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Uncertainties in hydrological extremes projections and its effects on decision-making processes in an Amazonian sub-basin.

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Uncertainties in Climate Change projections are affected by irreducible uncertainties due to knowledge's limitations, chaotic nature of climate system and human decision-making process. Such uncertainties affect the impact studies, complicating the decision-making process aimed at mitigation and adaptation. However, these uncertainties allow the possibility to develop exploratory analyses on system's vulnerability to different sceneries. Through these kinds of analyses it is possible to identify critical issues, which must be deeper studied.
For this study we used several future's projections from General Circulation Models to feed a Hydrological Model, applied to the Amazonian sub-basin of Ji-Paraná. Hydrological Model integrations are performed for present historical time (1970-1990) and for future period (2010-2100). Extreme values analyses are performed to each simulated time series and results are compared with extremes events in present time.
A simple approach to identify potential vulnerabilities consists of evaluating the hydrologic system response to climate variability and extreme events observed in the past, comparing them with the conditions projected for the future. Thus it is possible to identify critical issues that need attention and more detailed studies. For the goal of this work, we used socio-economic data from Brazilian Institute of Geography and Statistics, the Operator of the National Electric System, the Brazilian National Water Agency and scientific and press published information. This information is used to characterize impacts associated to extremes hydrological events in the basin during the present historical time and to evaluate potential impacts in the future face to the different hydrological projections. Results show inter-model variability results in a broad dispersion on projected extreme's values. The impact of such dispersion is differentiated for different aspects of socio-economic and natural systems and must be carefully addressed in order to help in decision-making processes.