



Using and understanding robustness metrics: Guidance for decision-makers

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The combination of climatic, technological, economic and socio-political changes has led to the realisation that management of water resources systems requires the consideration of multiple plausible futures and deep uncertainty. Many robustness metrics have been used for decision analysis under deep uncertainty, however there has been little discussion of why the different metrics can result in different rankings of decision alternatives. In order to provide guidance to decision-makers, we have created a framework to improve the understanding of how robustness metrics are calculated, when they should be used and why they sometimes give different results. This framework (i) categorises the suitability of metrics to the decision-maker based on a number of factors including the decision-context and the decision-maker's preferences, (ii) assists in understanding how "stable" the ranking of decision alternatives are likely to be when considering different metrics, and (iii) improves the understanding of the influence that the inputs to the robustness metrics have. The framework is tested and confirmed on a variety of water resources management case studies including water supply augmentation in Adelaide, Australia, the operation of a multipurpose regulated lake in Italy, and flood protection for a hypothetical river based on a reach of the river Rhine in the Netherlands.