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Hydrol. Earth Syst. Sci., 14, 2367–2382, 2010
www.hydrol-earth-syst-sci.net/14/2367/2010/
doi: 10.5194/hess-14-2367-2010

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Streamflow trends in Europe: evidence from a d of near-natural catchments

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Abstract. Streamflow observations from near-natural catchments a
paramount importance for detection and attribution studies, evalu
large-scale model simulations, and assessment of water managem
adaptation and policy options. This study investigates streamflow
a newly-assembled, consolidated dataset of near-natural streamfl
records from 441 small catchments in 15 countries across Europe.
period 1962–2004 provided the best spatial coverage, but analys
also carried out for longer time periods (with fewer stations), start
1932, 1942 and 1952. Trends were calculated by the slopes of the
Theil robust line for standardized annual and monthly streamflow,
as for summer low flow magnitude and timing. A regionally coherer
of annual streamflow trends emerged, with negative trends in sou
and eastern regions, and generally positive trends elsewhere. Tre
monthly streamflow for 1962–2004 elucidated potential causes for
changes, as well as for changes in hydrological regimes across Eur
Positive trends were found in the winter months in most catchmen
marked shift towards negative trends was observed in April, gradu
spreading across Europe to reach a maximum extent in August. Lo
have decreased in most regions where the lowest mean monthly f
occurs in summer, but vary for catchments which have flow minima
winter and secondary low flows in summer. The study largely confi
findings from national and regional scale trend analyses, but clearl
to these by confirming that these tendencies are part of coherent
of change, which cover a much larger region. The broad, continent
patterns of change are mostly congruent with the hydrological res
expected from future climatic changes, as projected by climate mo
patterns observed could hence provide a valuable benchmark for a

of different studies and model simulations.

▣ [Final Revised Paper](#) (PDF, 2362 KB) ▣ [Discussion Paper](#) (HESSD)

Citation: Stahl, K., Hisdal, H., Hannaford, J., Tallaksen, L. M., van Lanen, H. A. J., Sauquet, E., Demuth, S., Fendekova, M., and Jö Streamflow trends in Europe: evidence from a dataset of near-natural catchments, *Hydrol. Earth Syst. Sci.*, 14, 2367-2382, doi:10.5194/h 2367-2010, 2010. ▣ [Bibtex](#) ▣ [EndNote](#) ▣ [Reference Manager](#) ▣