Atelier « Modélisation des risques environnementaux et événements extrêmes » 28 au 31 août 2017

> Workshop "Environmental Risk Modeling and Extreme Events" August 28-31, 2017

Flexible models for spatial extremes

Jenny Wadsworth *

j.wadsworth@lancaster.ac.uk

Many environmental processes exhibit weakening spatial dependence as events become more extreme. Well-known limiting models, such as maxstable or generalized Pareto processes, cannot capture this, which can lead to a preference for models that exhibit a property known as asymptotic independence. However, weakening dependence does not automatically imply asymptotic independence, and whether the process is truly asymptotically (in)dependent is usually far from clear. The distinction is key as it can have a large impact upon extrapolation, i.e., the estimated probabilities of events more extreme than those observed. In this talk I aim to present two recent approaches for modelling spatial extremes that allow for flexibility in the limiting dependence structure. The first approach allows for the dependence class as part of the inference, and can be estimated in moderate dimensions. The second approach is a conditional one, for which various structures can be specified and estimated in reasonably high dimensions. In both cases, the methodology will be applied to a dataset of North Sea significant wave heights.

This is based on joint work with Raphaël Huser, and Jonathan Tawn and Robert Shooter.

^{*}Department of Mathematics and Statistics, Lancaster University, Fylde College, Lancaster, LA1 4YF, UNITED KINGDOM