

## **Characterization of the morpho-sedimentary dynamics at the scale of Benin coastal lagoon (between Grand-Popo and Togbin)**

Michael Tossou\*

*Département des Sciences de la Terre, Université d'Abomey-Calavi, 01 BP 526 Cotonou, Benin*

\*E-mail: michael.tossou@yahoo.fr

The understanding of the hydrodynamic and sedimentary functioning of the lagoons constitutes a preponderant element for the management of these environments as well as an indispensable base in the evaluation of the changes that know their rich biodiversity. The present study is based on sedimentological analyzes and bathymetric surveys to characterize the hydrosedimentary dynamics and the morphology of the coastal lagoon, one of Benin's four main water bodies. The coastal lagoon is part of the Ramsar site n°1017 and the Benin/Togo transboundary biosphere reserve of UNESCO.

From the sampling of superficial sediments from the lagoon using a grab and depth surveys, following the prerequisite transects, we carried out laboratory work such as sieving and also treatments using Folk & Ward formula, via the Excel spreadsheet, Origin software, ArcGIS10.3.

The morphology of the bottom of the coastal lagoon is not homogeneous with the presence of basin and depths varying between 0 and 5 m. The western sector of the lagoon, in direct relation with the Mono River and the mouth in ocean, records the deepest depths. According to the North-South transects carried out, the morphology of the lagoon bottom shows a scarcity of "U" type profiles, some "V" and a predominance of the intermediate type. In terms of sedimentology, granulometric indices of sandy facies in the coastal lagoon generally indicate average sands of average classification, almost symmetrical with mesocretic acuity. The Passega diagram reveals a transport by saltation or rolling of sands. The combination of Friedman, Moiola and Weiser diagrams indicates that sands are brought by streams and also remobilized from the coastal dune area adjacent to the lagoon.

A hydrodynamic zoning is established, characterized by a weak hydrodynamism of the eastern sector or Ouidah lagoon and a relatively strong hydrodynamism of the western sector or Grand-Popo lagoon, with a speed of the order of 0.78 to 1.4 m/s towards the bottom and a flow of 429 m<sup>3</sup>/s, at the Avlo beach station.

Ultimately, this work highlights the state of hydrodynamic variations of the lagoon, including an opposition between eastern and western sectors, the diversity of sources of sedimentary inputs and the realization of the first maps of lithofacies and bathymetric of this aquatic environment, tool essential to its monitoring in the face of future changes and a constantly changing context.

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