



## **Hazard criteria for vehicles and people in floodwaters**

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Floods are the natural hazard affecting the highest number of people both in developed and in developing countries. Although the safety of people is the primary objective for flood risk management purposes, hazard criteria for people are often not included in flood maps and in risk mitigation plans. This is also due to a sparse research on the subject and to the difficulties in identifying precise relationships between flood characteristics and people instability. Usually, different hazard zones are classified according to the product number depth•velocity. The curves so defined attempt to give an interpretation to the large scatter observed in dimensional pairs of water depth and velocity, in which instability occurs in flume experiments. It is widely recognized that most of casualties during a flood is a consequence of inappropriate high-risk behaviours, like driving or walking in floodwaters. In this work, the two main causes of fatalities, are investigated. A dimensionless instability criterion for people under water flow, which is a function both of the physical characteristics of the human subject and of the flood characteristics, is proposed. Since the criterion is dimensionless, it allows comparing the instability conditions for people with those for vehicles, providing a decisive support for people education and risk management.