WATER QUALITY EVOLUTION AND CLASSIFICATION IN THE SÃO MARCOS RIVER/RS

BIT INOVAÇÃO

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e XIV Mostra Acadêmica de Inovação e Tecnologia

Introduction

Water quality

Resolutions: CRH-RS No. 405/22 CONAMA No. 357/05

Establishes the classification and management of water quality

The São Marcos River should meet the limits established for Class 3 by 2022 and for Class 2 by 2032.

Objective: To verify the classification compliance of a section of the São Marcos River, based on data collected between the period of 2016 to 2023.

Materials and Methods

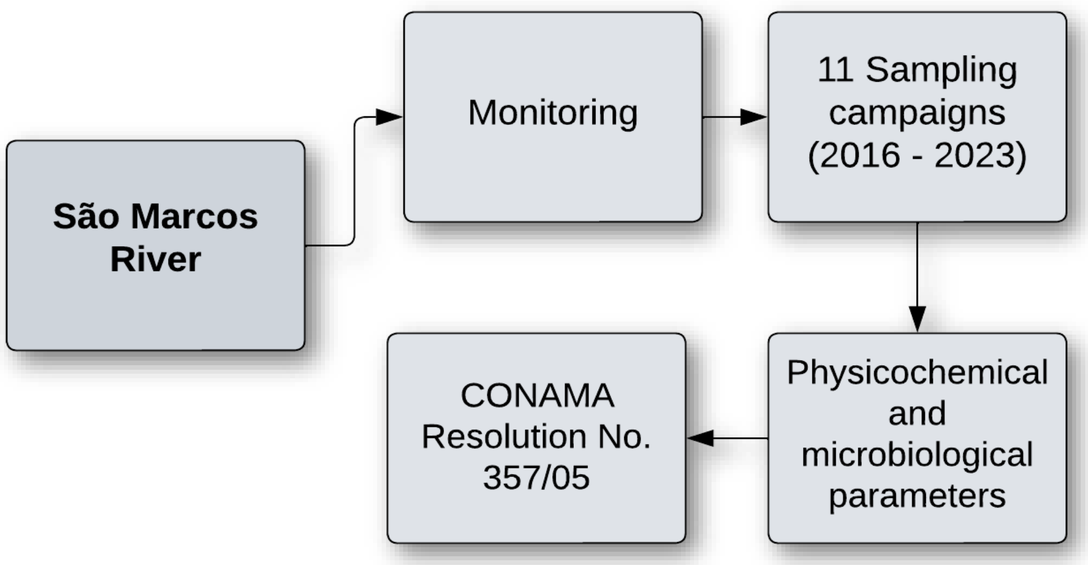


Figure 1: São Marcos River watershed and the location of the collection point

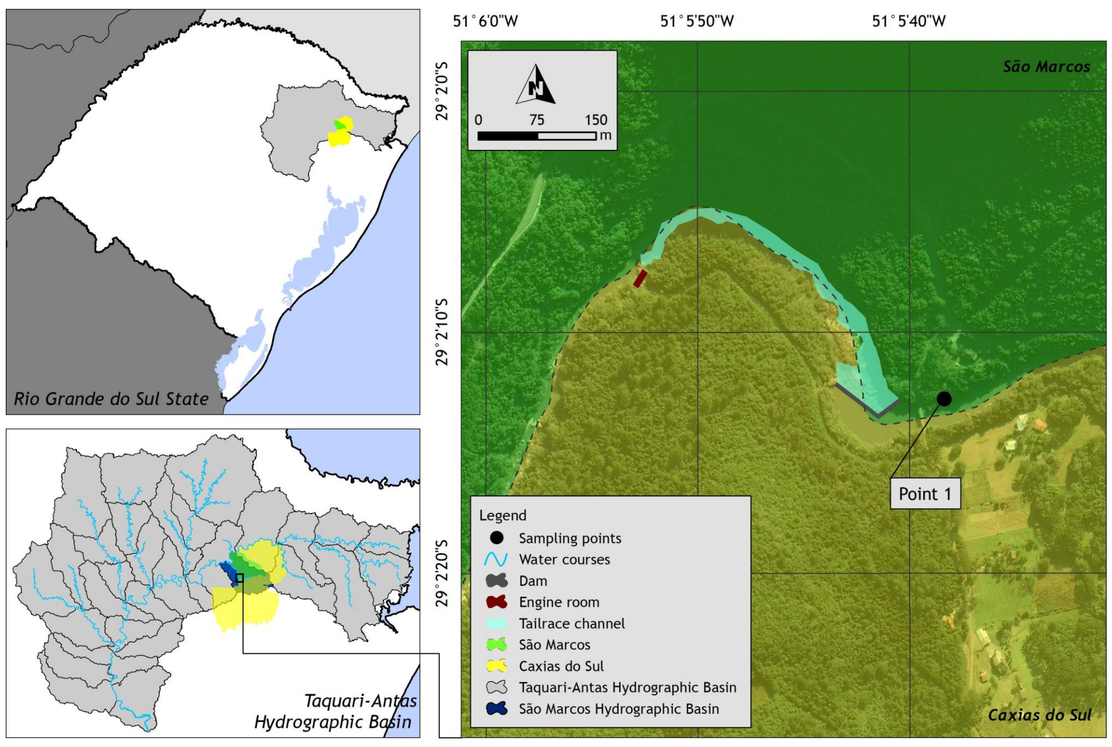


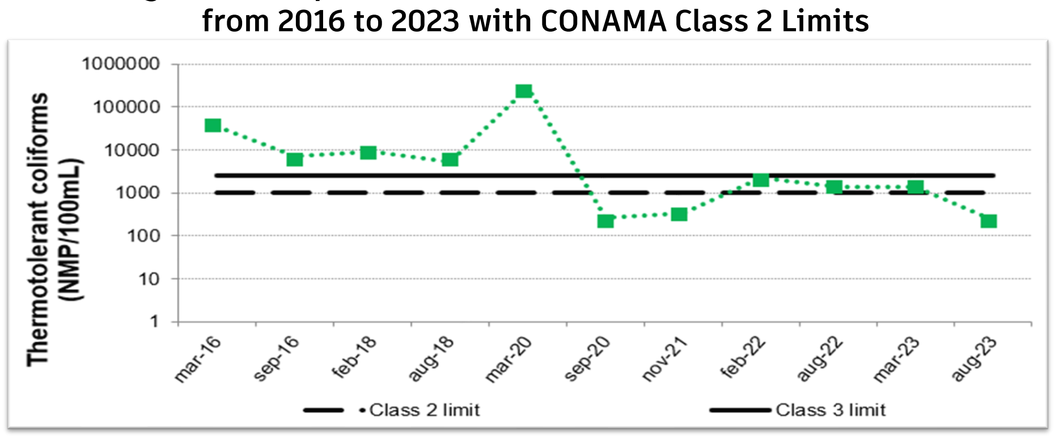
Figure 2: CONAMA Resolution No. 357/2005 Class 2 Limits

PARAMETER	CONAMA 357/05 - Class 2
Chlorophyll-a (µg/m³)	≤ 30
Thermotolerant Coliforms (MPN/100 mL)	≤ 1000
Biochemical Oxygen Demand (BOD). (mg O2/L)	≤ 5
pH	6.0 to 9.0
Total Phosphorus (mg P/L)	≤ 0.03 in lentic environments; ≤ 0.05 in intermediate environments; ≤ 0.10 in lotic environments
Nitrate (mg/L)	≤ 10
Dissolved Oxygen (DO)(mg O2/L)	≥ 5
Turbidity (NTU)	≤ 100

Results and Discussion

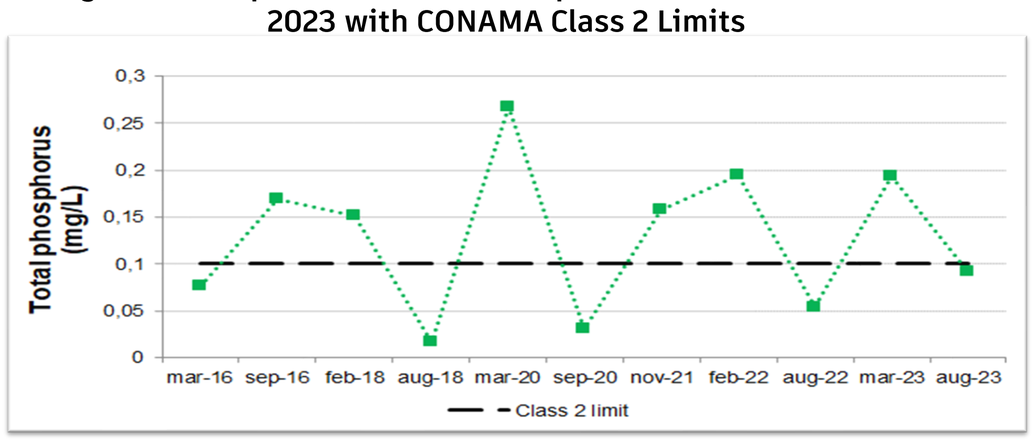
The results obtained for pH, BOD, DO, Nitrate, Chlorophyll-a and Turbidity met the limits for Class 2 throughout the analyzed period. Thermotolerant coliforms remained above the limits established for Class 3 in the sampling campaigns from 2016 to 2020, however there is a trend of proximity to meet the requirements for Class 2 in the last sampling campaign carried out (Aug/22 to Aug/23) (Figure 3).

Figure 3: Comparison of Thermotolerant Coliforms Results from 2016 to 2023 with CONAMA Class 2 Limits



Regarding phosphorus, the concentrations presented significant variations in the analyzed period, remaining above the limits established for Class 3 in 55% of the sampling campaigns conducted, however in the last sampling campaign (Aug/23) the result was below the limit defined for Class 2 (Figure 4).

Figure 4: Comparison of Total Phosphorus Results from 2016 to 2023 with CONAMA Class 2 Limits

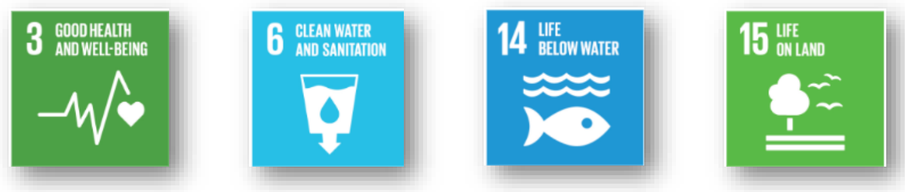


Final Consideration

Comparing the classifications of the sampling campaigns carried out in the years 2016 to 2023, there is a trend of improvement in water quality, and in the last sampling campaign (Aug/23) all parameters analyzed were in compliance with the classification.

References and SDGs relevant to the research

- BRASIL. **Resolução CONAMA nº 357/05**. Dispõe sobre a classificação dos corpos de água e diretrizes ambientais para o seu enquadramento, bem como estabelece as condições e padrões de lançamento de efluentes, e dá outras providências. Diário Oficial da República Federativa do Brasil, Brasília, 18 mar. 2005.
- RIO GRANDE DO SUL. **Resolução CRH nº405/22**. Atualiza o enquadramento das águas superficiais da Bacia Hidrográfica do Rio Taquari-Antas. Diário Oficial do Estado do Rio Grande do Sul, Porto Alegre, 22 mar. 2022.



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