

# **Multilayer Perceptron Applied to the IOT Systems for Identification of Saline Wedge in the Magdalena Estuary – Colombia**

## **Authors**

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## **Abstract**

Maritime safety has become a relevant aspect in logistics processes using rivers. In Colombia, specifically in the Caribbean Region, there is the Magdalena River, a body of water that broadly borders the Colombian territory and is a tributary of various economic and public health activities. At its mouth, this river interacts with the sea directly, which generates a phenomenon called saline wedge, which is directly related to the sediments that must be continuously extracted and which threatens the proper functioning of the port from the city of Barranquilla, Colombia. Through this research, a network of sensors located in strategic places at the mouth of this river was generated, which allows predicting the behavior of the salt wedge. Using artificial neural networks, more specifically, the Multilayer Perceptron algorithm, it was possible to analyze the results of the implementation in light of the indicators or quality metrics, generating a highly reliable scenario that can be replicated in other sections of the river and in other aquifers.

## **Keywords**

IOT systems, Machine learning, Salt wedge, Aquifers, Magdalena river estuary, Multilayer Preceptron