West Africa Lake Monitoring System (WALMOST)

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Scientific Background and Objectives

Increasing environmental pressures

- Eutrophication
- Invasive species proliferation mainly **Water hyacinth**
- Uncontrolled spread of brush park fisheries : **Acadja**

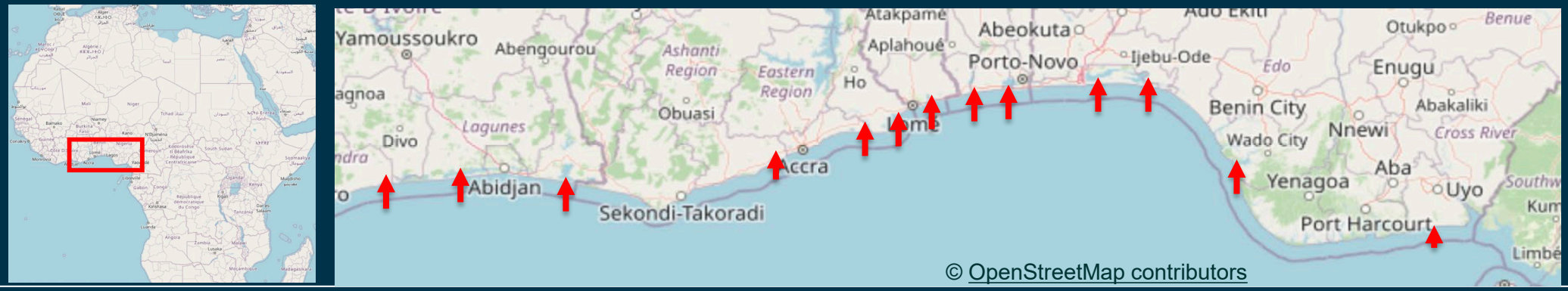
Challenges in monitoring and managing lakes in Africa and developing countries

- Data availability (water quality, hydrology, …)
- Cost of monitoring and control programs (equipment, maintenance, …)
- Need reference conditions for restauration

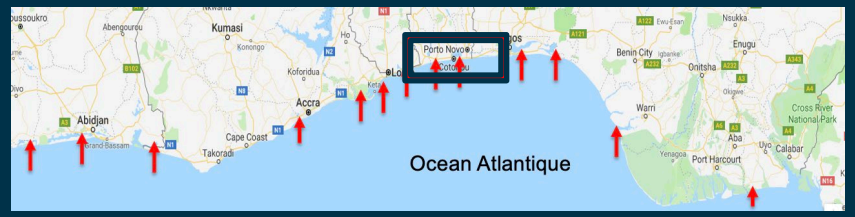
Management and **Restoration measures**

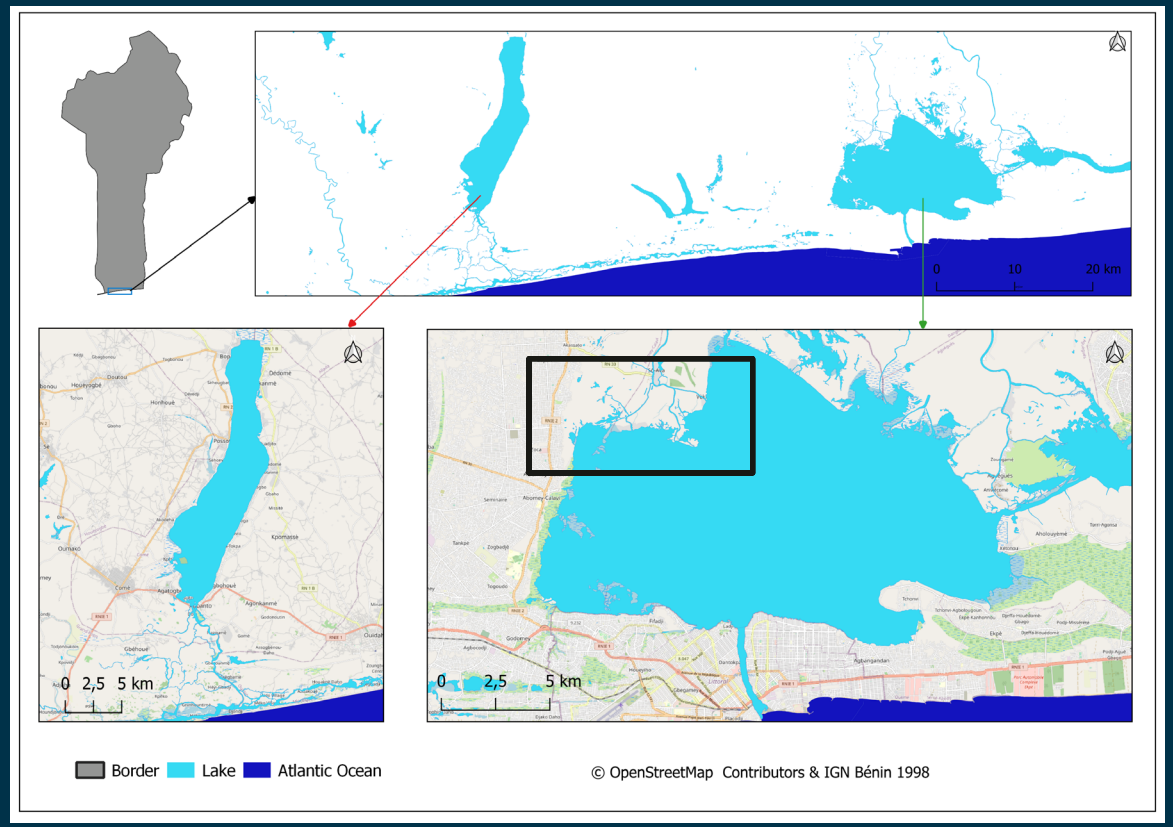
Policymakers need to evaluate the measures taken

Objective : Use EO data to develop an open-source online monitoring system on water hyacinth, acadja and water quality, for West African lakes to improve water management for food security

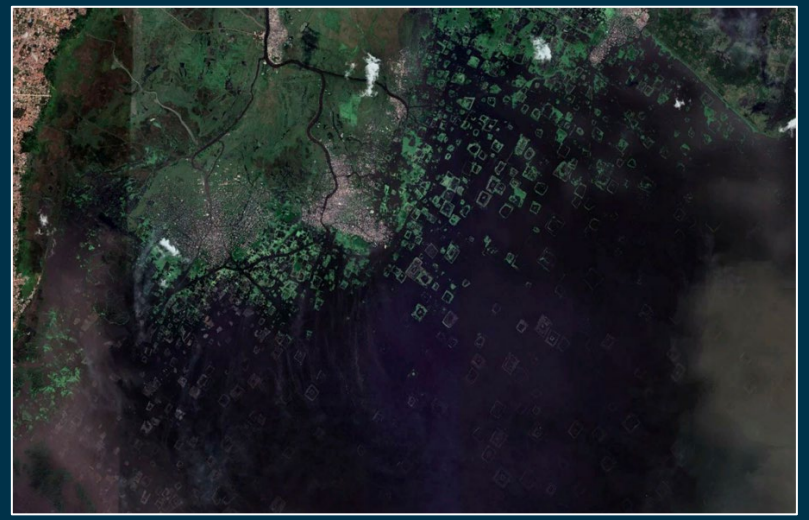


Study Area





- The study sites are lake Ahémé and lake Nokoué (Benin)
- Representative area of the conditions in West Africa lakes
- Two main phase with different environmental conditions
  - *High water period* (Sep to Nov) : - high nutrient input, high Chl-a - high water hyacinth - low use of acadja
  - *Low water period : (*Dec to Jul) : - internal nutrient recycling - low Chl-a - low water hyacinth - high use of acadja.



Research Outline

Development of the monitoring system (dashboard) includes 4 major points

- Detection of water hyacinth
- Detection of acadjas
- Detection of Chl-a
- Mapping of fish habitats

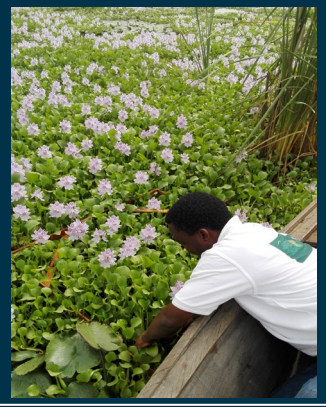
Supervised classification using Sentinel 1 and 2 images

Develop a qualitative fish habitats indicator, combining the 3 components

- Combining both SAR and optical data. SAR backscatter because :
  - not hampered by clouds and
  - has the potential to separate water from other objects in lakes
- Including indices : NDVI and others
- Based on previous research on the lake

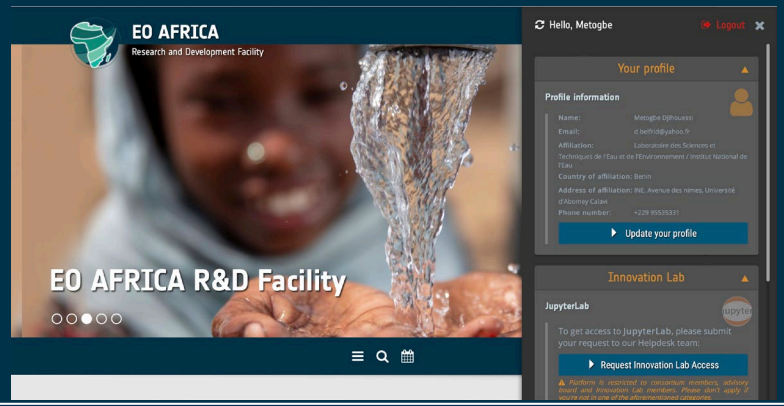
Data source

- Historical data from local institutions
- Additional field data will be collected



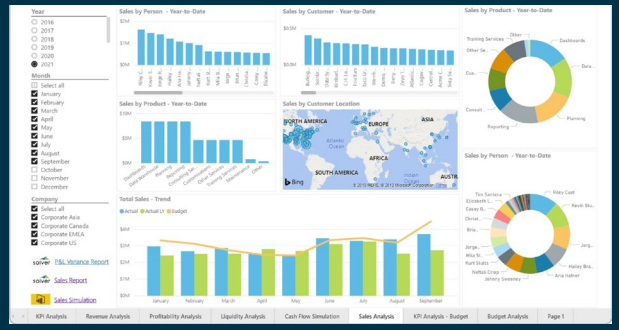
Calibration / validation / coding

- Innovation lab (calculation infrastructure)
- Coding in Jupiter Note



Dashboard development

- Innovation lab
- Involvement of stakeholders in the design of the dashboard



Project Team

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