



The good, the bad or the ugly? Under what conditions can we trust our models for impact studies?

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In climate change impact studies, hydrological models are applied in climate conditions that may differ, sometimes dramatically, from present climate. This represents a challenge that requires some caution. This challenge lies in the fact that, while we are able to verify the performance of our models on current data, the performance in future conditions is impossible to verify. Given that model preparation (parameters calibration, processes represented in the model) is highly dependent on our knowledge on the current characteristics, potential deviations of discharge simulations may indeed occur.

Trying to analyse such deviations and preventing them from occurring (i.e. warranting model robustness) is among the scientific questions of the Hydrology research group of Irstea. Through the application of (generalized) split sample tests, multi-model comparisons and modellers' workshop, the group developed an expertise in the evaluation of hydrological models robustness. In this presentation, we will illustrate our understanding of the diagnosis of models robustness deficiencies and the methods that can be implemented to tackle these issues through case studies from our past works. We will try to propose the prerequisites that seem necessary (but often not sufficient) to make a model as good as possible for applications in non-stationary conditions.