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Using recently developed global data sets for hydrological predictions

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Abstract The HYPE hydrological model was used for multi-basin applications with model input derived from global databases compiled using the World Hydrological Input Set-up Tool (WHIST). The model was applied to the La Plata Basin (3.2 million km^2) in South America and to Europe (7 million km^2). Water balance was modelled reasonably well, with volume errors at the gauging stations in Europe being generally <10%, whilst there were larger discrepancies in La Plata Basin. The median Nash-Sutcliffe model efficiency (NSE) was 0.27 for Europe and <0 for La Plata Basin. A simple sensitivity study shows that, for Northern Europe, the model results were most sensitive to meteorological forcing data and land cover. The results indicate that global databases can be useful for hydrological predictions in data sparse regions, although further studies are required to better distinguish between specific sources of errors and possibilities for improvements of both databases and models.

Key words hydrological modelling; predictions in ungauged basins; sensitivity analysis; global databases