

# Quantifying the risk associated with rockfalls in the Andes

November 14 2023

---



Mountain road in Chile. Credit: INRAE

High mountain regions often face a multitude of natural hazards, the

combined effects of which, known as "cascading hazards," can have serious consequences for infrastructure and urban areas.

However, there is a lack of tools to prevent and quantify these complex risks. That's why researchers across several countries have collaborated to develop an innovative way to calculate rockfall risk over large areas of very high mountains affected by high seismic activity. The major challenge of this work? Quantify these risks in a detailed and exhaustive manner.

This new method addresses this challenge in an innovative way, taking into account a wide range of exposed assets (people, dwellings, flowing vehicles, lifelines) and considers both the rockfall risk associated with earthquakes and the "common" rockfall risk resulting from erosion and local climatic conditions.

## **Earthquakes account for nearly 60% of the rockfall risk in the Andes**

For example, one of the major findings of this study is that nearly 60% of the total rockfall hazard in the Andean zone studied is attributable to seismic activity. It is, therefore, crucial to consider the rockfall risk when [large earthquakes](#) occur in this area.

This method has been successfully tested in the Andes Mountains in Chile, providing promising results. These results show that it is now possible to assess the risk of rockfalls in the mountains in a more comprehensive manner.

Experts can now identify which places are most at risk, such as villages and stretches of roads that are exposed. This advance represents an important step towards better prevention of rockfalls in [mountainous](#)

[areas](#), offering valuable tools to anticipate and reduce the consequences of these events on infrastructure and communities.

The work is [published](#) in the journal *Risk Analysis*.

**More information:** Manon Farvacque et al, Holistic rockfall risk assessment in high mountain areas affected by seismic activity: Application to the Uspallata valley, Central Andes, Chile, *Risk Analysis* (2023). [DOI: 10.1111/risa.14239](https://doi.org/10.1111/risa.14239)

Provided by INRAE—National Research Institute for Agriculture, Food and Environment

Citation: Quantifying the risk associated with rockfalls in the Andes (2023, November 14) retrieved 27 April 2024 from <https://phys.org/news/2023-11-quantifying-rockfalls-andes.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.