
Economic appraisal of vulnerability reduction scenarios to coastal flood risk: how to save human's life in spending less money?

Axel Creach^{*1,2}, Sophie Pardo², and Denis Mercier¹

¹Littoral, Environnement, Télédétection, Géomatique (LETG - Géolittomer) – Université de Caen Basse-Normandie, Université de Nantes, Université de Bretagne Occidentale [UBO], CNRS : UMR6554, Université de Rennes II - Haute Bretagne, Université d'Angers, Université de Bretagne Occidentale (UBO) – Faculté des Lettres BP 81227 44312 NANTES Cédex 3, France

²Laboratoire d'économie et de management de Nantes Atlantique (LEMNA) – Université de Nantes : EA4272 – France

Résumé

Storm Xynthia hit French Atlantic coast in February 2010. It led to an important coastal flood which was responsible for the death by drowning of 41 people. Reports of the storm show that the consequences of Xynthia were the result of "dangerous situations": the aging population of coastal towns, urbanisation of low-lying areas, and architectural maladaptation of houses to coastal flood risk.

This presentation deals with the way to reduce these dangerous situations.

First, a methodology to evaluate the vulnerability of houses to coastal flood for inhabitants is proposed. It exposes the way to assess the potential number of death in case of coastal flood.

Secondly, an economic appraisal is conducted to compare different strategies to reduce vulnerability: (i) protection with dikes, (ii) adaptation of residential houses, (iii) prevention and warning, (iv) resettlement. Through the use of Cost-Efficiency Analysis (CEA), the relevance of each of the measures is evaluated through the number of human lives protected.

This analysis shows that dikes are not a viable solution in the only goal of protecting human life. In contrast, it recommends focusing more on prevention and warning measures which are less expensive and can lead to an important efficiency.

Structural solutions, like adaptation of residential houses and resettlement, are most expensive but could offer great benefits in protecting human life, depending of the level of vulnerability.

The study suggests it could be useful to mix structural and non-structural solutions in order to protect human life against coastal floods.

Mots-Clés: coastal risk, coastal flood, vulnerability, mortality, climate change, economic appraisal, cost, efficiency analysis, single, storey houses

*Intervenant