

Monitoring water level and volume of Buyo and Kossou dams in Côte d'Ivoire using optical and radar satellite imagery



(List of the project team members starting with Co-PIs)

Scientific Background and Objectives

Background

- Cote d'Ivoire like many countries in west Africa is experiencing climate change impact such drought which affect water resources
- Kossou and Buyo lakes and reservoirs, two large water reservoirs that are strategic for the Ivorian economy in terms of both agricultural and energy production, have experienced variations in water levels in recent years
- Difficulties in monitoring lakes using conventional methods (in situ measurements and hydrological modeling)

What is the contribution of earth observation data to lake monitoring?

Objective

- Monitor water volume fluctuations by combining in situ data, satellite images and several satellite altimetry measurements.



Figure 1 : An almost empty dam near Bouaké (central Côte d'Ivoire).



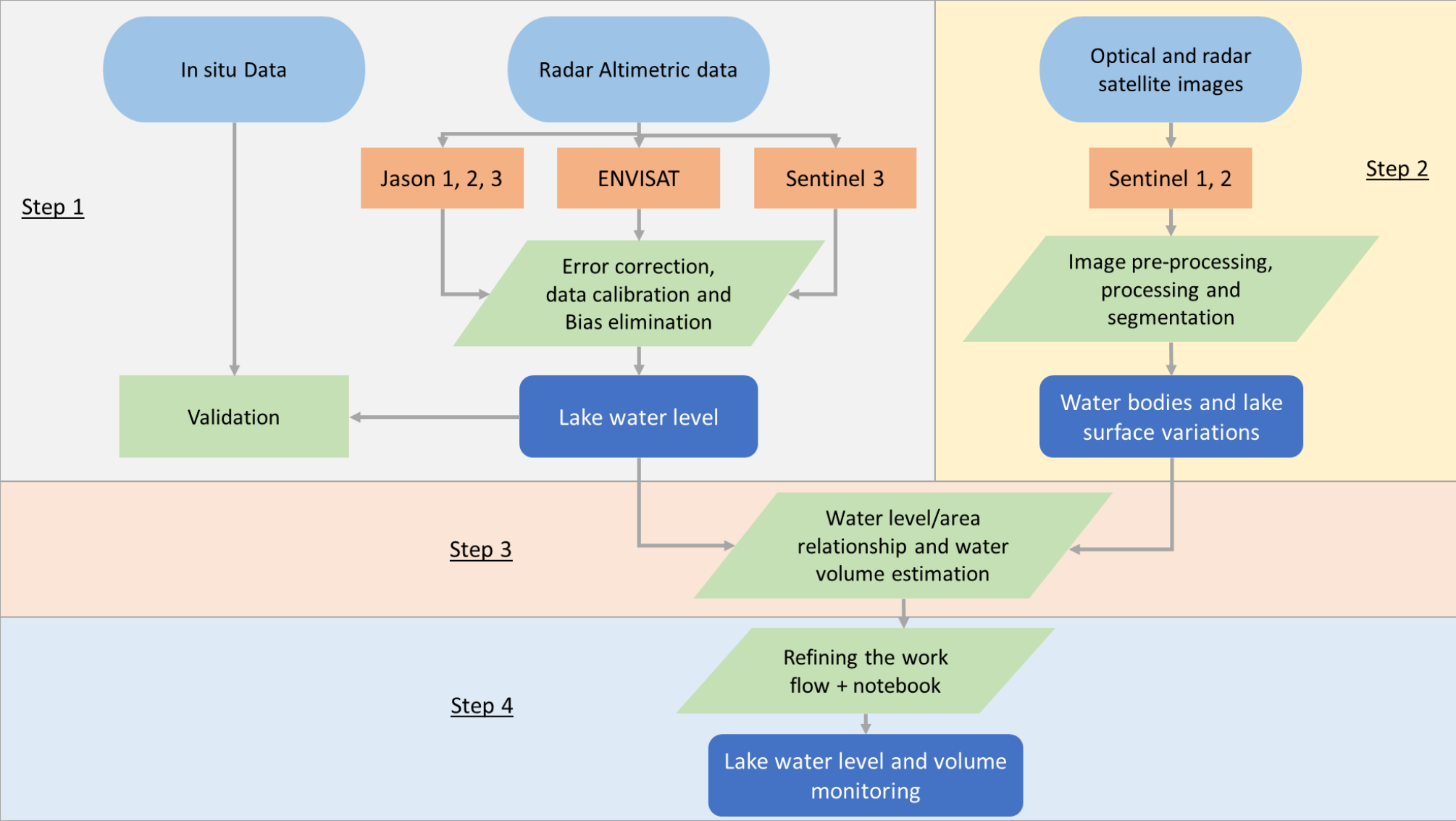
Figure 2 : Decrease of the water level in the lake dam of Kossou

- The study area includes the Kossou and Buyo lakes and their surroundings.
- Lake Kossou
 - Largest lake in Côte d'Ivoire.
 - It is located on the Bandama River in the center of the country.
 - It is an artificial lake that covers an area of 1700 km² and created in 1973 by the dam of the Bandama River in Kossou.
- As for Lake Buyo,
 - It owes its existence to the construction of a hydroelectric dam in 1981 on the main river Sassandra.
 - It has an area of about 600 km².
- From an environmental and socio-economic point of view, these lakes are of great interest to the country as they contribute to electricity supply, drinking water supply, agriculture, fishing, forestry area, etc.



Figure 3 : geographic location of the two lakes (Buyo and Kossou)

Research Outline



At the methodological level

The project will develop methods and processing chains (Notebook) for operational applications to improve knowledge on shortages and impacts of climate change on water resources in Côte d'Ivoire; this method could be replicated on other African lakes and could be used to implement a monitoring system and integrated management of water resources for sustainable development.

At the decision-making level

This project will make available for each lake, useful information for hydrological monitoring by users and decision makers of the structures in charge of water resources management in Côte d'Ivoire. It will accompany the development of a tool for monitoring and early warning in situations of shortage and abundance.

At the academic level

This project will support the design of educational resources for training and research at the Virtual University of Côte d'Ivoire (UVCI) and the Centre for Research and Application in Remote Sensing (CURAT).



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