Regional Frequency Analysis of Ocean Hazard

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The estimation of the extreme return level (up to 10-4 annual probability of exceedence) of natural phenomena is a very uncertain exercise, when extrapolating using the information and the measure collected in a single site. The aim of the Regional Frequency Analysis (RFA) is to benefit from the information contained in observations and data collected not only on the site of interested but in a larger set of sites, located in the same region of the site of interest or sharing with it similar characteristics. This technique was introduced in the '60 and widely used in various domains including hydrology and meteorology. The RFA was recently acknowledge as a potential choice for the estimation of flooding hazard in the Methodological Guide for flooding hazard estimation [1], published in 2013 by the French Nuclear Safety Autority. The aim of this presentation is to bring in the main concepts of the RFA and illustrate the latest innovation on its application, delivered by EDF R&D. They concerns the statistical definition of storms, the formation of homogeneous regions and a new approach for filtering the redundant information linked to the spatial correlation of natural phenomena. Application to skew surges and waves will be shown

1. ASN, Guide pour la Protection des installations nucléaires de base contre les inondations externes. 2013, ASN. p. 44.