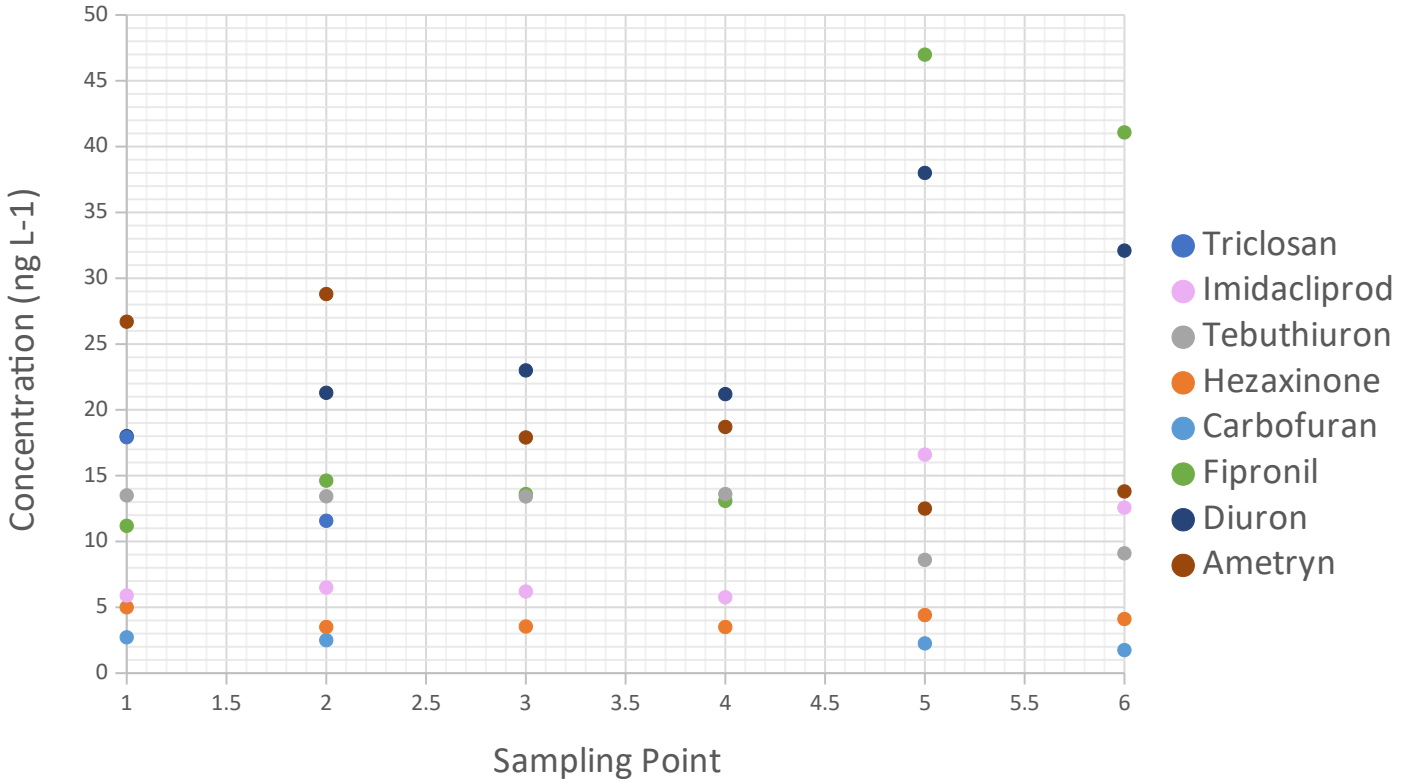
- Most of the compounds presented higher concentrations in Aug/2022 (possible seasonal effect).

- Atrazine (450 ± 60 ng L^{-1}), carbendazim (230 ± 15 ng L^{-1}), and hexazinone (4.0 ± 0.6 ng L^{-1}) evenly distributed throughout the lake.

- Atrazine, simazine, carbendazin and 2,4-D presented the higher concentrations (100 – 450 ng L^{-1}).

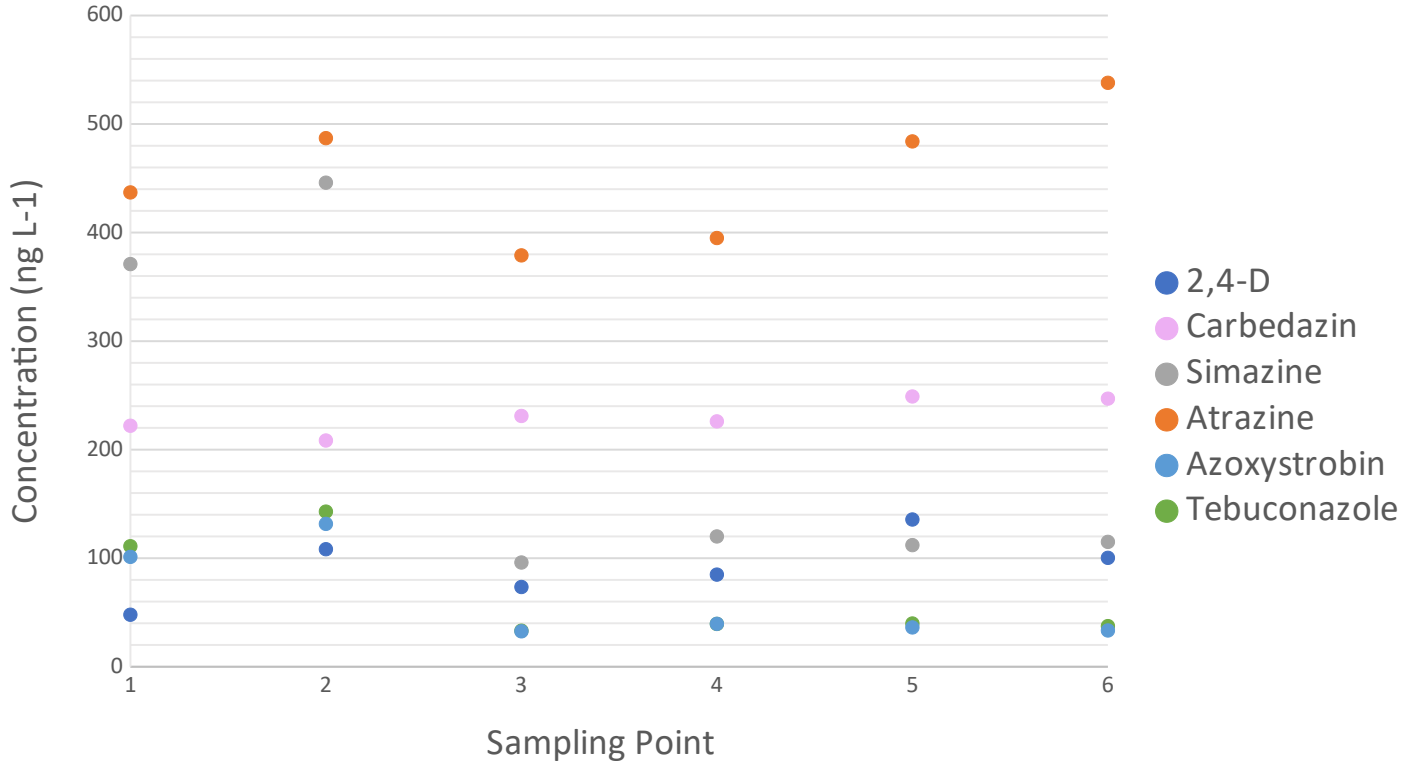
Preliminary Results

Concentration range: 0 – 50 ng L^{-1}



Preliminary Results

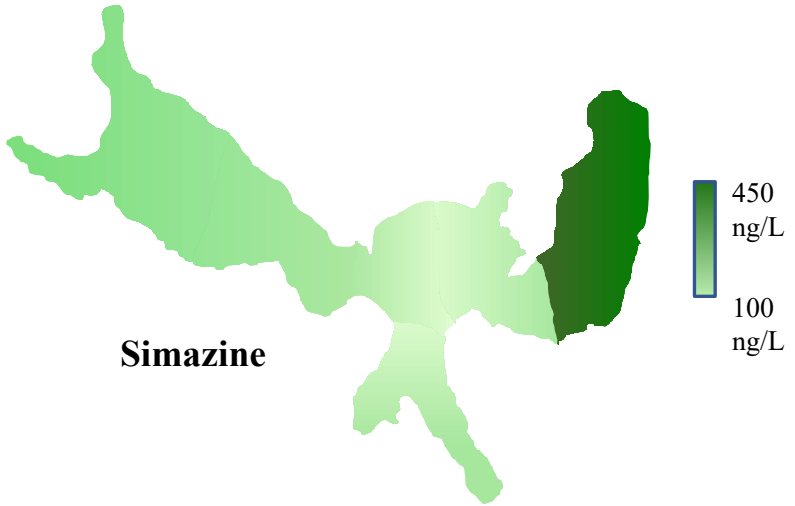
Concentration range: 50 – 600 ng L^{-1}



Preliminary Results

Dilution patterns

Higher influence from tributaries



Closest to the gardens and buildings around the lake

Next steps

- Schedualed sampling campaigns for 2023.
- Assess the seasonal effect in the levels of the contaminants.
- Confirm the distribution patterns observed so far, aiming to discuss the possible sources for the contaminants in the Pampulha Lake.

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Thank you for watching!

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UFMG

CNPq

INCTAA Instituto Nacional de Ciências e Tecnologias Analíticas Avançadas

Environmental Chemistry Lab. team