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Significance of 'high probability/low damage' versus 'low probability/high damage' flood events

B. Merz, A. Thieken

GeoForschungsZentrum Potsdam, Telegrafenberg, 14473 Potsdam, Germany
(bmerz@gfz-potsdam.de)

The need for efficient use of our limited resources fosters the application of cost-benefit analyses in flood mitigation. Flood defense measures reduce the future damage and are considered as benefit in cost-benefit studies. Traditionally, the benefit is quantified by the expected damage. This presentation analyses the contribution of extreme floods (high probability/low damage) versus the contribution of frequent floods (low probability/high damage) to the expected damage. For several case studies, e.g. actual flood situation in flood-prone communities, it is shown that the expected damage is dominated by frequent events. Extreme events play a minor role, even though they cause high damages. Using typical values for flood plain morphology, distribution of assets and vulnerability, etc, it is shown that this also holds for the general case. This result is compared to the significance of extreme events in the public perception. It is found that extreme events are much more important in the societal view than it is expressed by the expected damage. We conclude that the expected damage is no intelligent risk indicator since it is not in agreement with societal priorities.