Learning from stakeholders in Europe, the USA, and Australia to improve drought monitoring and early warning

Kerstin Stahl (1), Kevin Collins (2), Jamie Hannaford (3), Cody Knutson (4), Mark Svoboda (4), Nicole Wall (4), Lucy Barker (3), Erik Tijdeman (1), Mike Acreman (3), Sophie Bachmair (1), Ian Overton (5), and Neville Crossman (6)

(1) University of Freiburg, Freiburg, Germany (kerstin.stahl@hydrology.uni-freiburg.de), (2) The Open University, Milton Keynes, UK, (3) Centre for Ecology and Hydrology, Wallingford, UK, (4) National Drought Mitigation Center, University of Nebraska, Lincoln, USA, (5) Water Research Australia Ltd, Adelaide, Australia, (6) University of Adelaide, Adelaide, Australia

Drought risk management may reduce potential threats to freshwater security across the globe. Drought monitoring and early warning is an important part of risk management, but most current efforts focus largely on indicators from meteorology and hydrology. A survey of existing monitoring and early warning systems globally suggests that drought impacts on environment and society are also being monitored, but the information is not used quantitatively. Co-design and transdisciplinary approaches are crucial to improve this missing link between drought indices and drought impacts. The Belmont Forum project DrIVER (Drought impacts: Vulnerability thresholds in monitoring and early-warning research) carried out a number of stakeholder workshops in North America, Europe and Australia to elaborate on options for such improvements. A first round of workshops explored current drought management practices among a very diverse range of stakeholders, and their expectations from monitoring and early warning systems (particularly regarding impact characterization). The workshops revealed some disconnects between the indices used in the public early warning systems and those used by local decision-makers, e.g. to trigger drought measures. Follow-up workshops then explored how the links between information at these different scales can be bridged and applied. Among the pathways forward stakeholders preferred historical analogues over statistical models of impact risk. Differences in water use and water governance in the three regions also suggest that different approaches are needed. These concern in particular the integration with existing local systems, different variables and impact types and different administrative scales. This contribution draws on the lessons learned from the transdisciplinary interactions in DrIVER, to enhance the usability of drought monitoring and early-warning systems and other risk management strategies.