

June 2025 - Jeju, South Korea

An International SWAT Conference & Workshops will be held 23-27 June, 2025 at Cheju Halla University, a private university located in Jeju Province, Republic of Korea.

Expansion of the Hydrological Response Units System for Pernambuco (SUPer)

Josicleda D. Galvinctio (UFPE), Suzana G. Montenegro (UFPE/APAC), Magna Soelma Besrra de Moura (EMBRAPA),
Weronica M. Souza (UFAPE)

Background

SUPer is a SWAT-based hydrological modeling system developed with Texas A&M.

Covers 13 major basins in Pernambuco; project aims to expand to 15 small basins.

Small basins are key for urban planning, flood mitigation, and semi-arid irrigation.

Objectives

- Integrate 15 small river basins (6 coastal, 9 inland) into SUPer.
- Improve water availability and flood risk assessments.
- Support climate resilience and adaptive water planning.

Methodology

- Calibration and validation of SWAT models using data from 1961 to 2023.
- Hydrological components analyzed: precipitation, runoff, evapotranspiration, and groundwater recharge.
- Special focus on urban flood risk and semi-arid irrigation needs.

Selected Basin Results



- Metropolitan South: Urbanization and extreme rainfall increase flood risks.



- Planning Unit 24: Influenced by São Francisco River Transposition, facing water allocation challenges.



- High evaporation affects water storage; climate change may worsen variability.

Current Integration Status

- 9 basins integrated

- 4 in progress

- 1 remaining

Integration supports urban and rural water management improvements.



Metropolitana Sul basins-Pernambuco state

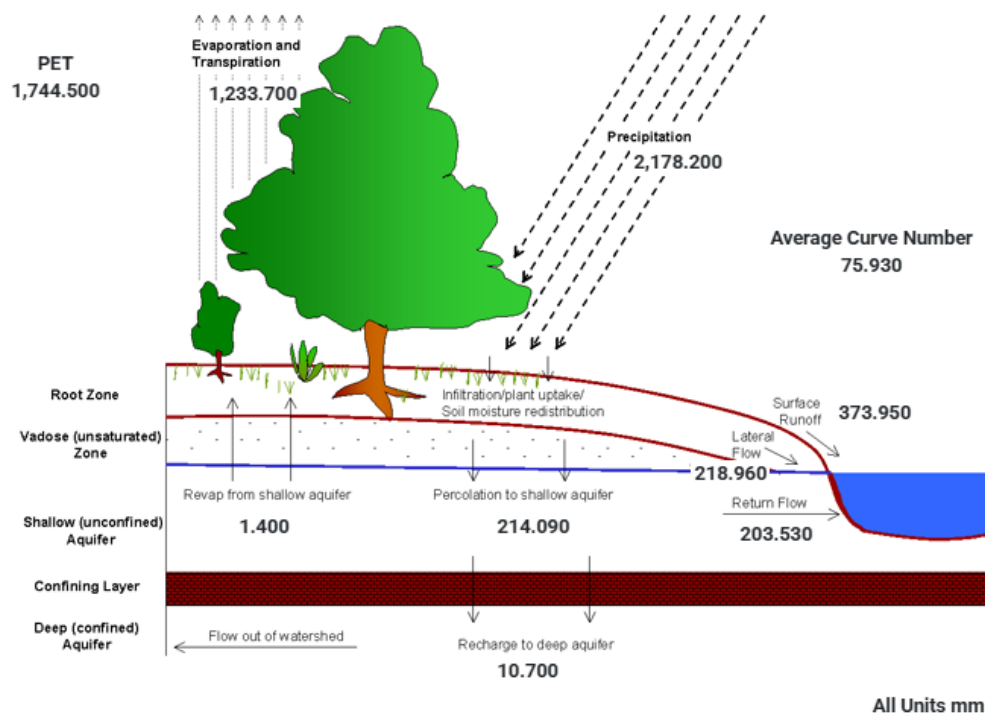
Spatial localization



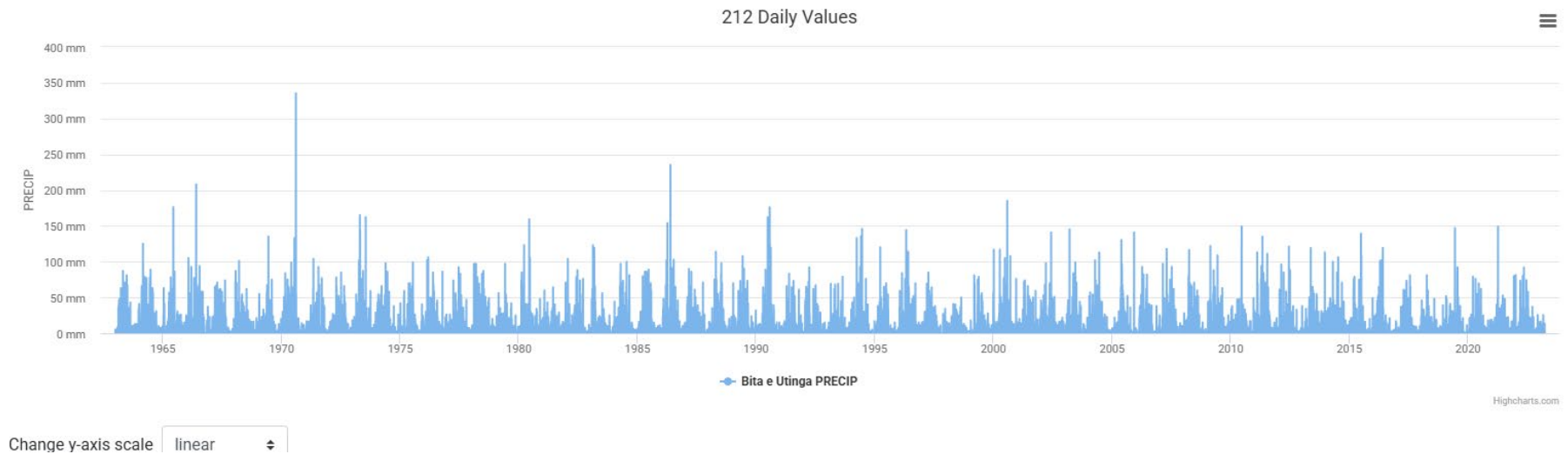
Date

Overview	Customize SWAT Inputs	Output Data
Weather dataset	Default	SWAT editor tables
Starting simulation date	1/4/1961	Access database
Ending simulation date	3/31/2023	
Set-up/warm-up years	2	
SWAT output print setting	Daily	

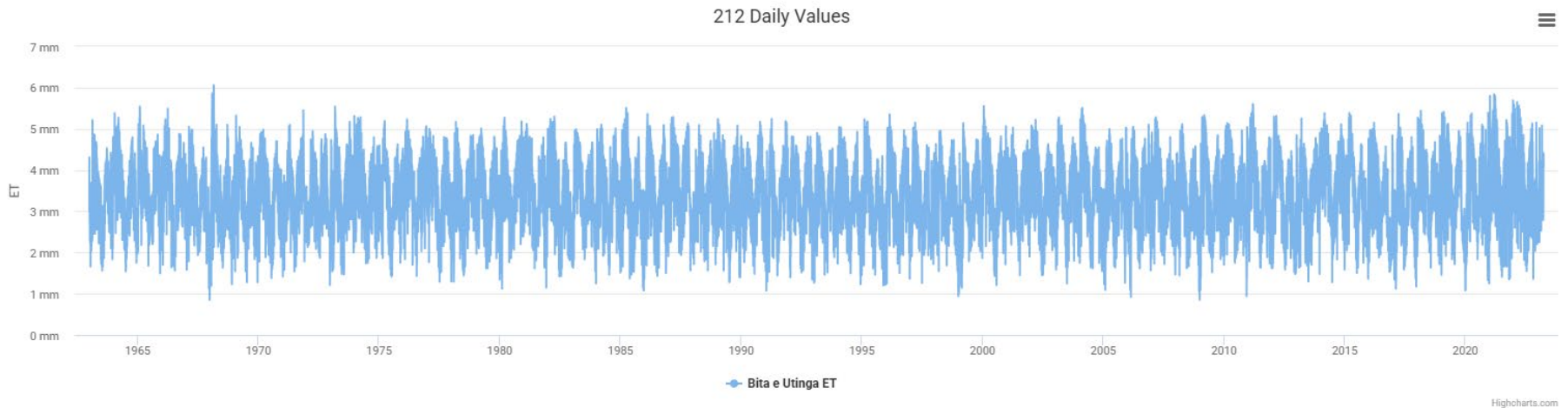
Annual water balance



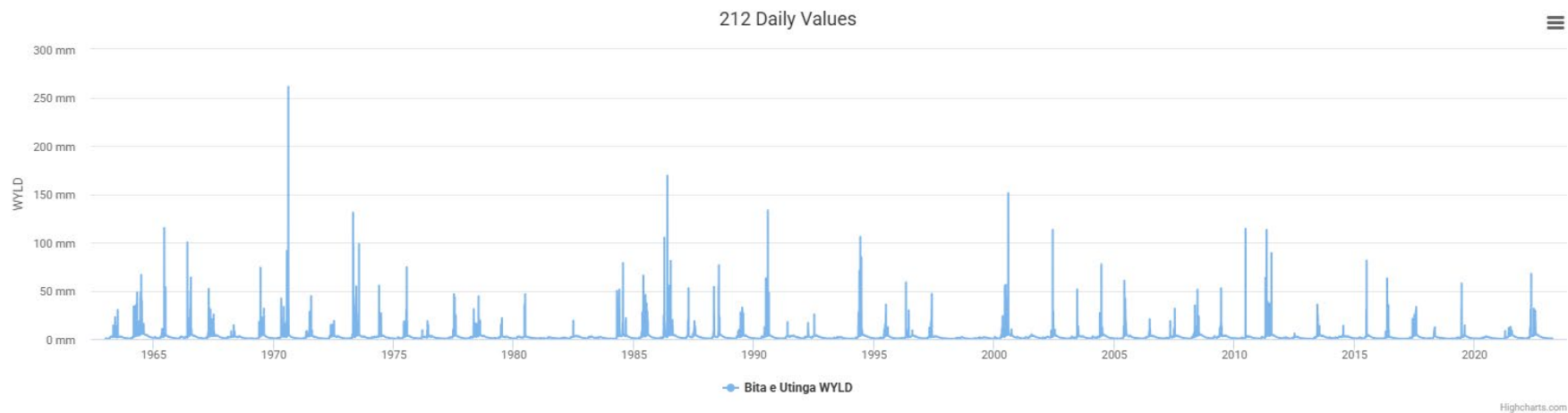
Precipitation



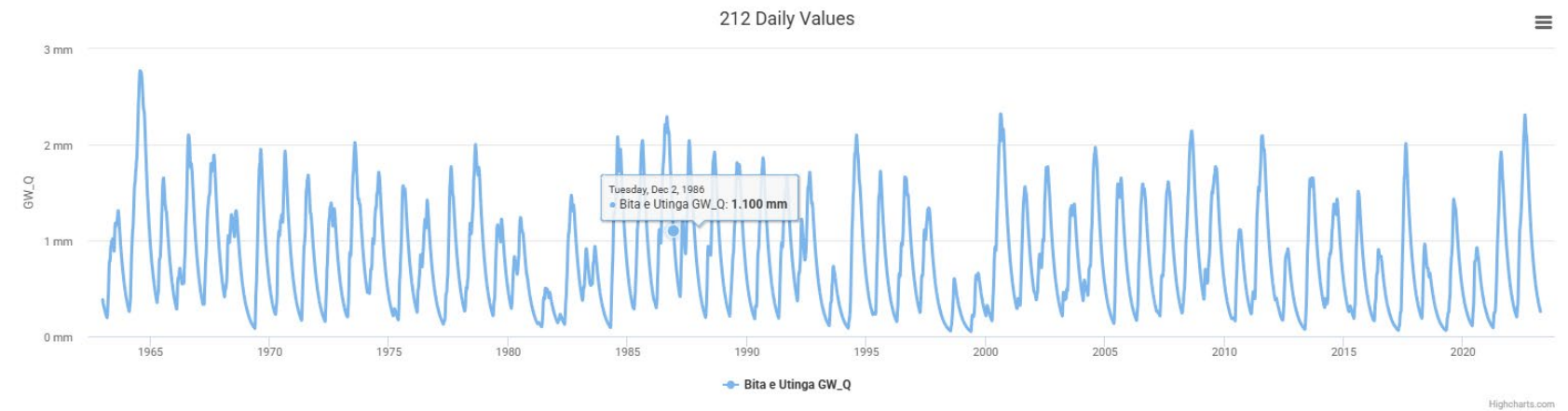
Real evapotranspiration



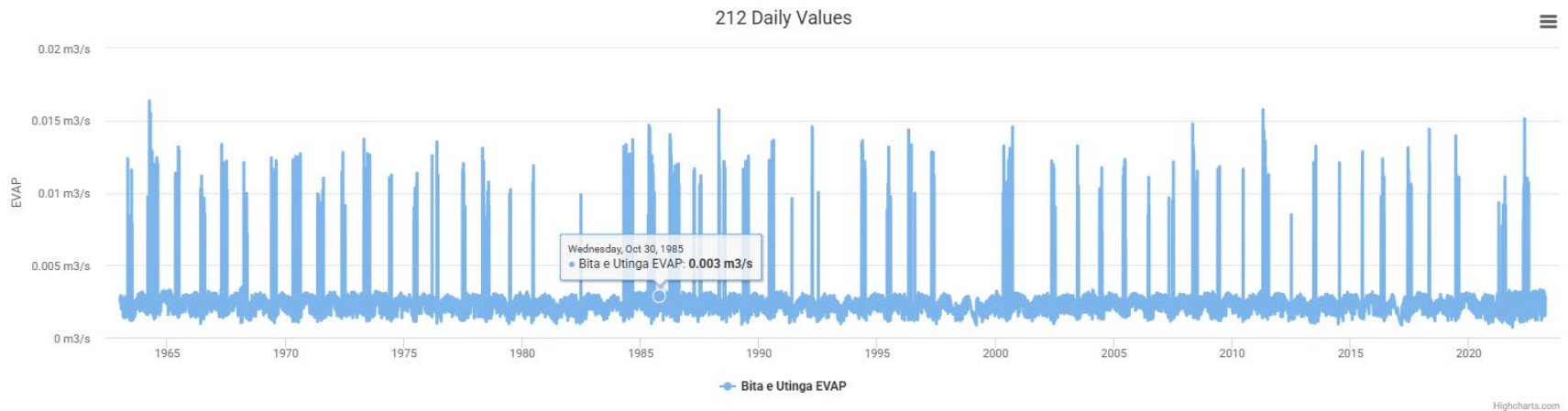
WYLD



GW_Q

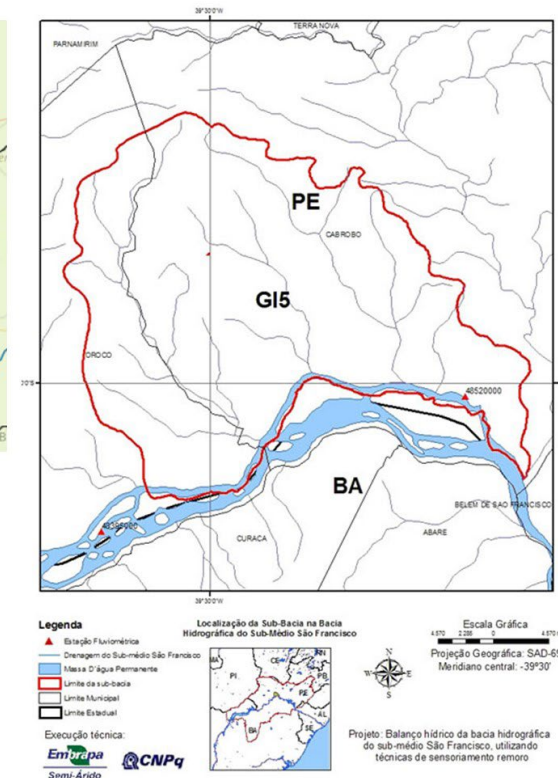
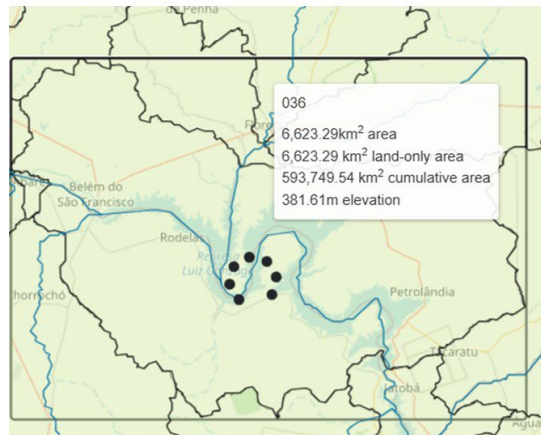


Evaporation

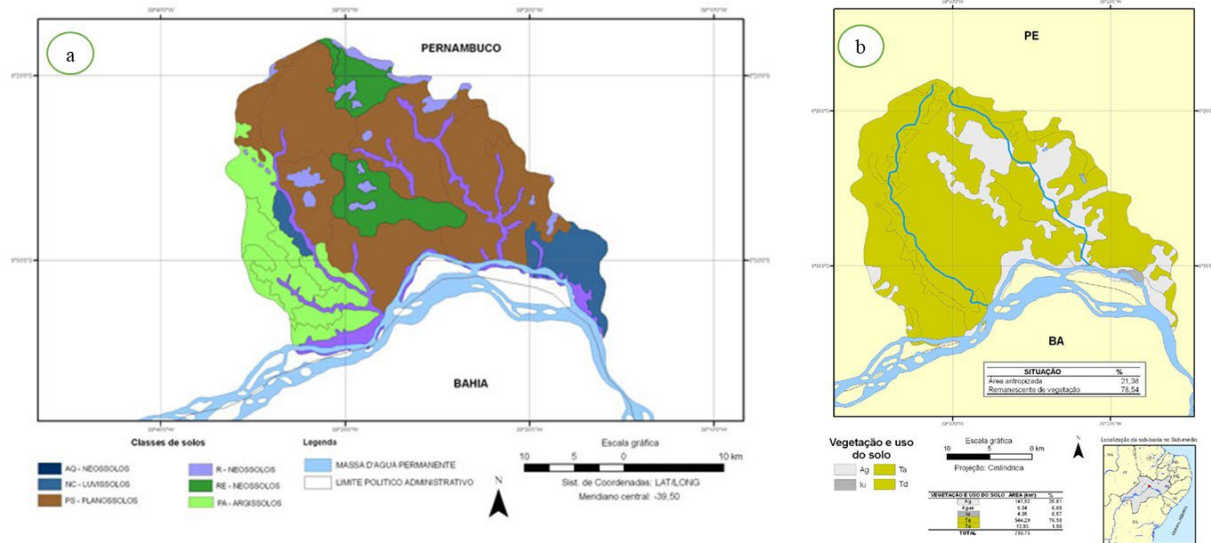


Inland Pernambuco Watershed Group

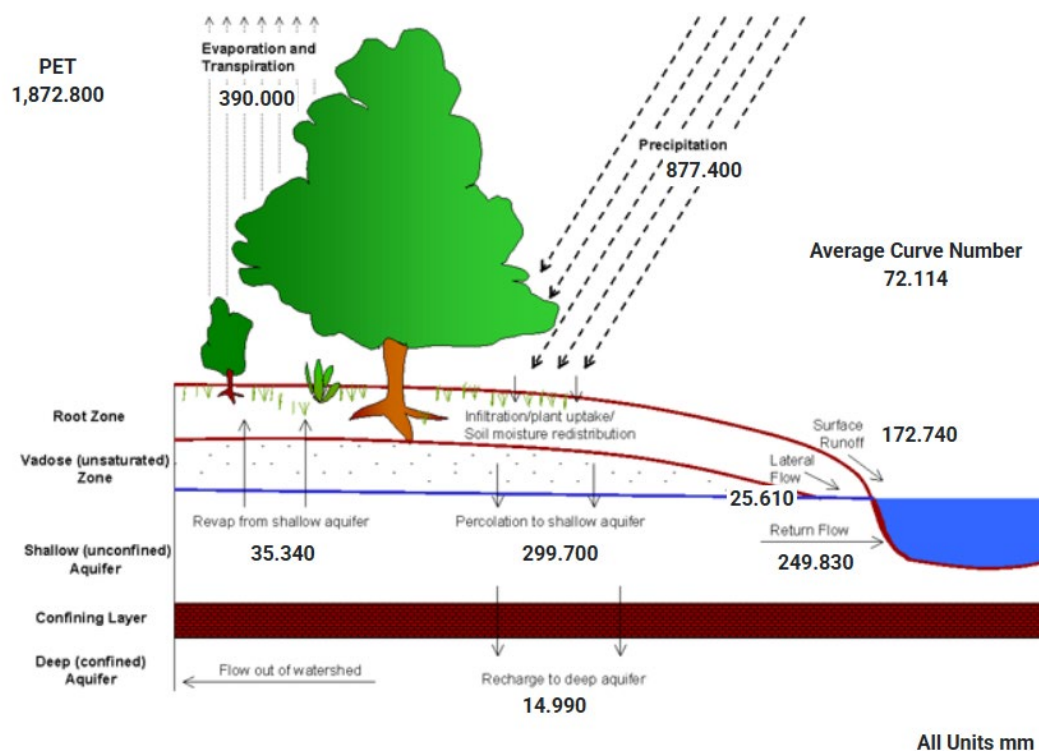
Number 3



Soil and landuse

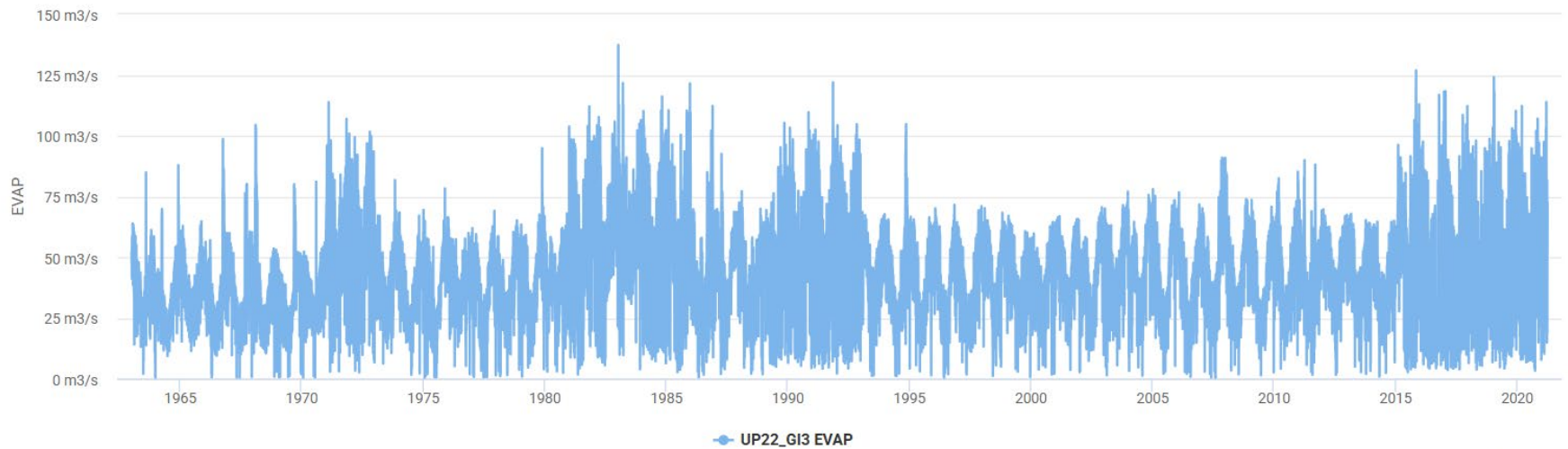


Annual Water balance



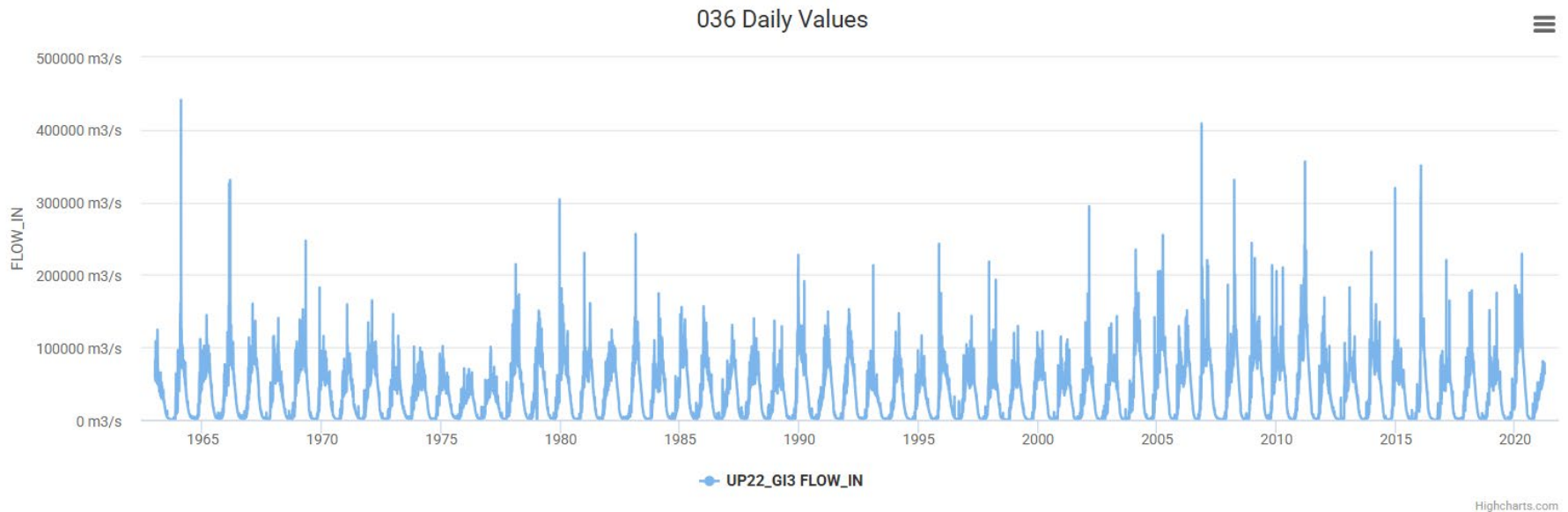
Evaporation

036 Daily Values

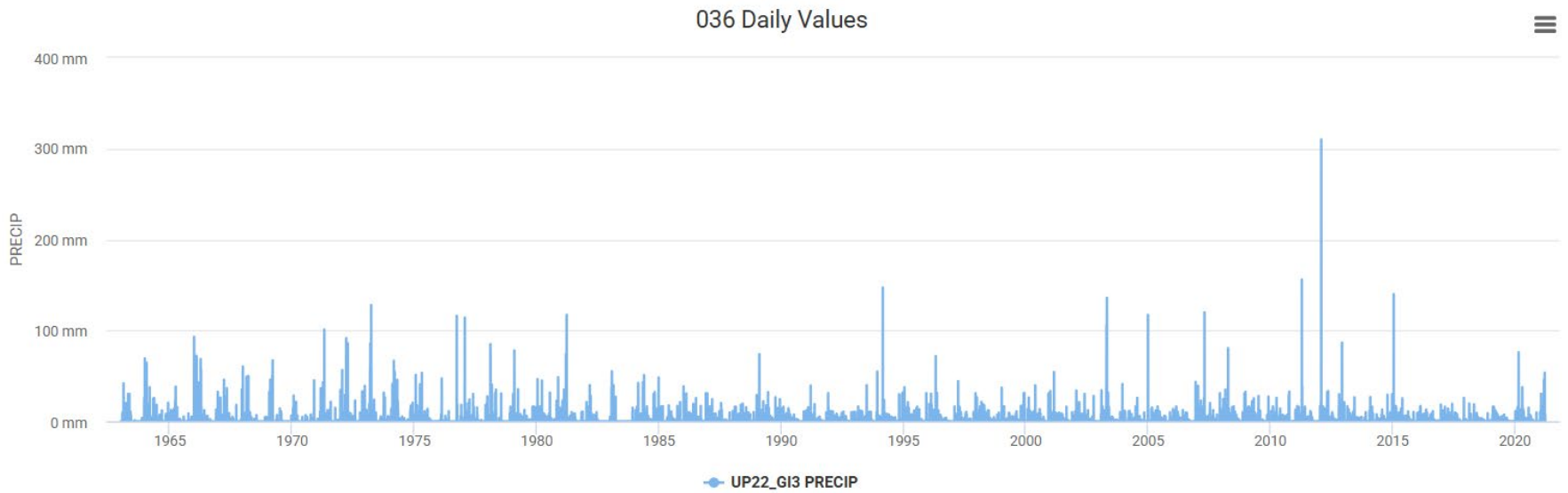


Highcharts.com

Flow_In

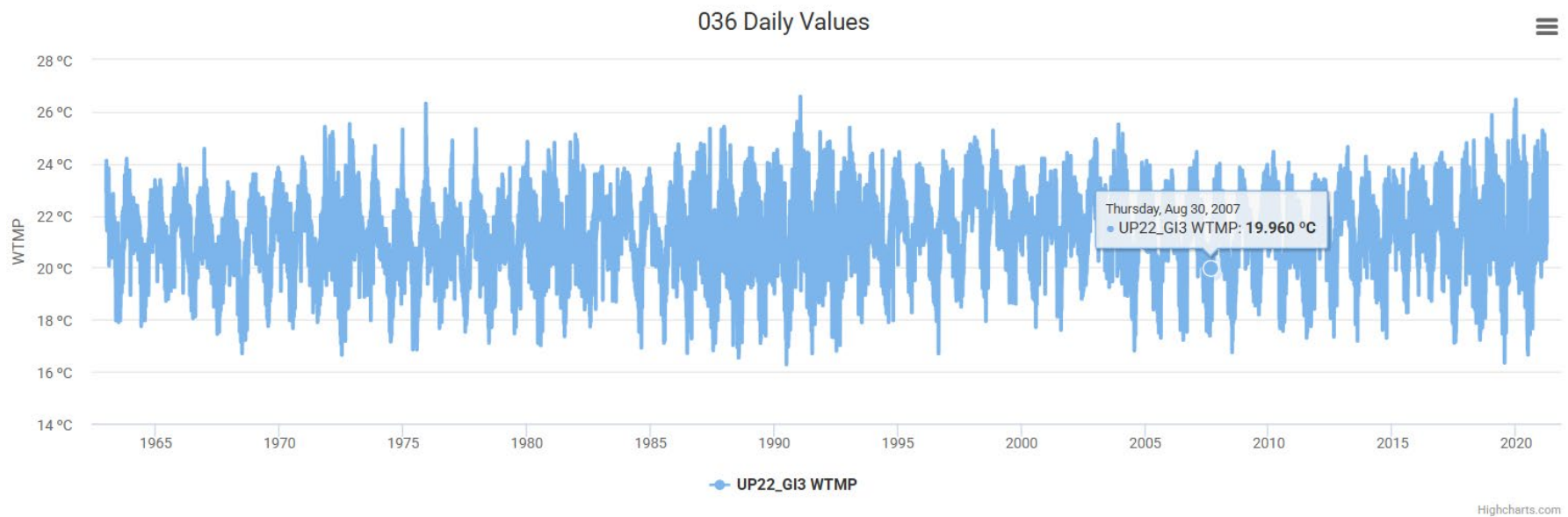


Precipitation



Highcharts.com

Water Surface temperature



Conclusion



- SUPer expansion strengthens hydrological modeling for Pernambuco.

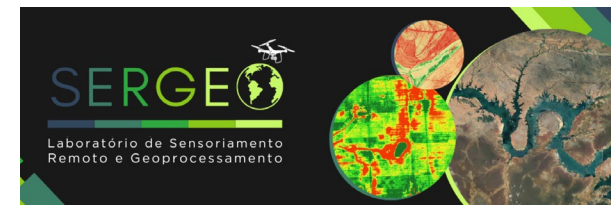
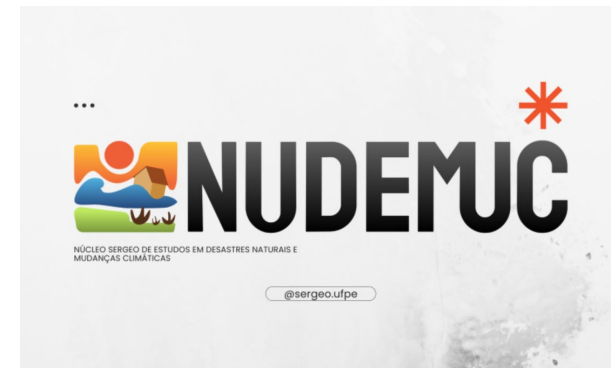


- Enables better flood control, water allocation, and climate adaptation.

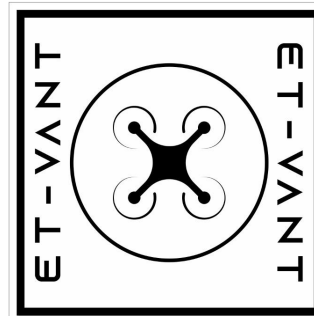
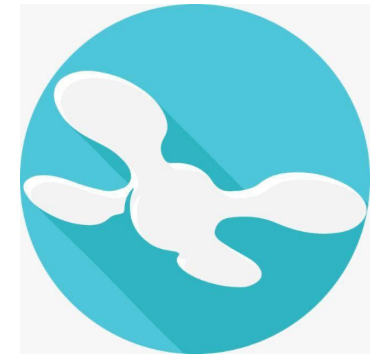
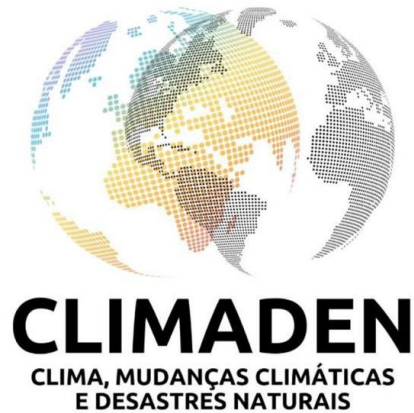


- A critical tool for evidence-based, integrated water governance.

Acknowledgments

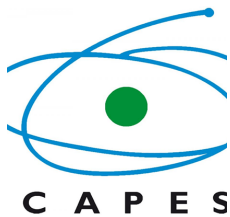


Acknowledgments



Spatial Sciences Laboratory

DEPARTMENT OF ECOLOGY AND CONSERVATION BIOLOGY



Acknowledgments

