



## **Using Fuzzy Analytic Hierarchy Process multicriteria and Geographical information system for coastal vulnerability analysis in Morocco: The case of Mohammedia**

Meryem Tahri (1), Mohamed Maanan (2), and Mustapha Hakdaoui (1)

(1) University Hassan II, Faculty of Science - Ben M'sik, Casablanca, Morocco (t.meryem4@gmail.com), (2) Université de Nantes, LETG-Nantes, UMR 6554, France

This paper shows a method to assess the vulnerability of coastal risks such as coastal erosion or submarine applying Fuzzy Analytic Hierarchy Process (FAHP) and spatial analysis techniques with Geographic Information System (GIS). The coast of the Mohammedia located in Morocco was chosen as the study site to implement and validate the proposed framework by applying a GIS-FAHP based methodology. The coastal risk vulnerability mapping follows multi-parametric causative factors as sea level rise, significant wave height, tidal range, coastal erosion, elevation, geomorphology and distance to an urban area. The Fuzzy Analytic Hierarchy Process methodology enables the calculation of corresponding criteria weights. The result shows that the coastline of the Mohammedia is characterized by a moderate, high and very high level of vulnerability to coastal risk. The high vulnerability areas are situated in the east at Monika and Sablette beaches. This technical approach is based on the efficiency of the Geographic Information System tool based on Fuzzy Analytical Hierarchy Process to help decision maker to find optimal strategies to minimize coastal risks.