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VALUE: a framework to validate downscaling approaches for climate change studies

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VALUE is an open European network to validate and compare downscaling methods for climate change research. VALUE aims to foster collaboration and knowledge exchange between climatologists, impact modellers, statisticians, and stakeholders to establish an interdisciplinary downscaling community. A key deliverable of VALUE is the development of a systematic validation framework to enable the assessment and comparison of both dynamical and statistical downscaling methods. In this presentation, we present the key ingredients of this framework and first validation results. VALUE's main approach to validation is user-focused: starting from a specific user problem, a validation tree guides the selection of relevant validation indices and performance measures. Several experiments have been designed to isolate specific points in the downscaling procedure where problems may occur: what is the isolated downscaling skill? How do statistical and dynamical methods compare? How do methods perform at different spatial scales? Do methods fail in representing regional climate change? How is the overall representation of regional climate, including errors inherited from global climate models? In addition to the framework itself, we present results of the first experiment: a comparison of different statistical downscaling and bias correction methods based on "perfect" predictors and "perfect" boundary conditions respectively.