

“Strengthening regulatory framework and national capacity for monitoring effluent discharges, water, and sediment quality in coastal and marine areas of Madagascar”

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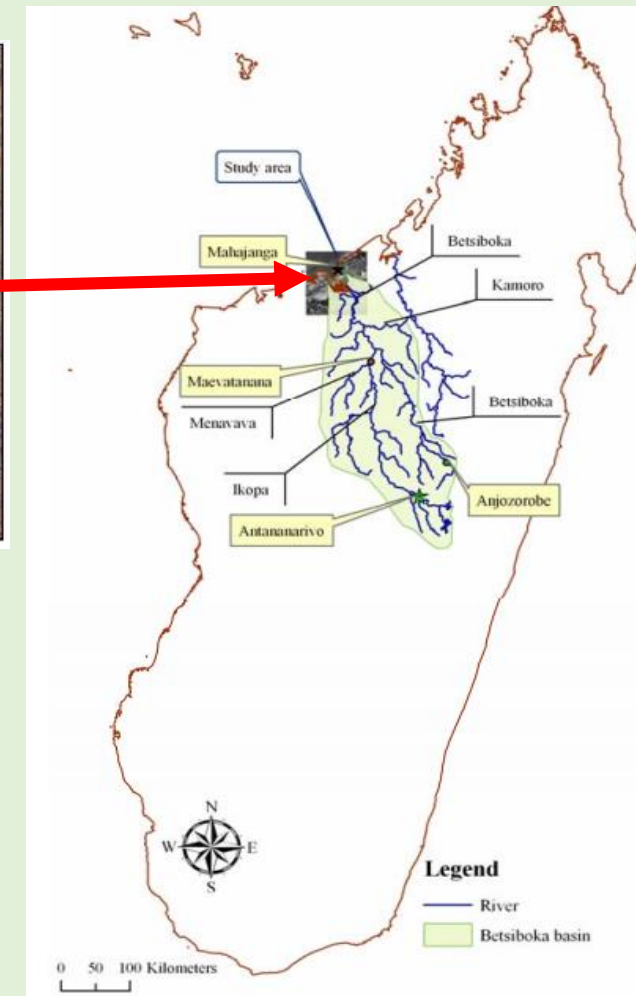
Project Background

- **Overall Objective:** To improve the water quality and therefore, the health status of land-based activities affected marine and coastal ecosystems of the River Betsiboka estuary (including the Bombetoka Bay)
- **Specific Objectives:**
 - Objective 1: To improve the MEED and its regional capacity to effectively manage and regulate land-based sources of pollution and activities;
 - Objective 2: To increase existing national monitoring capacity to help implement and monitor effluent discharges, water and sediment quality in receiving coastal and marine environment;



Project Background

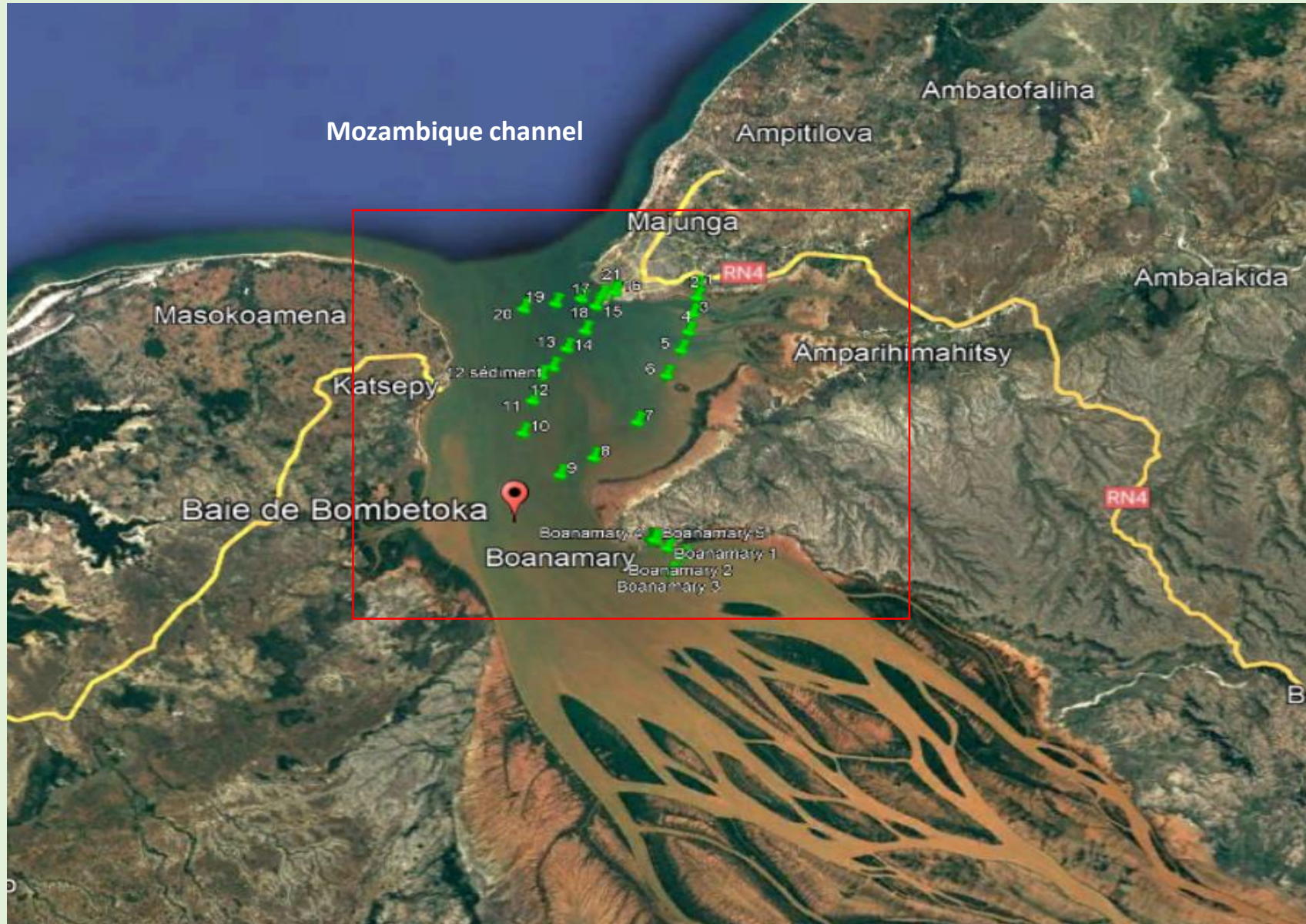
- Project Location: located in the northwestern part of Madagascar, the River Betsiboka estuary/delta is the mixing zone of fresh water from its watershed and salt water from Mozambique Channel



- Key project partners and their roles:
 - Ministry of Environment and Sustainable Development (MEED): Coordinator of activities;
 - National Centre for Environmental Research: project implementer;
 - DREED Boina: partner and Beneficiary of the project
 - results

Figure 1. The Betsiboka basin, its sources and location.

Demo project location: sampling points



Key Planned Activities

- Developing a decision support tool combining the use of pollution indices and GIS to simplify the comprehension of the estuary quality status and improve the way of conveying information to decision-makers by avoiding long annoying report;
- Introducing and validating the decision support tool by stakeholders;
- Strengthening the Boina DREED capacity to address and manage land-based sources of pollution impacting the estuary
 - Training of control officers on decision support tool handling (training extended to other 4 region's representants in the north);
 - Training on identification of land-based sources, identification sampling points, water & sediments sampling, and field measurement;
- Effective implementation and enforcement of a national regulatory framework for effluent discharges and standards for receiving water and sediment quality within the Betsiboka estuary catchment:
 - Mapping sensitive ecosystem (mangrove areas) and uses within the estuary;
 - Mapping activities and identification of pollution sources



Key Planned Activities

- Effective implementation and enforcement of a national regulatory framework for effluent discharges and standards for receiving water and sediment quality within the Betsiboka estuary catchment:
 - Identification of sampling points;
 - Campaign of monitoring (dry and wet season) + field measurements
 - Laboratory analysis;
 - Data analysis using decision support tool;
 - Comparison of data with regionally adopted EQT;
 - Defining interim EQT;
 - Drafting monitoring framework;
 - Adoption of EQT + national monitoring framework
- Strengthening existing monitoring structure's capacities (equipment + human)
 - Strengthening monitoring capacity of CNRE and selected MEDD control officers



Key Achievements

- Validated Decision support tool used by CNRE and control officers from MEDD;
- Training of control officers on field sampling and measurement
- Training of CNRE and control officer from 5 regions to decision support tool manipulation (processing and handling data using the tool) and use (interpretation of results);
- Zonation of sensitive ecosystem and uses within the bay;
- Location of pollution sources affecting the estuary and the bay;
- Wet season campaign of sampling post-Covid 19;
- Analysis of sample at CNRE's laboratory;
- Use decision tool to handle wet season data;
- Comparison of obtained data with the regional interim EQT;
- Compliance of sampling points with the regional interim EQT
- Draft of national monitoring framework;

Decision support tool: components

ETUDE DE LA POLLUTION MARINE DANS LA BAIE DE BOMBETOKA

Valeurs des paramètres
physico-chimiques de l'eau de
mer

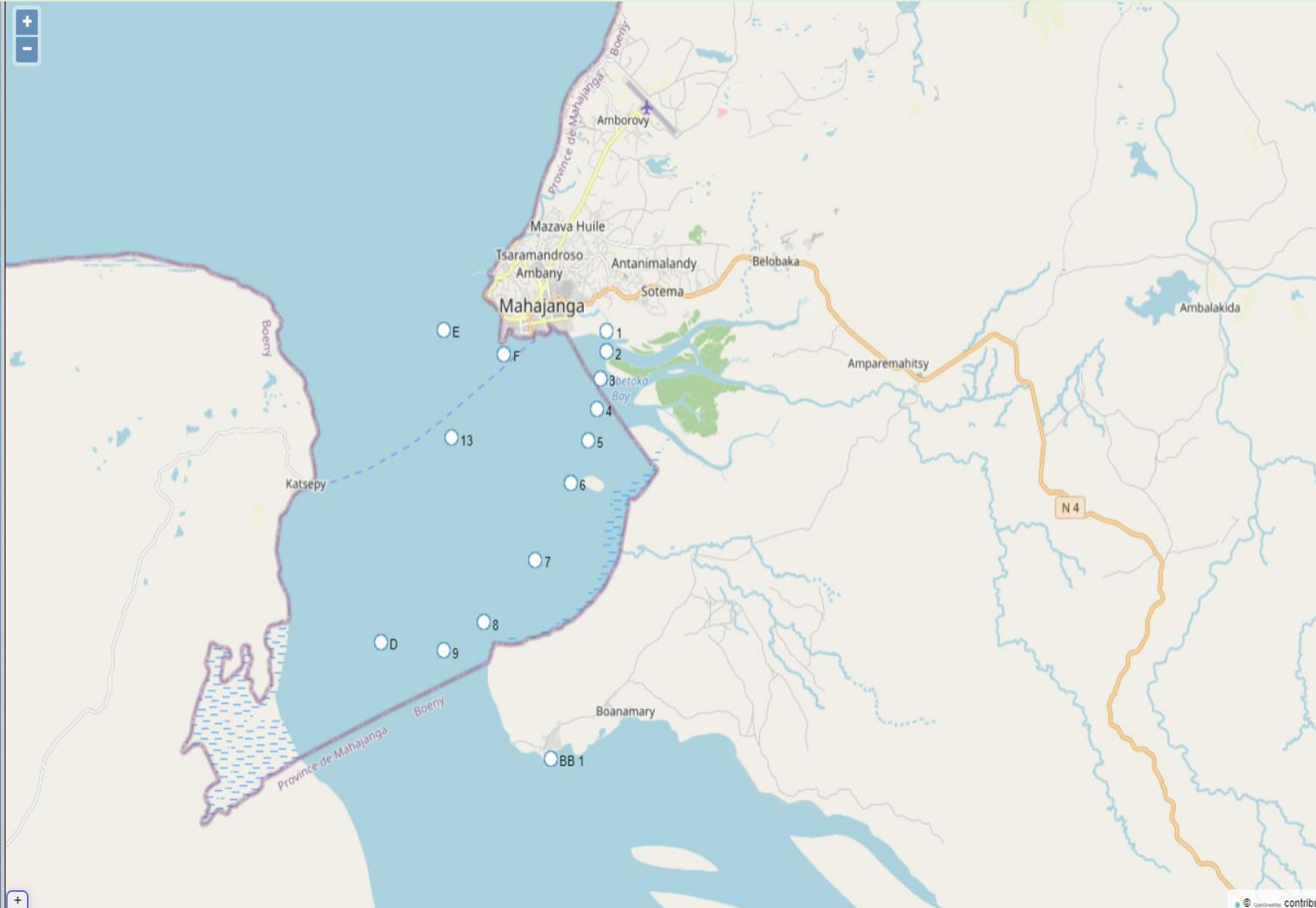
Concentration de métaux lourds
dans chaque sédiment marin

Analyse de Conformité par
rapport à la norme EQG

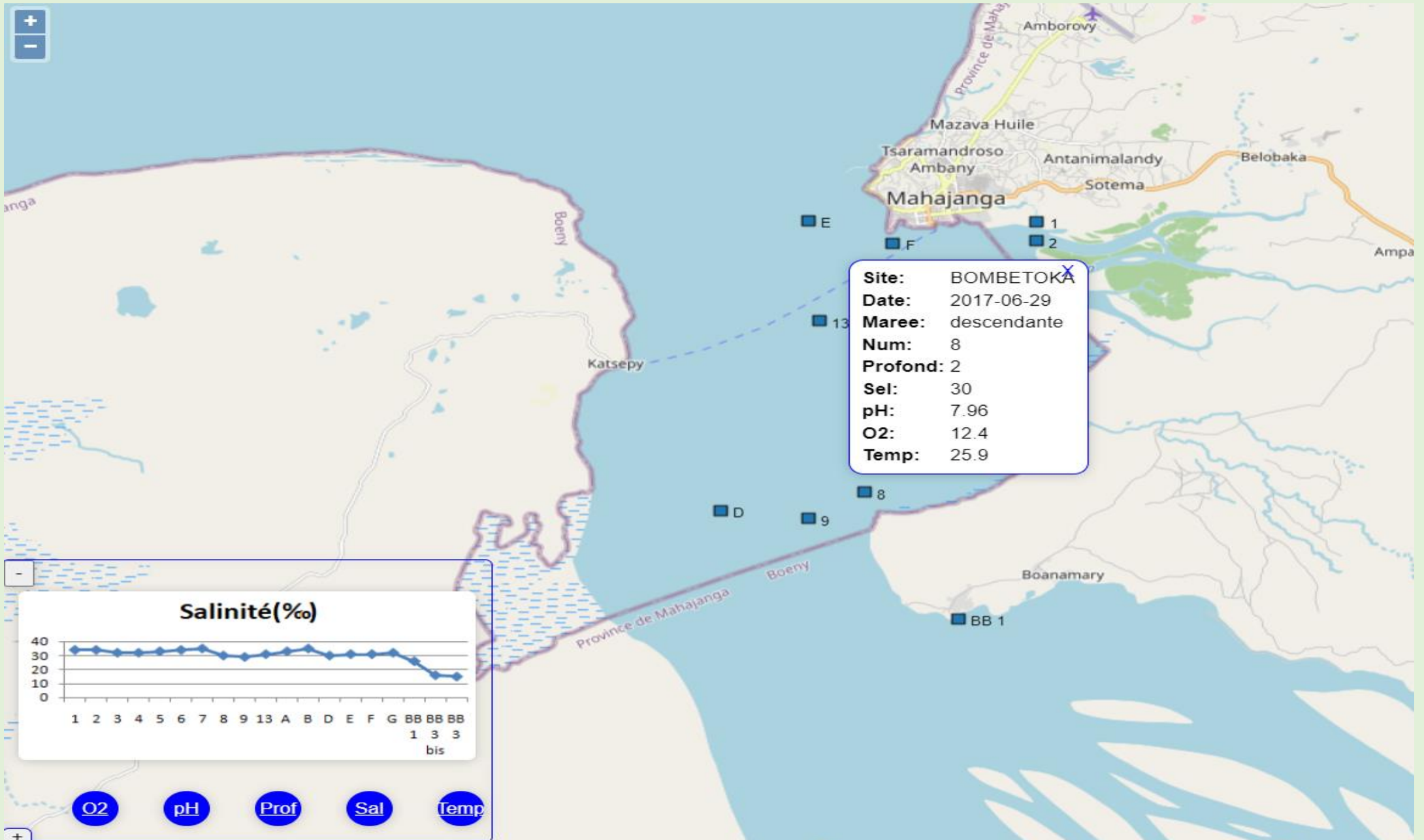
Analyse de la charge de
pollution par site (PLI)

Analyse du Facteur de
contamination par métaux
lourds (CF)

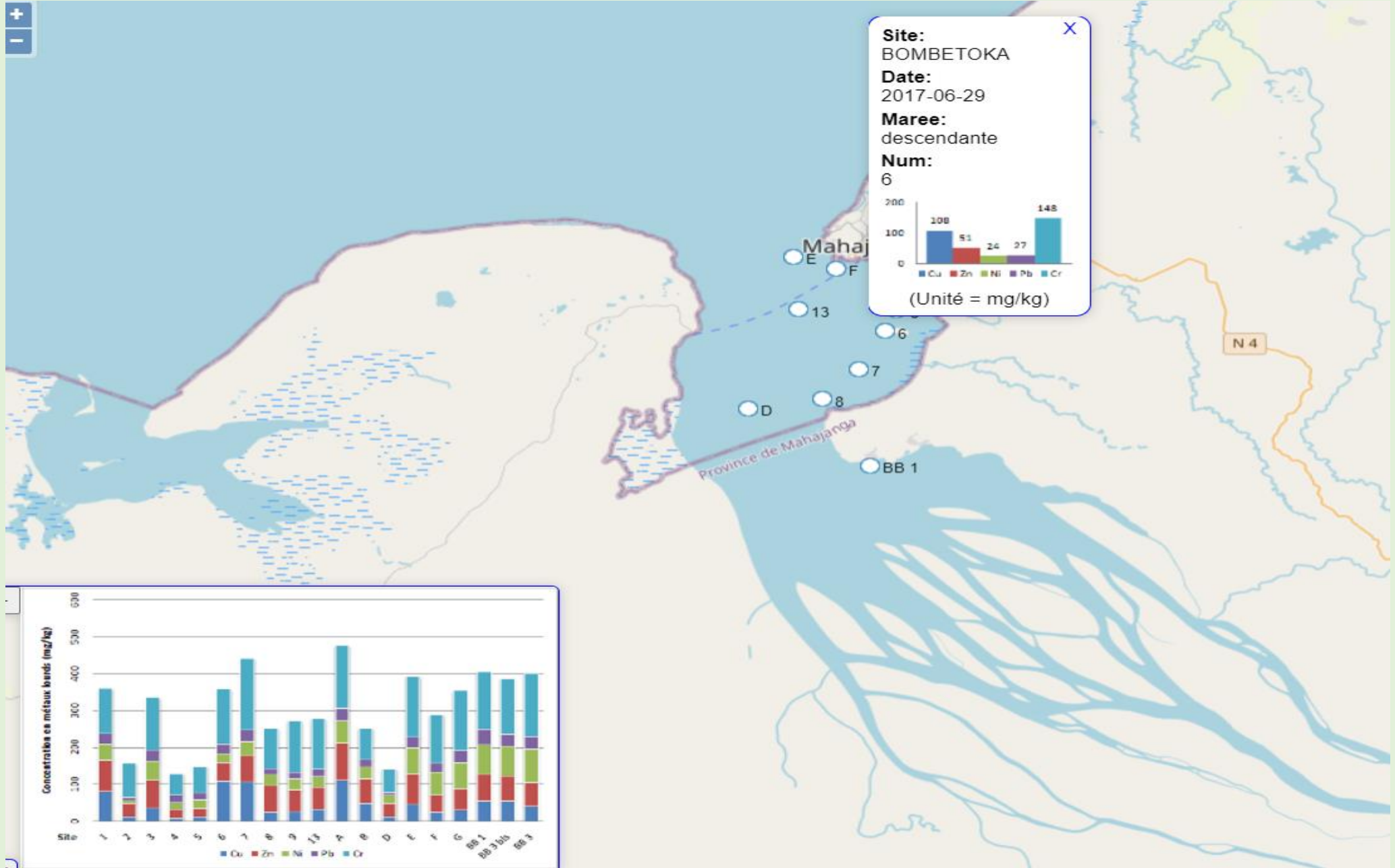
Analyse de l'Indice de
géaccumulation des métaux
lourds (Igeo)



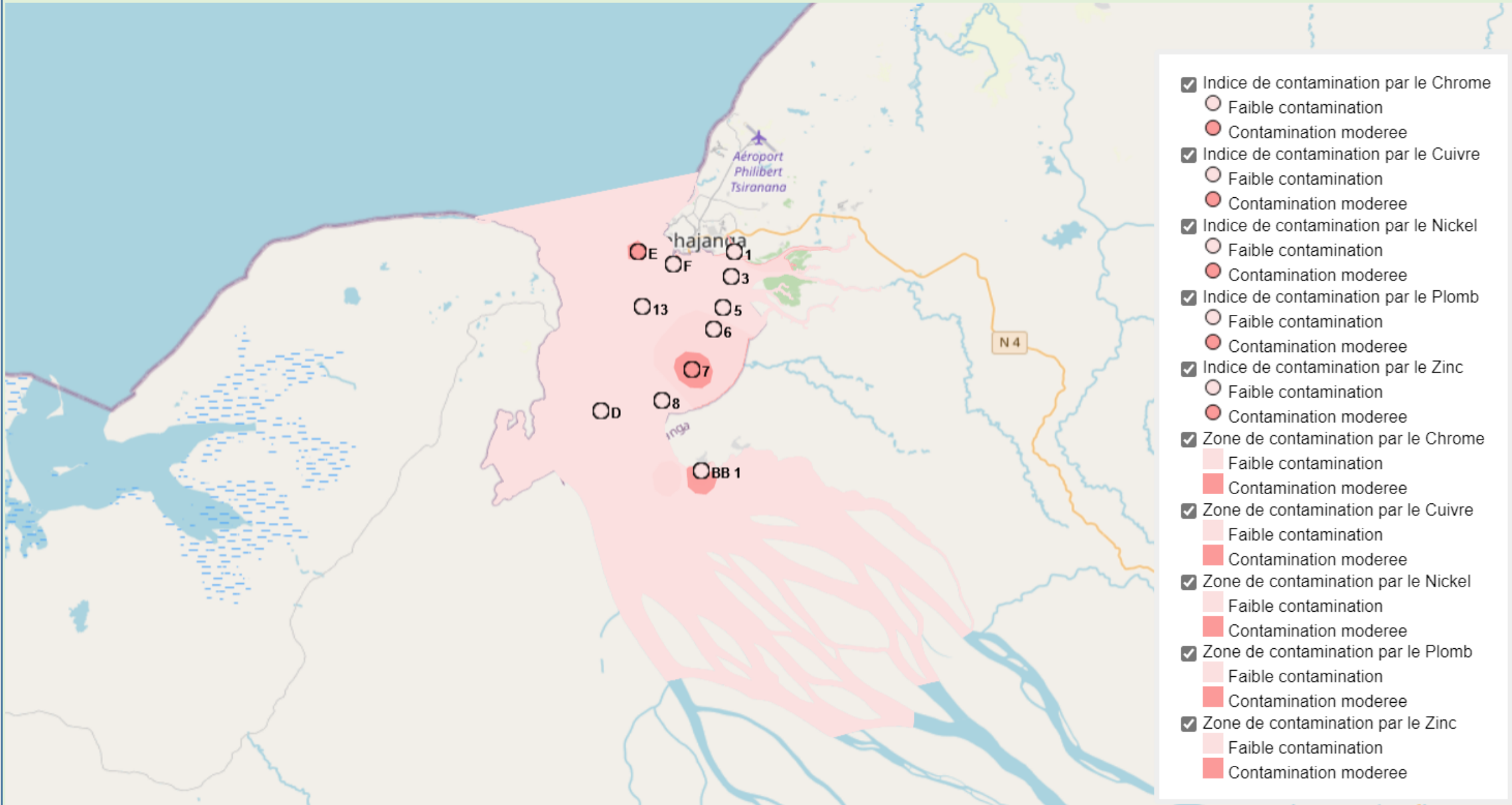
Decision support tool: water quality



Decision support tool: sediment quality



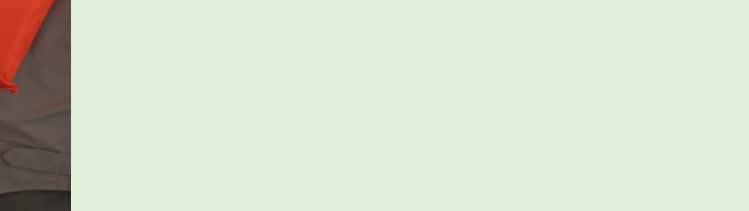
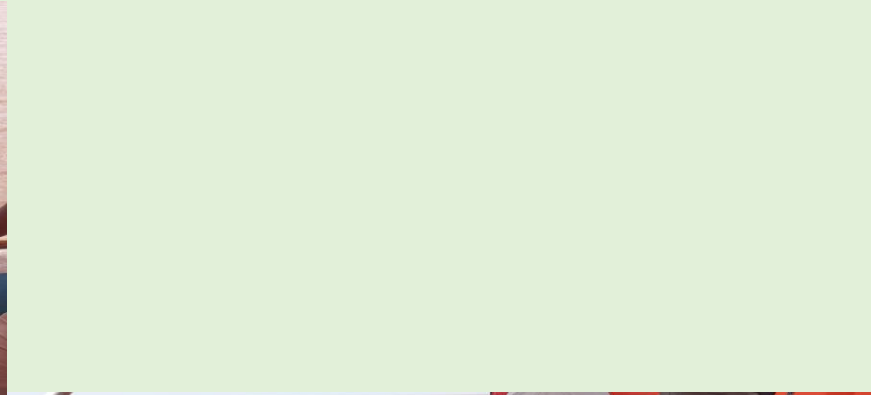
Decision support tool: classification of contamination level



Training of MEDD control officers: Decision support tool



Training of MEDD control officers: Field testing and sampling



Map of sensitive ecosystem and uses



Location of pollution sources affecting the bay



Key Challenges and Recommendations

- There is no national regulatory framework as regards marine pollution and coastal receiving waters that we have to start from scratch;
- Develop a regulatory framework on marine pollution and receiving environments using interim EQT;
- Monitoring framework to be updated and harmonized regionally;
- Laboratory equipment to strengthen technical capacities and effectively implement monitoring framework should be considered;
- **Recommendations:**
 - Support for regulatory framework and monitoring framework
 - Consider strengthening lab technical capacities and equipment



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*Thank
you!*