

## DISCUSSION of “Editorial—Searching for change in hydrological data”\*

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Kundzewicz (2004) told the readers of *Hydrological Sciences Journal* only half of our results (Mudelsee *et al.*, 2003). As he noted, we found no significant trend in the occurrence of extreme summer (May–October) floods in two major rivers (Elbe and Oder) in central Europe over the past few decades. However, we also analysed floods during winter (November–April) finding significant *downward* trends. For both rivers, we are able to relate the fewer winter floods to fewer events of strong river freezing. Breaking river ice at the end of winter may act as a water barrier and enhance a flood severely. Fewer river freezing events could be the result of water pollution and/or climatic changes. In the case of summer floods, we would be cautious to set an “increase in intense precipitation” equal to an “increase in flood risk”, as Christensen & Christensen (2003), and seemingly also Kundzewicz (2004) did. Between intense precipitation and floods, we have the soil and a variety of runoff-modifying factors. Furthermore, the increase of intense precipitation needs to be related to the actual catchment sizes. This has not been done in case of the Oder and Elbe.

We also note that Kundzewicz’s (2004) view that the absence of a significant trend “cannot be interpreted as a demonstration of the absence of change” is misleading. This notion seems to suggest (as Kundzewicz (2004) does in the same paragraph) that the summer flood records were merely too short and that, using future records that last longer, a “positive result” (significant upward trend) would emerge. In hypothesis testing, which is a standard tool in statistics, the very opposite (significant downward trend) could equally result. Additionally to hypothesis testing, Mudelsee *et al.* (2003) did calculate confidence bands using extensive computer simulations, around the time-dependent flood occurrence rate. We are not aware of other statistical methods able to achieve that difficult task, given the strong natural variability. These bands confirm: no significant change in summer flood occurrence. Unfortunately, Kundzewicz (2004) fails also here to inform his readers.

## REFERENCES

- Christensen, J. H. & Christensen, O. B. (2003) Severe summertime flooding in Europe. *Nature* **421**, 805–806.  
 Kundzewicz, Z. W. (2004) Editorial—Searching for changes in hydrological data. *Hydrol. Sci. J.* **49**(1), 3–6.  
 Mudelsee, M., Börngen, M., Tetzlaff, G. & Grünewald, U. (2003) No upward trends in the occurrence of extreme floods in central Europe. *Nature* **425**, 166–169.

\* Kundzewicz, Z. W., *Hydrological Sciences Journal* **49**(1), 3–6.