



## **Response of the global water cycle to anthropogenic forcings:**

### **What did we learn from the IPCC AR4 simulations ?**

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The hydrological response to the anthropogenic climate change is for many reasons much more difficult to predict than that of temperature. Beyond the unknowns related to the greenhouse gas emission scenarios, that mainly modulate the magnitude of the simulated anomalies, the global hydrological projections remain highly model-dependent. In some cases, it is the very sign of the large-scale hydrological impacts that remains unknown. Uncertainties are however unevenly distributed. They are strong as far as tropical precipitation is concerned, generally weaker in the mid- and high latitudes, particularly over Europe where most models agree to predict a significant summer drying in the south and an increase in winter precipitation in the north. Globally speaking, hydrological contrasts are likely to strengthen in both space and time. Nevertheless, many open questions remain about the very nature and regional distribution of precipitation changes. The aim of the present study is to explore the main sources of uncertainties in the IPCC AR4 climate scenarios and, from this analysis, to derive a meaningful strategy to better constrain the models' hydrological response.