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Power-laws and snow avalanches

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ABSTRACT. This paper presents evidence of frequency-size power-laws in several groups of snow avalanche paths. Other natural hazards, such as earthquakes and forest fires, exhibit similar power-law relationships. In addition, an analysis of the response of one group of snow avalanche paths to storms through time demonstrates a power-law between the response of the system and the binned frequency of those responses. Our results, as well as our experience with these complex, non-linear systems, are consistent with self-organized criticality. The practical implication of this work is that the frequency-size relationship for small and medium sized avalanches may be useful for quantifying the risk of large snow avalanches within a group of avalanche paths.