

Better Risk Management through improved empirical insight.

A. Andrianova, L.A. Smith

September 17, 2004

Risk and Regulation strategies can often benefit from insight into the likelihood of occurrence of various events and conditions. In particular, estimates for the occurrence of various types of weather over a season are useful in a wide variety of policy and risk management applications, including both hedging (weather derivatives) and operational risk management (supply and logistics). Traditional statistical methods are typically ineffective in estimating this information from limited observations. The available historical weather observations are often too short to estimate the statistics of interest. A new statistical approach to dynamic simulation of synthetic environmental time series (e.g a weather generator) is presented. Ensemble Random Analog Prediction (ERAP) method constructs synthetic scenarios by generating ensembles which are consistent with the statistics of the historical data. The method is tested both on a known nonlinear process, where the long term statistics are accessible, and on actual weather data. Finally, limitations of the method and remaining questions are explored.