ASSESSMENT OF WATER RESOURCES FROM AN INTERDISCIPLINARY APPROACH IN THE CHYULU HILLS

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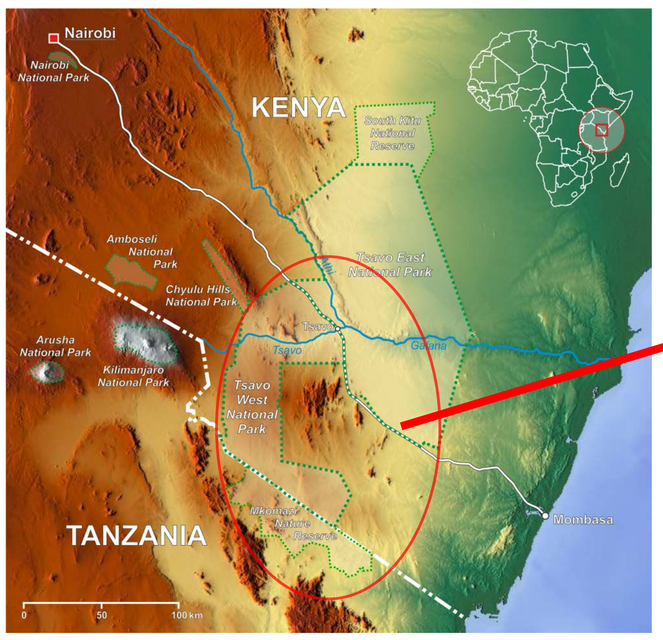
In France: Besançon University, Lyon University, Sorbonne University
In Kenya: Nairobi University, Technical University of Kenya, Regional Center of GroundWater



Context

The Chyulu Hills and Mzima Springs:

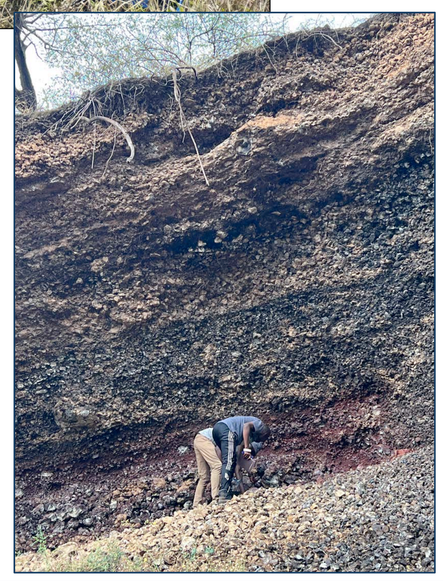
- a volcanic region that acts as a water tower for the neighboring area, extending up to the city of Mombasa
- impact of climate change
- economic, social, and agricultural issues

WATCH project (2023-2026, CNRS)

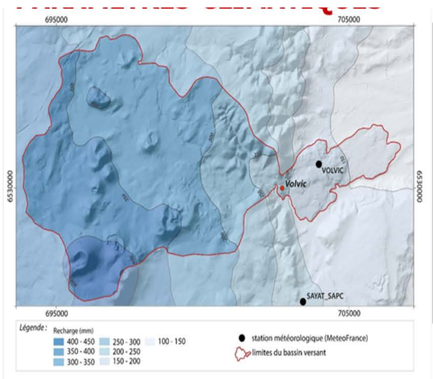
Scientific goals:

- understanding the hydrological system of the Chyulu Hills
- developing strategies for future management of water resources.

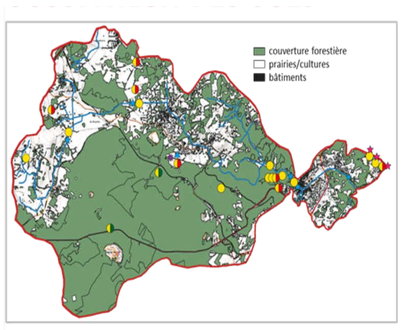
- A highly interdisciplinary project between geosciences, hydrogeosciences, physics, geography and social sciences.
- A bilateral project between French and Kenyan partners.



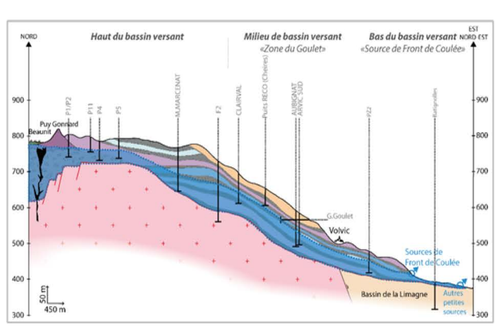
CLIMATE and RAINFALL



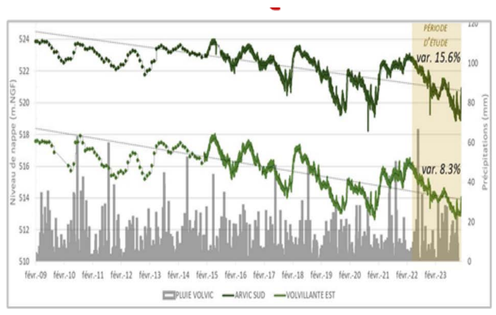
LAND MAPPING



GEOLOGICAL IMAGING

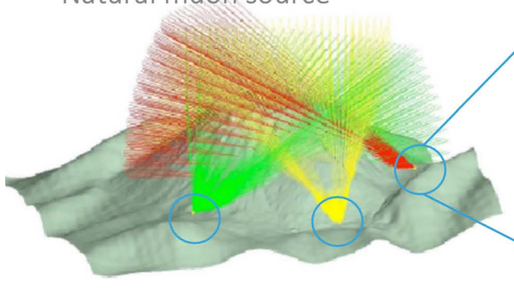


HYDROGEOLOGY

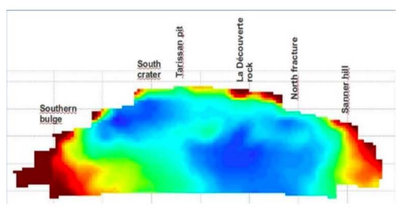


Geophysical imaging and petrophysical measurements

Muon tomography:
Natural muon source



Measure muon absorption → imaging



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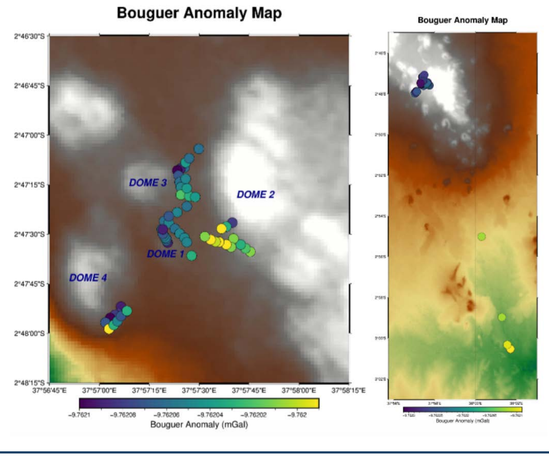

Mapping of the volcanic edifice

- Geophysical imaging of the near-surface geological structure
- Estimation of the porosity (muon tomography) and the density (gravimetry) of the dome
- Rock samples and lithological constraints

Time-lapse geophysical monitoring to extract possible variations due to the water content between rainy and dry periods (rainwater infiltration, groundwater flows, and aquifer recharge)