What is the 'Reasonable Worst Case'?

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Introduction

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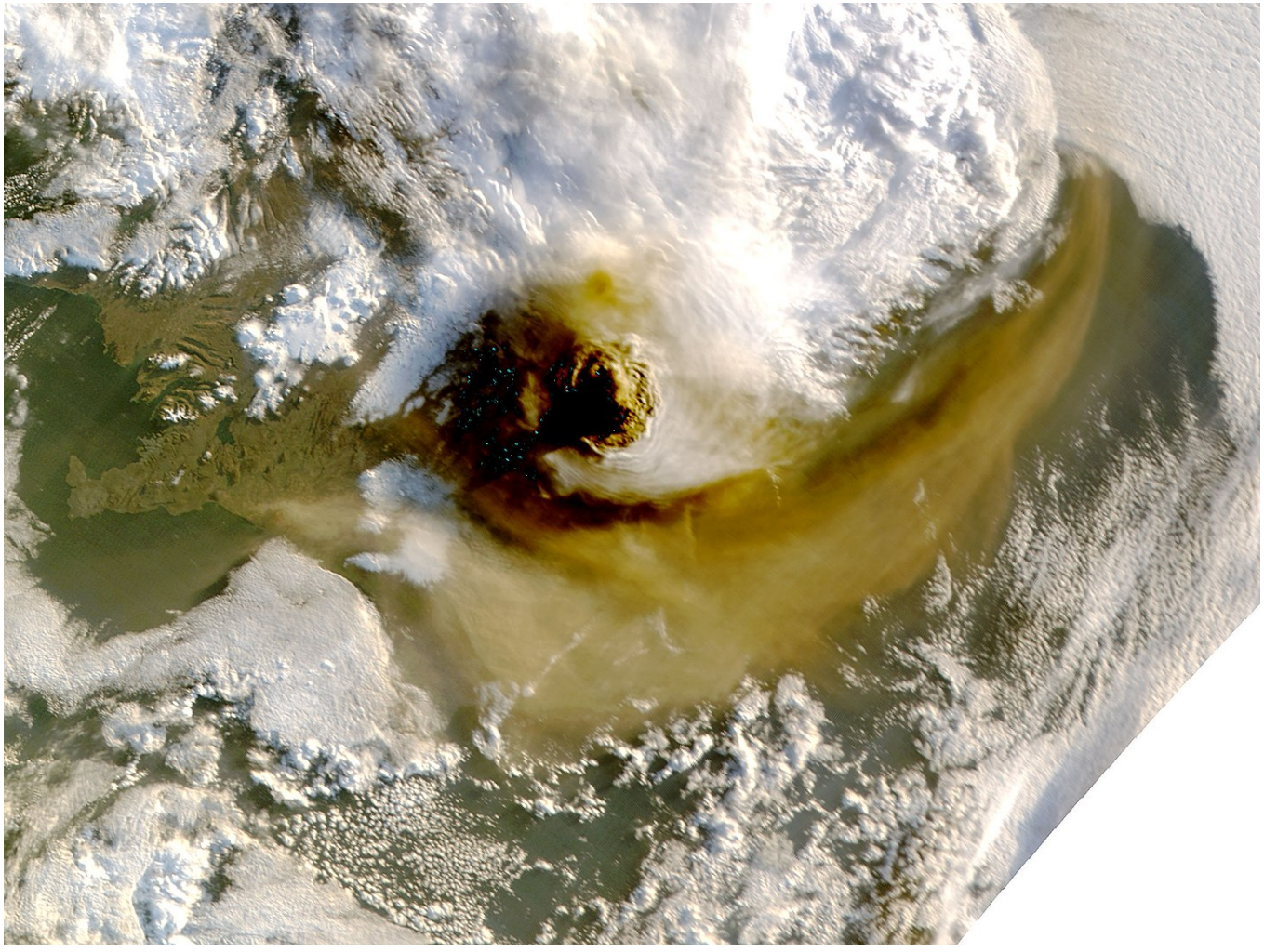
- The idea of a Reasonable Worst Case (RWC) is to select an examplar event for the hazard class, primarily to allow easier comparison across hazard classes (although there are other ways to achieve this).
- One critical feature, which is applicable across all hazard classes, is a notion of event size, although the precise definition often depends partly on what can be measured.
- Above a (usually low) threshold, frequency of hazard events diminishes with size (thank goodness). A good starting-point for a RWC is the question – What size event?

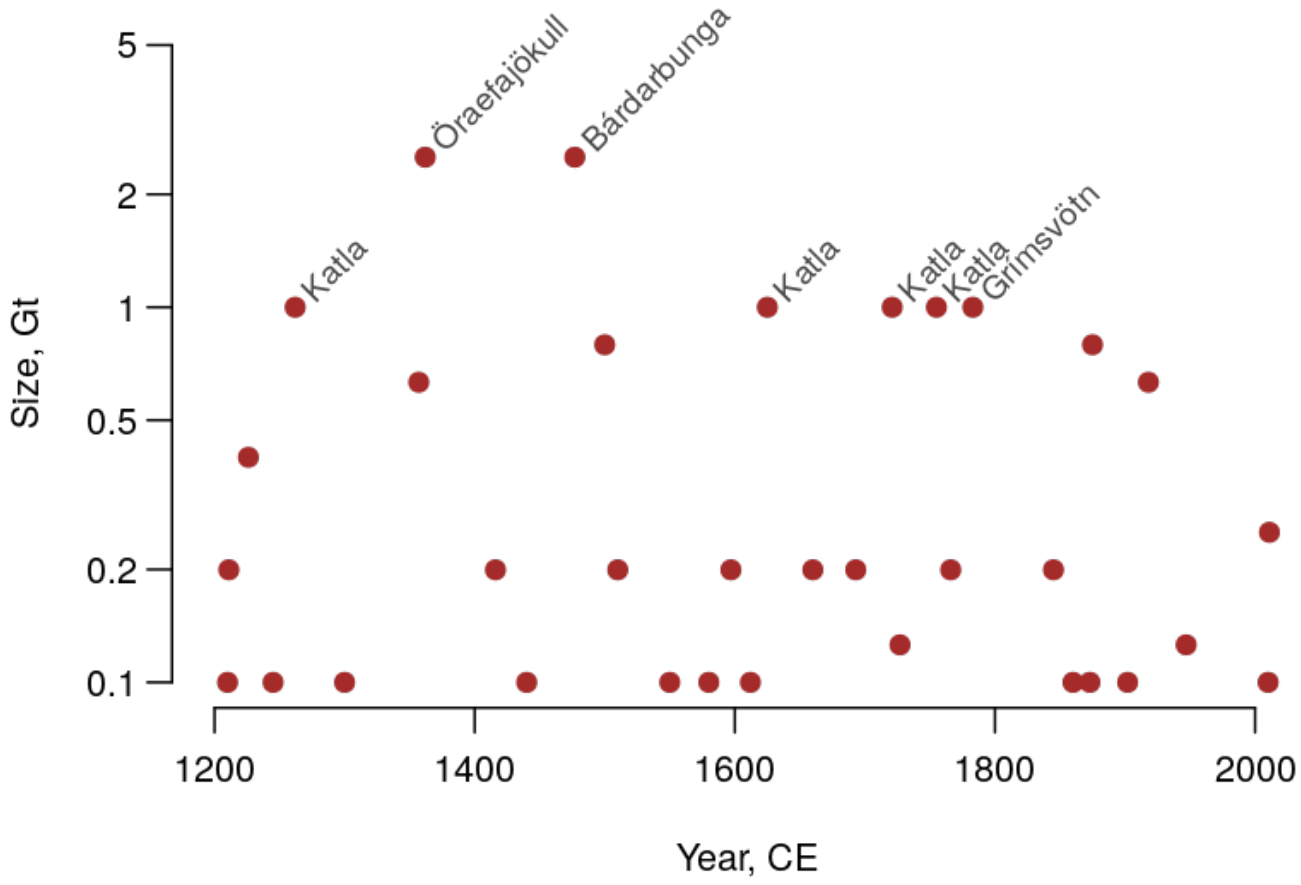
Explosive eruptions in Iceland



Source: https://en.wikipedia.org/wiki/2011_eruption_of_Grimsvotn

Explosive eruptions in Iceland

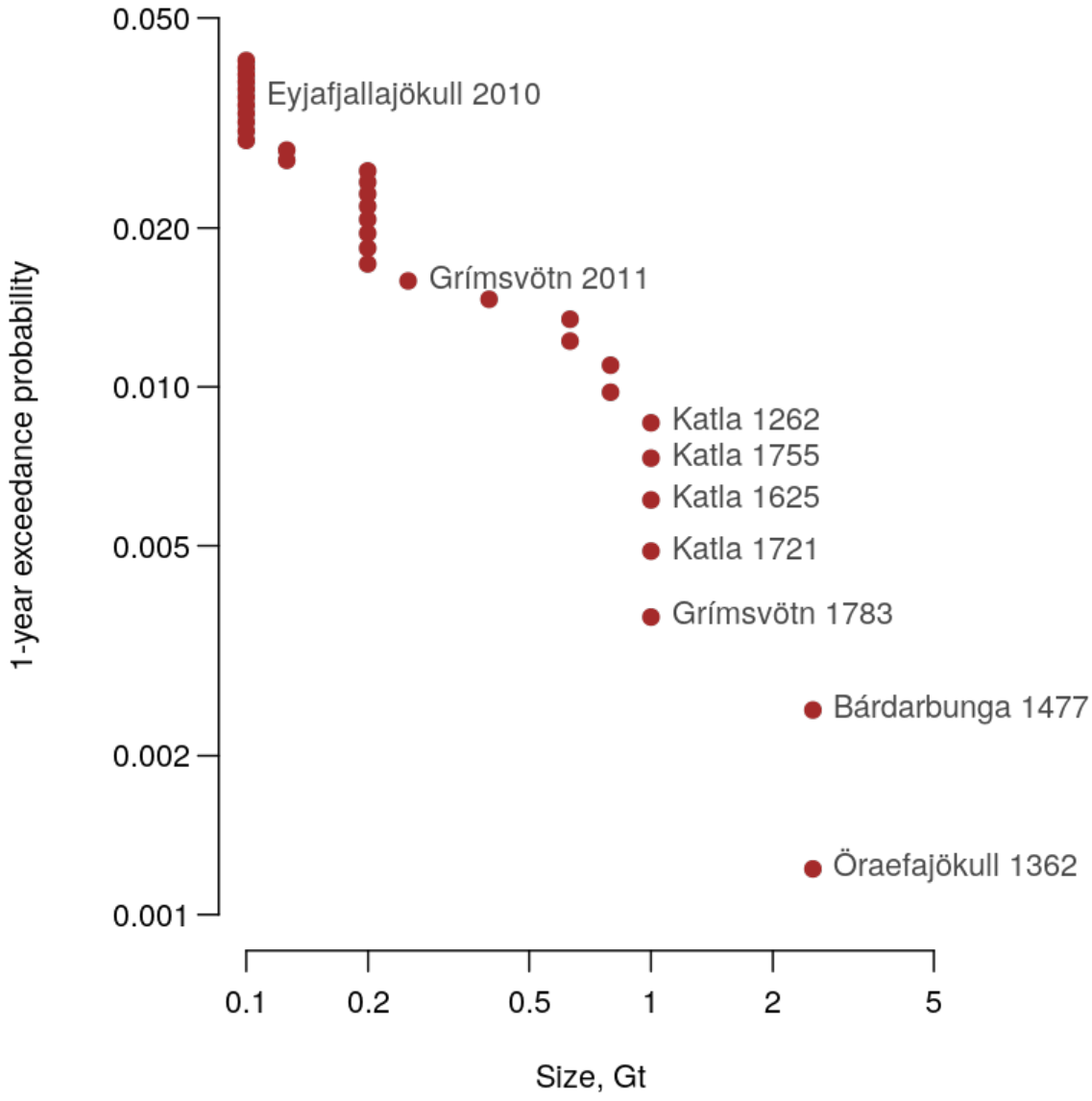
Large (at least 0.1 Gt) explosive eruptions in Iceland



Source: LaMEVE database, dated 07/06/2018. Eyjafjallajökull (2010) was 0.1 Gt; Grímsvötn (2011) was 0.25 Gt.

Explosive eruptions in Iceland

1-year Exceedance Probability curve



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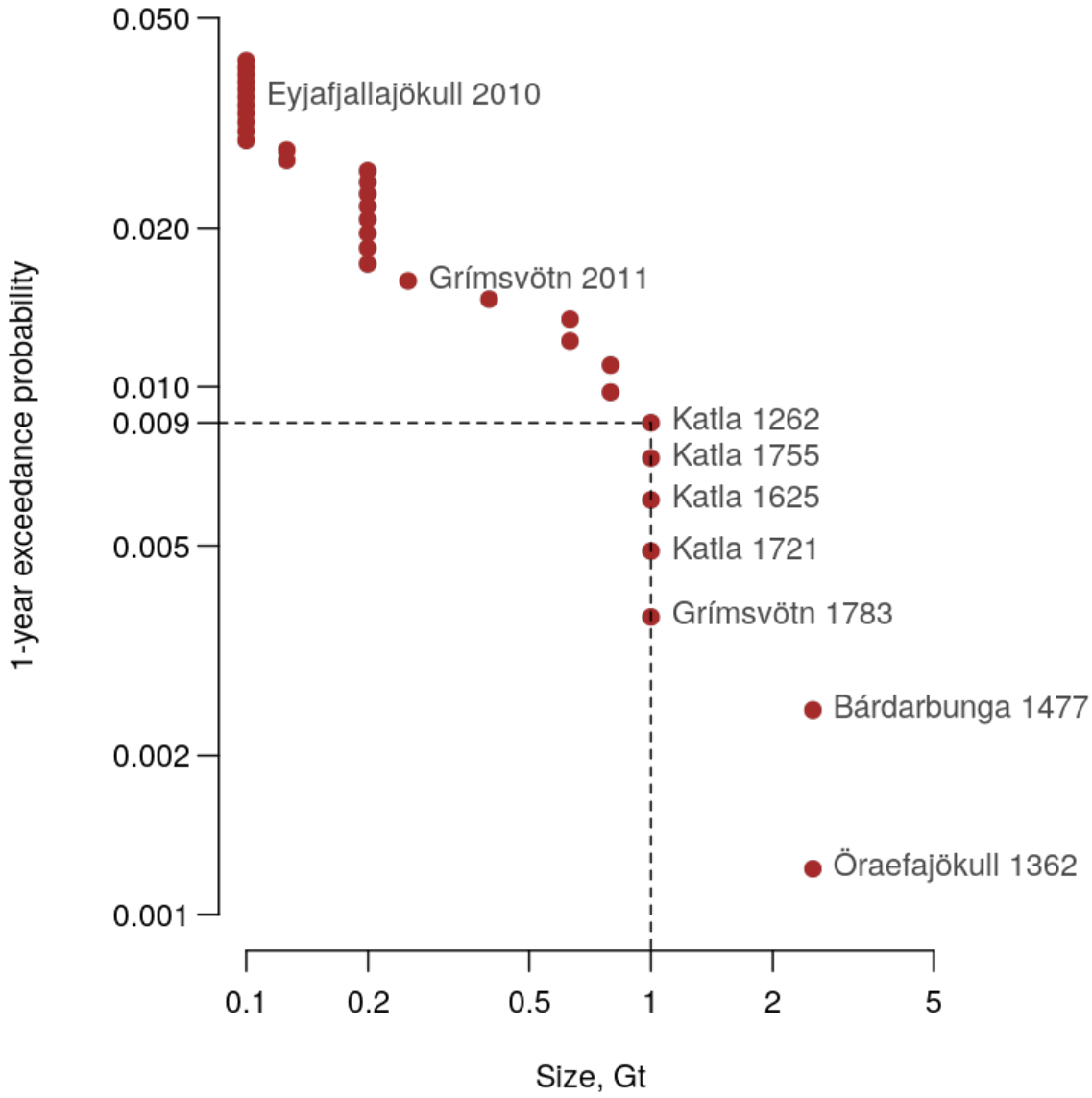

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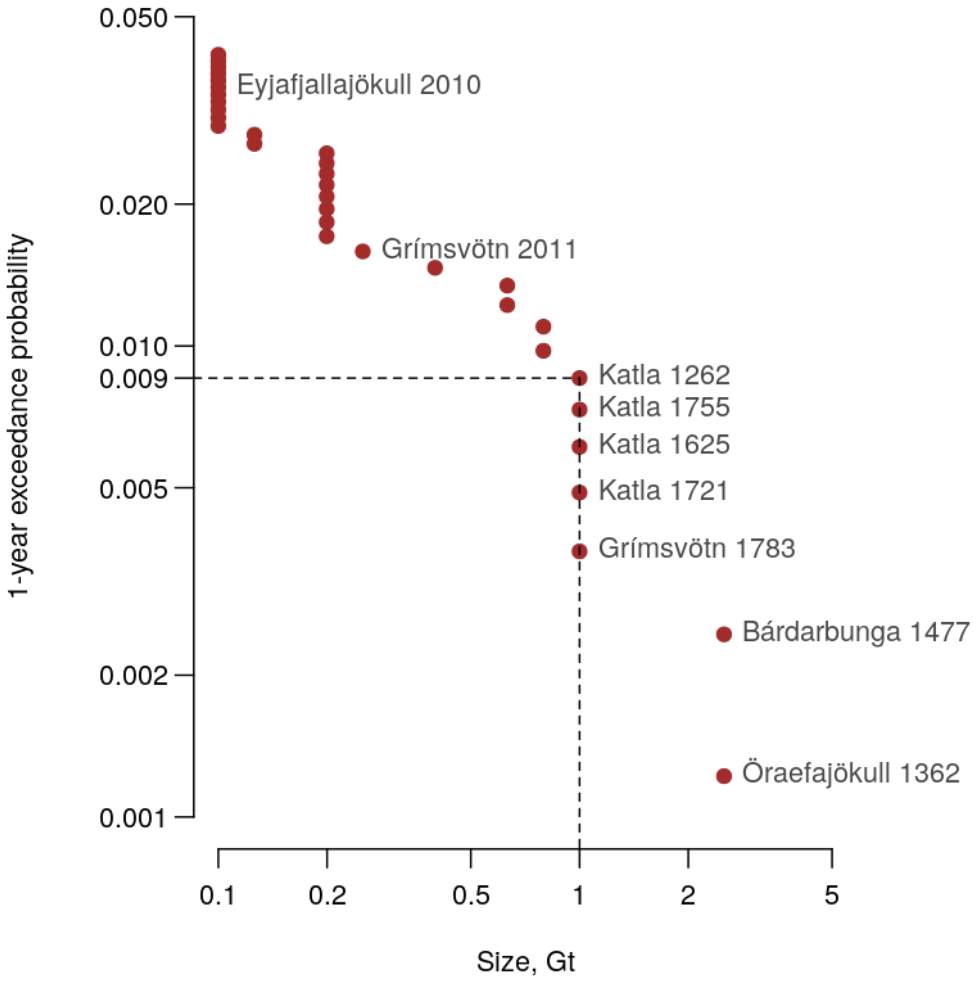

1-year EP

The probability of *at least* one eruption *at least* as large as Grímsvötn (1783) in the next year is about 0.009, or 1-in-111.

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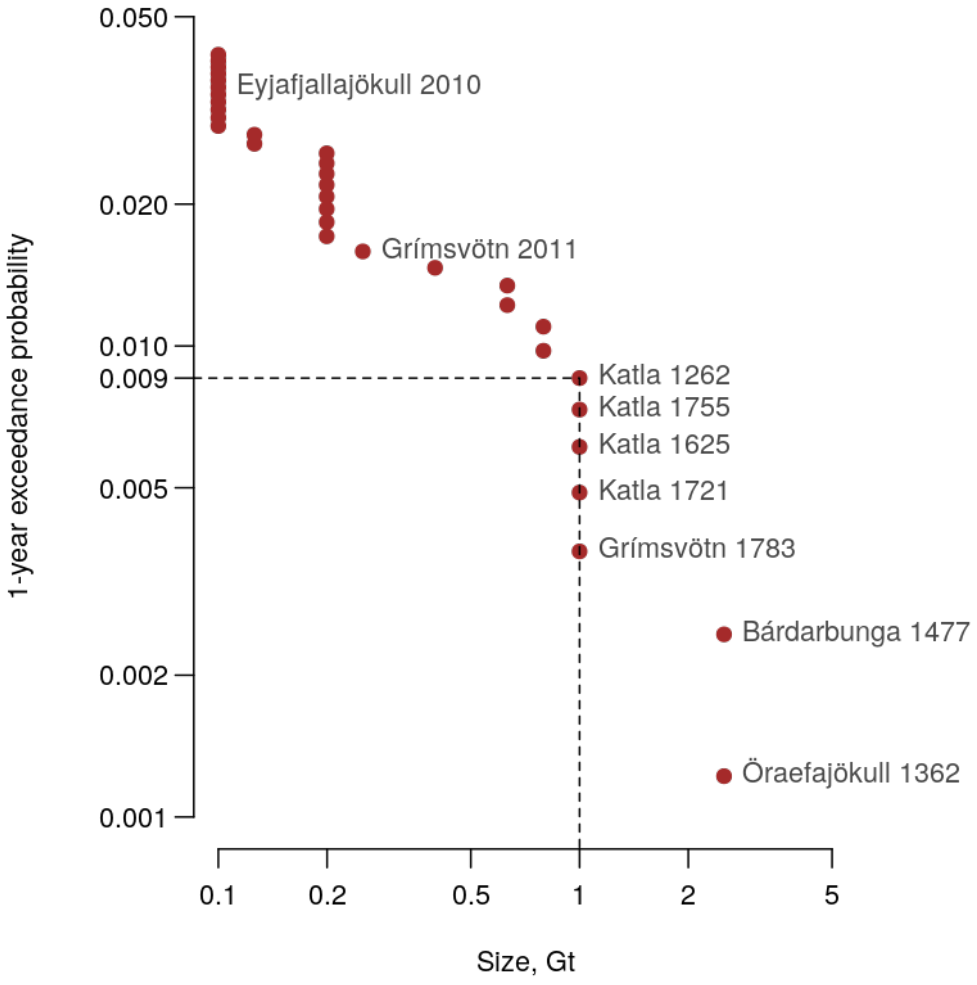

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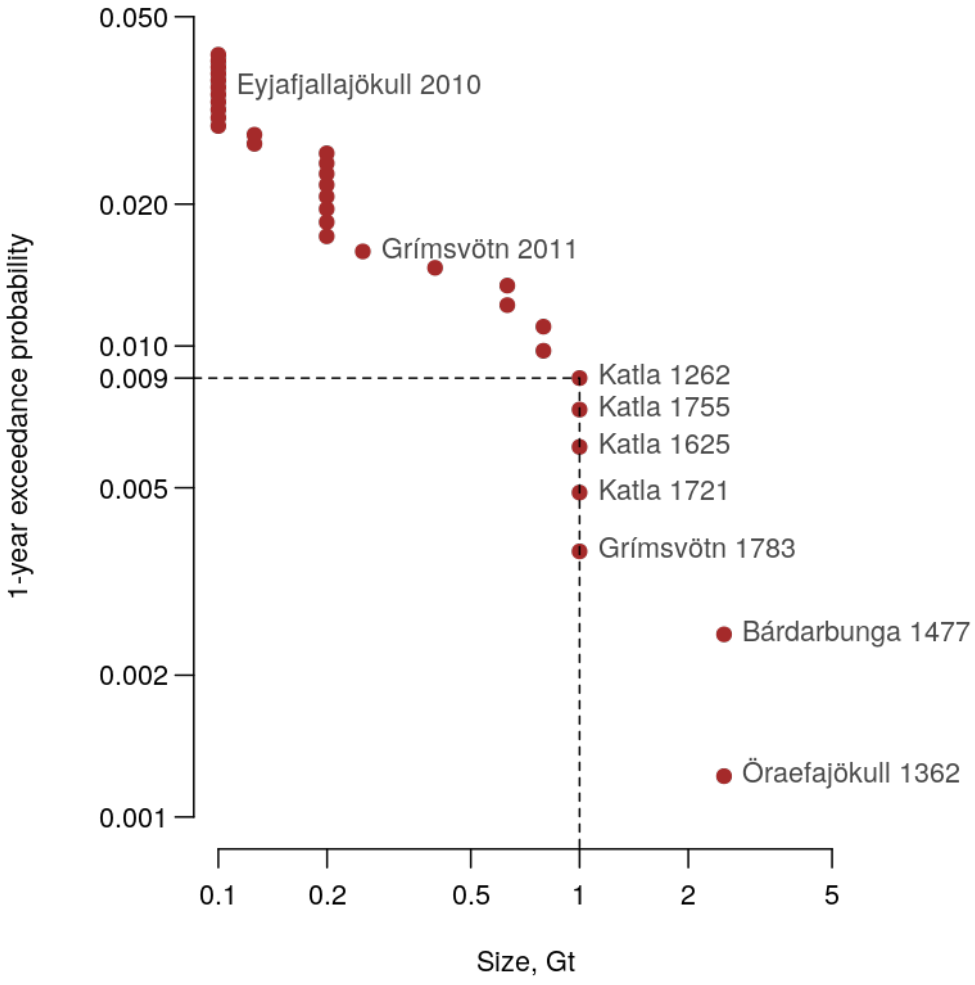

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EPs can be for any duration; 100-year EPs are common for infrastructure.

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     - *Likelihood* from the 1-year EP curve (see below)
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- If your RWC is the largest event in the last h years, then, under a mild stationarity condition, your 1-year EP is $1/(h+1) \approx 1/h$.