

# **Application of Fuzzy Set Theory to predict Engineering Risk caused by an Ocean Discharge System in the Region of Pecem-Northeast of Brazil.**

Souza, Raimundo<sup>1, 2</sup> and Chagas, Patrícia<sup>2</sup>

Departamento de Engenharia Hidráulica e Ambiental

Centro de Tecnologia – UCF, Fortaleza Ceará Brazil; and

Cornell University, School of Civil and Environmental Engineering, Ithaca, NY

**Abstract:** The releasing of large quantity of wastewater in the region of Pecem, Northeast of Brazil, raises questions concerning with the environmental impact caused by that process, considering that, it is an intensity recreational area in the State of Ceara. This research uses the Fuzzy Set Theory to evaluate the risk of contamination, in that recreational beach, caused by a possible outfall structure in that region. The studying simulates the presence of this wastewater disposal structure, for different diffuser length, calculates the wastewater concentration close to the coastline, using the Brooks' methodology, and calculates the engineering risk, using a defined Membership Function for the  $T_{90}$ . The results have shown that the Fuzzy Set Theory is a very good way to predict Risk of Contamination in that environmental system.

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<sup>1</sup> Cornell University, School of Civil and Environmental Engineering, 466 Hollister Hall, Ithaca, NY, 14850

<sup>2</sup> Departamento de Engenharia Hidráulica e Ambiental, Centro de Tecnologia – UCF, Campus do Pici, P. O. Box 6018, 60451 - 970, Fortaleza Ceará. e- mails: [rs237@cornell.edu](mailto:rs237@cornell.edu) and [pfchagas@yahoo.com](mailto:pfchagas@yahoo.com)