Geophysical Research Abstracts
Vol. 13, EGU2011-9940, 2011
EGU General Assembly 2011

A comparison of spatial and temporal methodologies for the analysis of European drought

Geraldine Wong and Lena M Tallaksen
Department of Geosciences, University of Oslo, Norway (lil.ms.meanie@gmail.com)

Drought is a global phenomenon and a common characteristic of climate. Over the past century, drought in Europe has affected both rural and urban population and has serious environmental and economic impacts. It is thus essential for appropriate water resource management to be established to mitigate these effects. Hence, it is imperative to consider the spatial and temporal characteristics of drought when assessing the characteristics of future extreme events. Important drought characteristics include its severity, frequency, duration and spatial extent. Severity-Area-Frequency (SAF) analysis is commonly used to evaluate the drought severity of an extreme drought event with respect to its spatial scale, as well as its return period. Using gridded surface and subsurface flow data from global hydrological and land surface models, hydrological drought events are first identified and their severity is calculated. The spatial extent of a drought event is analysed using different clustering algorithms and the results are discussed in detail. Based on these algorithms, SAF curves are constructed that relate the drought spatial extent to its severity and frequency. The corresponding SAF curves for each model are compared and evaluated in terms of their severity and spatial extent. Preliminary results show that there is a higher sensitivity to change in mean drought severity for smaller drought areas as compared to larger drought and this is more noticeable for shorter return periods. These preliminary results could eventually lead to a predefined threshold for drought spatial extent. The implications of temporal correlations between successive drought events within the spatial framework are further discussed and attempts of incorporating this into the analysis are examined.