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Stochastic characteristics of flood impacts for agricultural insurance practices

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During the last decades, the rising demand for crops for human consumption and industrial processes has led to a growth of investments and search for innovative solutions across the field of agriculture. However, one major risk that both investors and low-income farmers encounter worldwide is the impact of extreme weather events on their crop yield. The risk caused by extreme weather is an inhibitor of growth of agriculture and, apparently, agricultural insurance is strategically important for dealing with that risk. In particular, crop-yield insurance is purchased by agricultural producers, and in many cases is subsidized by governments, to protect them against the loss of their crops due to natural disasters, such as extreme flood events. In this context, the main subject of this research is to apply a stochastic approach of extremes for evaluating the impact of flood risk on agricultural insurance practices. We investigate stochastic aspects of extreme flows such as the right tail of the distribution of extremes and the existence of clustering mechanisms. For this purpose, we analyze daily flow series from the CAMELS dataset. Furthermore, we review current insurance practices in the agriculture domain in Greece and inspect the underlying stochastic assumptions, while evaluating changes in the estimated flood risk in the case that these assumptions are not valid.