

Perspectives of Application of SWOT data in South America

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INTRODUCTION

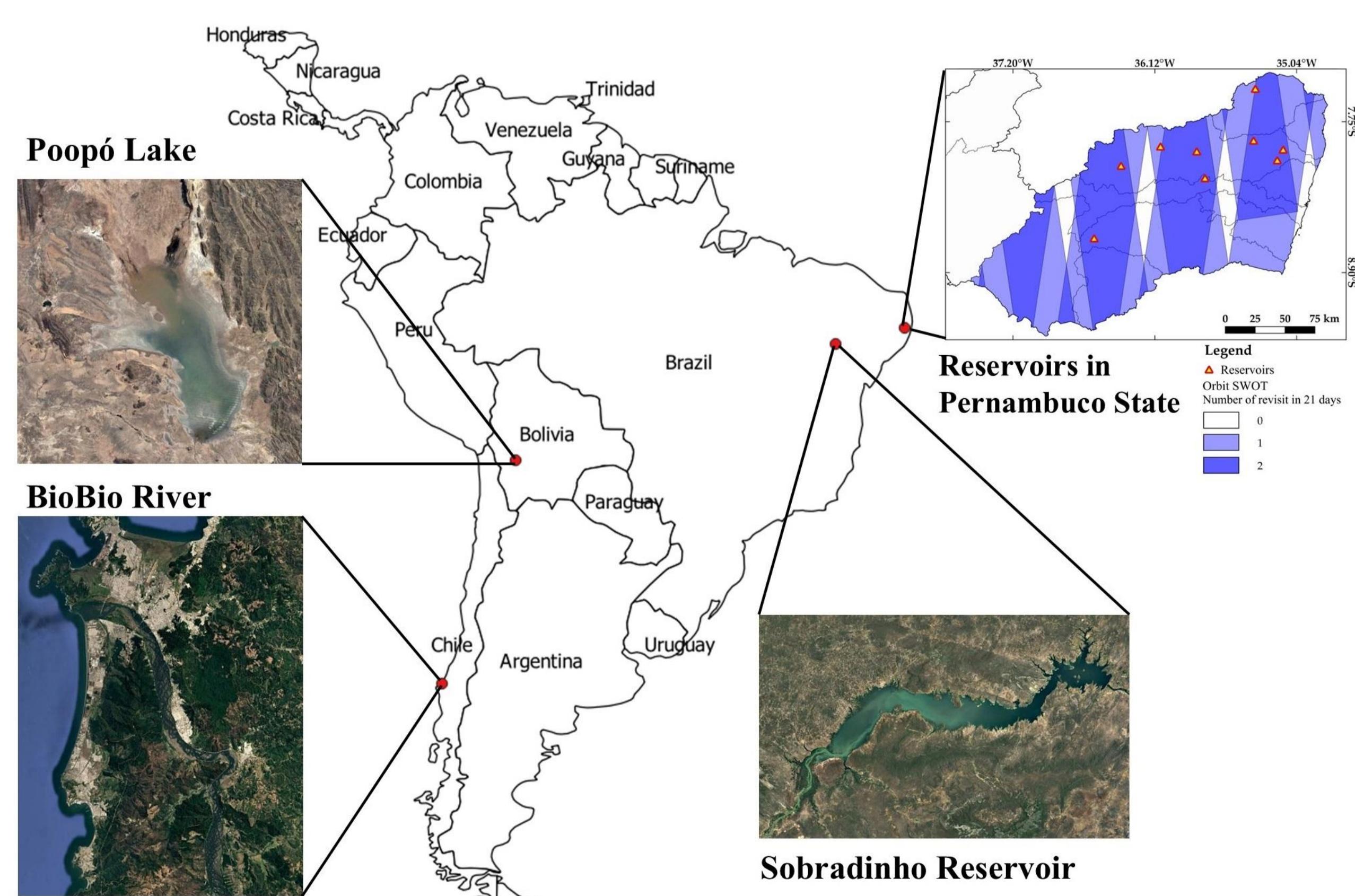
The global climate system is undergoing profound changes, primarily driven by increasing concentrations of greenhouse gases. One of the most impacted components is the freshwater system, as disruptions in the global water cycle are intensifying. These are particularly visible in the increasing frequency and severity of hydrological extremes (droughts and floods) with major social, environmental, and economic consequences. South America is experiencing these changes firsthand.

OBJECTIVES

The partnership aims to strengthen regional early warning systems and promote sustainable water management through scientific collaboration and capacity building.

STUDY AREA AND CONTEXT

In Brazil, unprecedented floods in the state of Rio Grande do Sul (2024–2025) displaced hundreds of thousands. In Bolivia, concurrent droughts and floods have impacted water security, while glacier retreat in the Andes threatens long-term water availability. In Chile, recurrent droughts and changing snowmelt patterns have disrupted water resources and increased flash flood risks in mountainous areas.

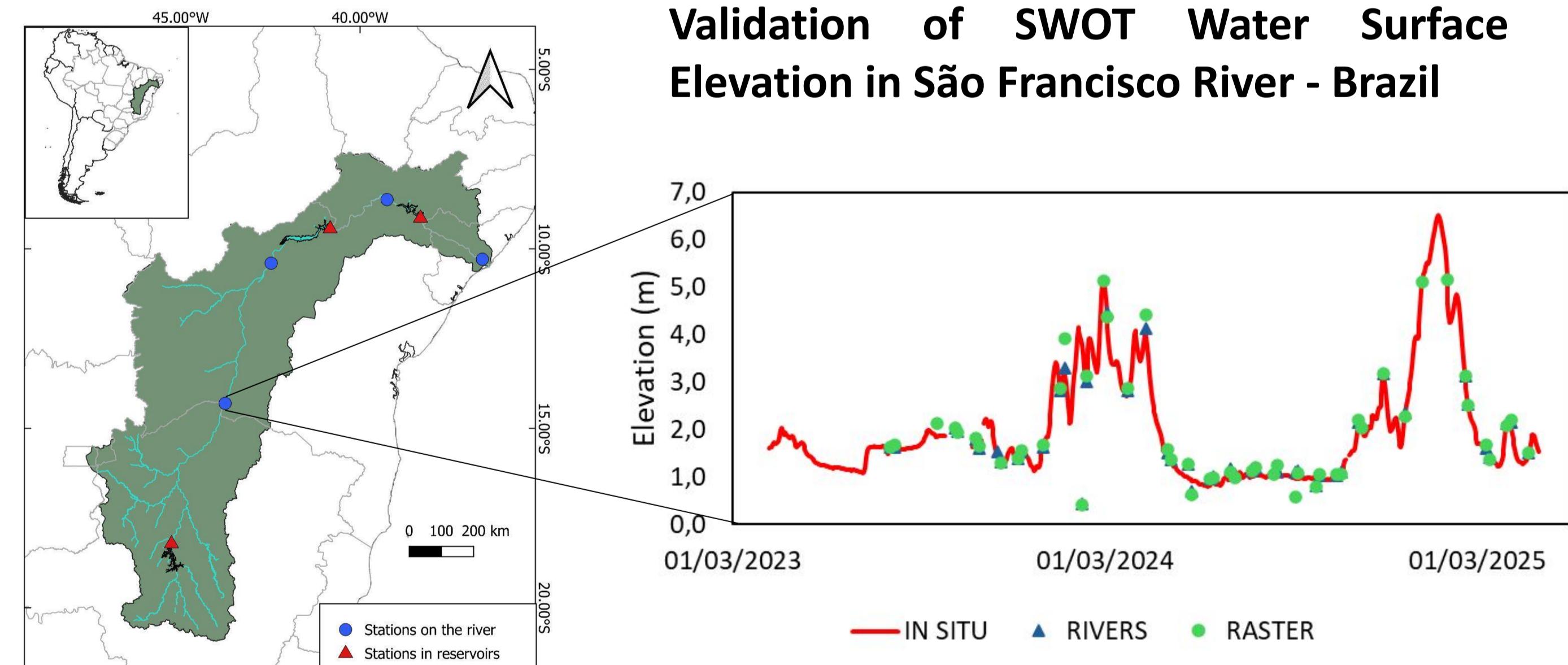
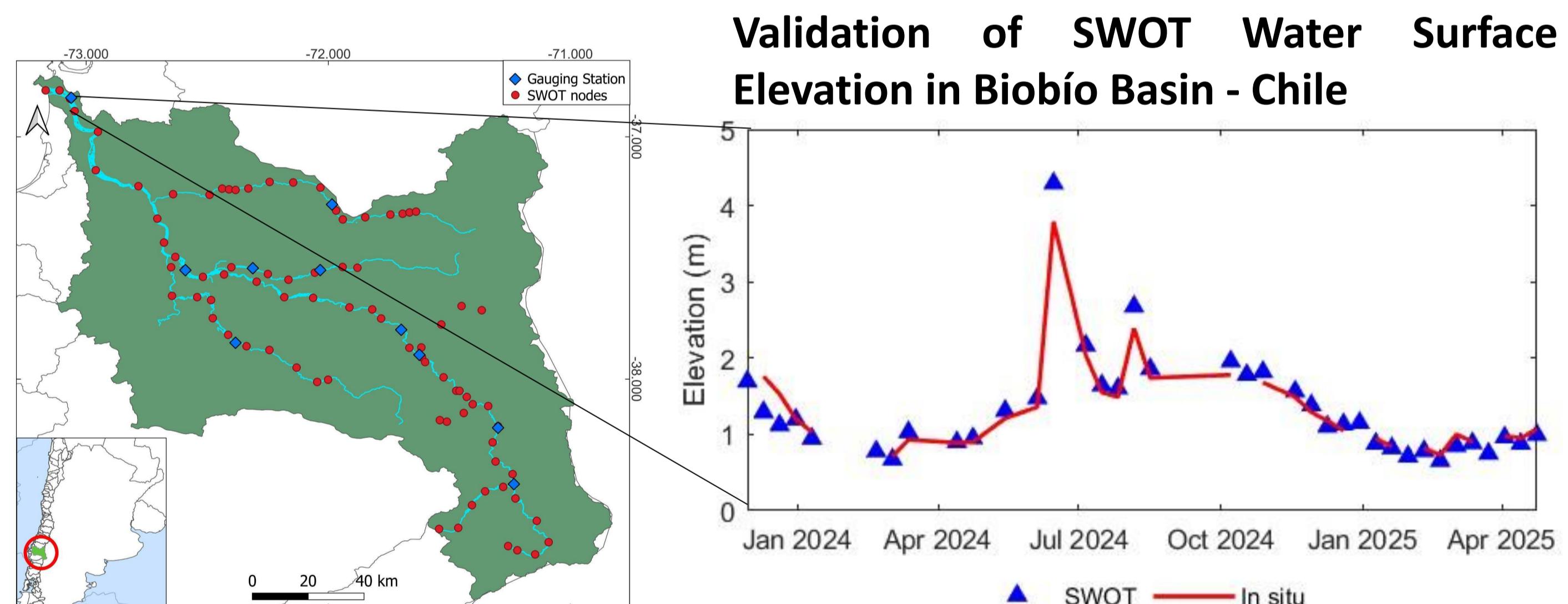


DATASET

Traditional monitoring systems are limited in remote, data-scarce regions, where high spatial and temporal resolution are crucial. Satellite remote sensing, particularly SWOT, offers effective alternatives to fill these gaps and provide actionable information. This tool supports more accurate risk assessments for floods and droughts, as well as better water resource planning and climate adaptation strategies.

RESULTS

The first applications of SWOT data in the central Chile and Northeast of Brazil have shown promising results, demonstrating the potential of the mission to provide subsidies for water resources management.



FINAL REMARKS

The diverse climatic pressures highlight the need for robust monitoring and forecasting tools across contrasting hydrological environments in South America. The collaborative research initiative will address these challenges by leveraging the capabilities of remote sensing products, in particular the validation of SWOT data across diverse sites in South America.

