Hydrol. Earth Syst. Sci. Discuss., 6, C1326–C1328, 2009
www.hydrol-earth-syst-sci-discuss.net/6/C1326/2009/

Hydrology and Earth System Sciences Discussions

Interactive comment on "Observed drought and wetness trends in Europe: an update" *by* I. Bordi et al.

Anonymous Referee #2

Received and published: 24 June 2009

In this paper, trends in drought and wetness indices (derived from the gridded Standard Precipitation Index) are analysed for Europe. The analysis is conducted using linear and non-linear techniques on several scales: 1) merging the information in space and looking at two time scales (3 and 24 months); 2) analysing the spatial variability of trends in the case of the 24-months time scale; 3) showing how the trends differ in 4 particular (local) situations. Emphasis is devoted to the inclusion of the last 10 years of observations in the analysis, which is the "update" mentioned in the title.

The paper shows that the recent evolution of wetness in Europe disagrees with the decreasing trend "detected" until about the end of the last century. A non-linear trend analysis (Singular Spectral Analysis) is proposed as a good descriptor for the consid-

Full Screen / Esc
Printer-friendly Version
Interactive Discussion
Discussion Paper

ered time series.

The work is well explained and the methodologies applied seem appropriate. Therefore I recommend the publication of the paper in HESS after a minor revision regarding one point, which is also raised by Koutsoyiannis (2009) at point 8.

In the first part of the introduction (till line 11 page 3893), the problem of predictability of droughts in a changing (or variable) climate is stressed. The analysis of climatic trends is seen as a mean "to shed light" on it. As an engineer[1], I am interested in the practical outcome of such a work, and so in prediction: will droughts increase/decrease in the next years? Which uncertainty is related to such predictions? The analysis in this paper shows that if one would have predicted the future evolution of droughts in 1997 assuming a linear trend (for the period 1949-1997), would have been grossly in error.

My questions are: what would one have predicted by using the outcomes of the non-linear trend analysis? And how? One possible way could be the one suggested by Koutsoyiannis (2009), i.e., to use the Hurst-Kolmogorov dynamics. Maybe you have in mind other ways, which you should discuss (at least in the conclusions). This would provide a way to "take into account (the results of the paper) in drought risk assessment and in planning proactive measures to limit the negative impacts of drought and wetness in Europe" (last sentence in the conclusions).

Specific comments:

Lines 4-5 page 3892: the authors use the wording "meteorological and hydrological aspects", which is not well defined. I would relate "meteorological" with "seasonal" and "hydrological" with "bi-annual" more clearly.

Pages 3896-3897: the Singular Spectral Analysis is summarised in a synthetic way

[1]To be honest, I think that prediction (in a broad sense) is not only an engineering need, but is the objective of science itself.

HESSD
6, C1326–C1328, 2009

using equations. Would it be possible to add some lines to state (in simple words) which are the distinctive features of non-linear trend analyses, what distinguish this method (SSA) from other techniques and why it has been chosen?

Technical corrections

Table 1: the confidence bounds are listed in the wrong columns.

References

Koutsoyiannis, D. (2009) Interactive comment on "Observed drought and wetness trends in Europe: an update" by I. Bordi et al., HESSD, 6, C1298-C1303.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 6, 3891, 2009.