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Decision-making under uncertainty: results from an experiment conducted at EGU 2012

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Do probabilistic forecasts lead to better decisions? At the EGU General Assembly 2012, we conducted a laboratory-style experiment to address this question. Several cases of flood forecasts and a choice of actions to take were presented as part of a game to participants, who acted as decision makers. Participants were prompted to make decisions when forecasts were provided with and without uncertainty information. They had to decide whether to open or not a gate which was the inlet of a retention basin designed to protect a town. The rules were such that: if they decided to open the gate, the retention basin was flooded and the farmers in this basin demanded a compensation for flooding their land; if they decided not to open the gate and a flood occurred on the river, the town was flooded and they had to pay a fine to the town. Participants were encouraged to keep note of their individual decisions in a worksheet. About 100 worksheets were collected at the end of the game and the results of their evaluation are presented here. In general, they show that decisions are based on a combination of what is displayed by the expected (forecast) value and what is given by the uncertainty information. In the absence of uncertainty information, decision makers are compelled towards a more risk-averse attitude. Besides, more money was lost by a large majority of participants when they had to make decisions without uncertainty information. Limitations of the experiment setting are discussed, as well as the importance of the development of training tools to increase effectiveness in the use of probabilistic predictions to support decisions under uncertainty.