VolkswagenStiftung

# Compound Events: muLtivariate statisticaL mOdeling (CE:LLO) - extension

Initiative: Modellierung und Simulation komplexer Systeme (beendet)

Ausschreibung: Extremereignisse: Modellierung, Analyse und Vorhersage

Bewilligung: 07.07.2014

Laufzeit: 3 Jahre

Compound events are major extreme events that result from the joint occurrence of underlying contributing events. Typical examples are drought in conjunction with a heatwave, and a storm surge coinciding with heavy precipitation causing river flooding. In order to fully describe the dependence structure and to correctly assess their severity, multivariate statistical models are required. Furthermore, the inclusion of physical predictors is necessary to gain insight into the temporal variability and their dependence structure. So far, no multivariate statistical models including predictors to describe compound events have been formulated. This project aims at such a multivariate statistical model with predictors based on pair copula constructions. The model is developed for a wide class of compound events. In particular, the model will be applied to the drought and flood examples mentioned above. To this end the team plans to analyse the severity, variability and underlying physical mechanisms of compound events in the observational record. The representation of such events by dynamically downscaled global climate models can give hints on potential future changes.

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**Open Access-Publikationen**

**Multivariate statistical modelling of compound events via pair-copula constructions: analysis of floods in Ravenna (Italy)**
**Soil Moisture Drought in Europe: A Compound Event of Precipitation and Potential Evapotranspiration on Multiple Time Scales**