

## ***Interactive comment on “How unusual was autumn 2006 in Europe?” by G. J. van Oldenborgh***

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Some comments and suggestions on the interesting paper on the exceptional warm conditions in Europe during autumn 2006.

Comment on the return value part: The return period is defined as the expected number of years until a given threshold is exceeded. Luterbacher et al. (2004) followed another way than van Oldenborgh and estimated the return period based on the assumption that the averaged seasonal European surface temperature data follow a varying trend over the years and that also the return period of a particular event changes over time. To estimate the return period of an event given the state of the trend they assumed a Gaussian distribution with a time-dependent mean function and independent residuals with a constant variance. The trend was modeled by a spline function. The selected model belongs to the class of parametric additive models (e.g. Hastie

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and Tibshirani 1990). The degrees of freedom were chosen such that the adjusted R-squared is maximized. Luterbacher et al. (2004) also calculated time-dependent 95% confidence intervals for the estimated return period. I can imagine, that this way of calculating return periods with the time-dependent 95% confidence levels is a more appropriate method that could also be applied in this study.

Recently, Luterbacher et al. (2007) reported on the exceptional European warmth of autumn 2006 and winter 2007, historical context, the underlying dynamics, and its phenological impacts. I would suggest to incorporate those results of Luterbacher et al. (2007) in the different parts of the paper and connect your findings with the published evidence.

Figure 2: Could you please clarify in the text and in the caption what this figure is exactly showing? Is it the mean September-November 2006 (not 2007 as indicated in the caption) minus the average of 1500-2002 (from Xoplaki et al. 2005) or minus the warmest autumns covering the past centuries? It would be nice if you could apply some kind of significance test in this anomaly temperature composite. One possibility would be to apply a so-called scaled mean and modified t values that are particularly useful for small samples or in cases where the data distribution is unknown or known to be non-Gaussian (Brown and Hall 1999). You may expand a bit on the interpretation of Figure 2.

Some additional small comments:

Page 813, first para: please change "the warmest autumn since 1500" to very likely the warmest autumn since 1500

Page 819, line 16. You may also add the following reference after Seneviratne et al. 2006: Fischer, E. M., S. I. Seneviratne, D. Lüthi, and C. Schär (2007), Contribution of land-atmosphere coupling to recent European summer heat waves, *Geophys. Res. Lett.*, 34, L06707.

## References used:

Brown TJ, Hall BL (1999) The use of t values in climatological composite analyses. *J Clim* 1:2941-2945

Hastie, T., R. Tibshirani, *Generalized Additive Models* (Chapman and Hall, London, 1990).

Luterbacher, J., Dietrich, D., Xoplaki, E., Grosjean, M., and H. Wanner, 2004: European seasonal and annual temperature variability, trends and extremes since 1500, *Science*, 303, 1499-1503.

Luterbacher, J., M. A. Liniger, A. Menzel, N. Estrella, P. M. Della-Marta, C. Pfister, T. Rutishauser, and E. Xoplaki (2007), Exceptional European warmth of autumn 2006 and winter 2007: Historical context, the underlying dynamics, and its phenological impacts, *Geophys. Res. Lett.*, 34, L12704.

Xoplaki, E., Luterbacher, J., Paeth, H., Dietrich, D., Steiner N., Grosjean, M., and Wanner, H., 2005: European spring and autumn temperature variability and change of extremes over the last half millennium, *Geophys. Res. Lett.*, 32, L15713.

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3, S432–S434, 2007

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