

Closing the gap between the hazard and the risk

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Three gaps in current practice

Where are the main challenges in risk management for natural hazards?

1. The gap between the hazard and the risk,
2. between the risk assessments and the choice of action, and
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Thesis

Greater use of formal methods for uncertainty & risk assessment, and decision making, can reduce the size of these gaps (but not, of course, close them completely).

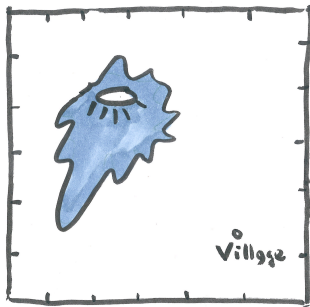
The hazard and the risk

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Event footprint map

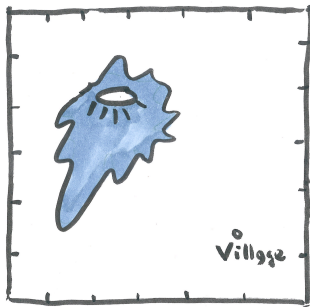


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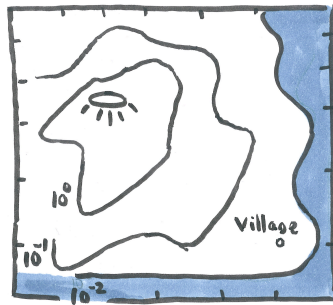
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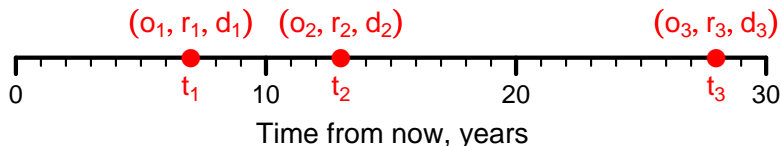
Probabilistic map, 30 years



Shows the probability of inundation, to occur at any time in a specified interval, such as thirty years.

Hazard events and hazard outcomes

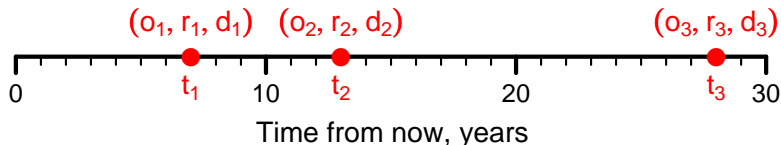
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where (o_i, r_i, d_i) are the orientation, rate, and duration of the i th event, which occurs at time t_i . Assigning a probability to this outcome, and computing its loss, are both extremely challenging.

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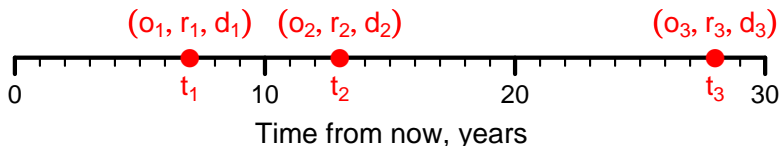
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1. The loss from the hazard outcome can be assessed from the losses of the individual events, and
2. Events of type k follow independent homogeneous Poisson processes, each one summarised in terms of an *arrival rate*, λ_k .