

West Africa Lake Monitoring System (WALMOST)

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→ THE EUROPEAN SPACE AGENCY



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



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🔲 Border 🔜 Lake 🔜 Atlantic Ocea

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- 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 :
 - o 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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