Assessing present and future multihazard at glacierised volcanoes

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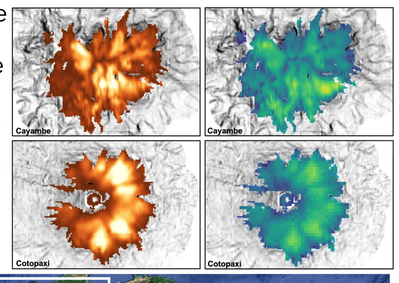
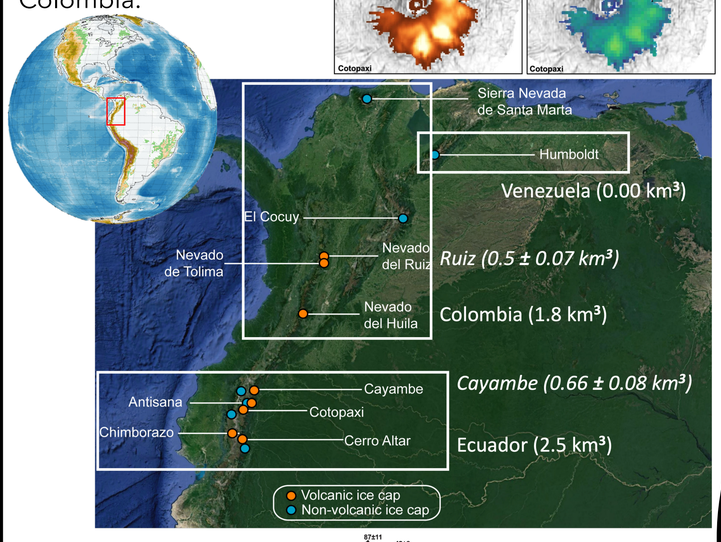
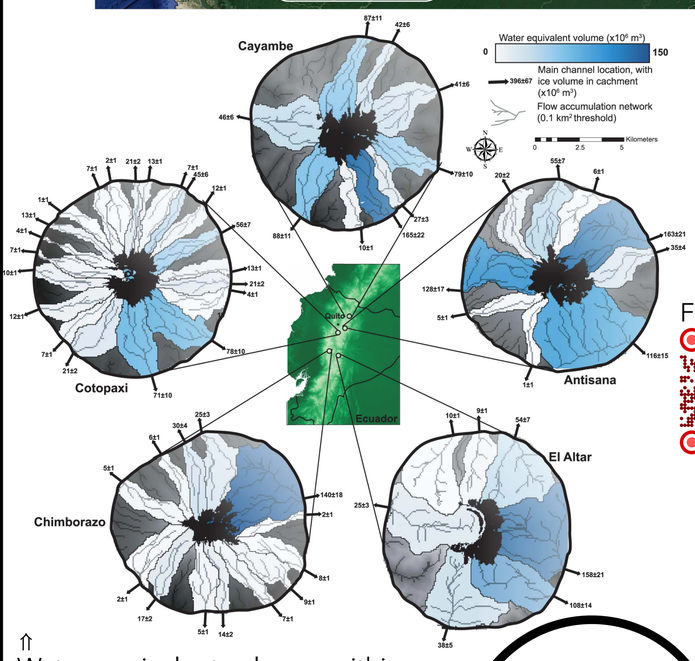
We develop a new remote sensing workflow to remotely map volcanic ice cap thicknesses and volumes. We evaluate this at all glacierised volcanoes in Ecuador and Colombia.



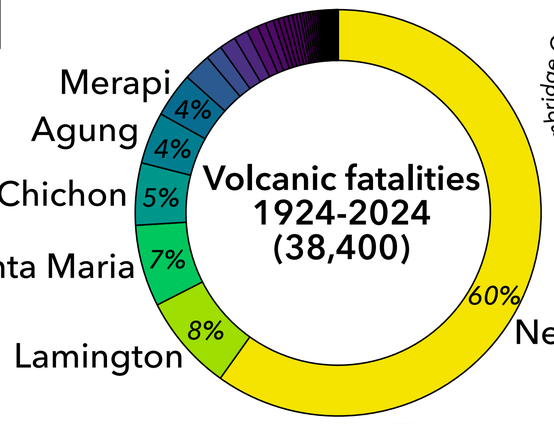


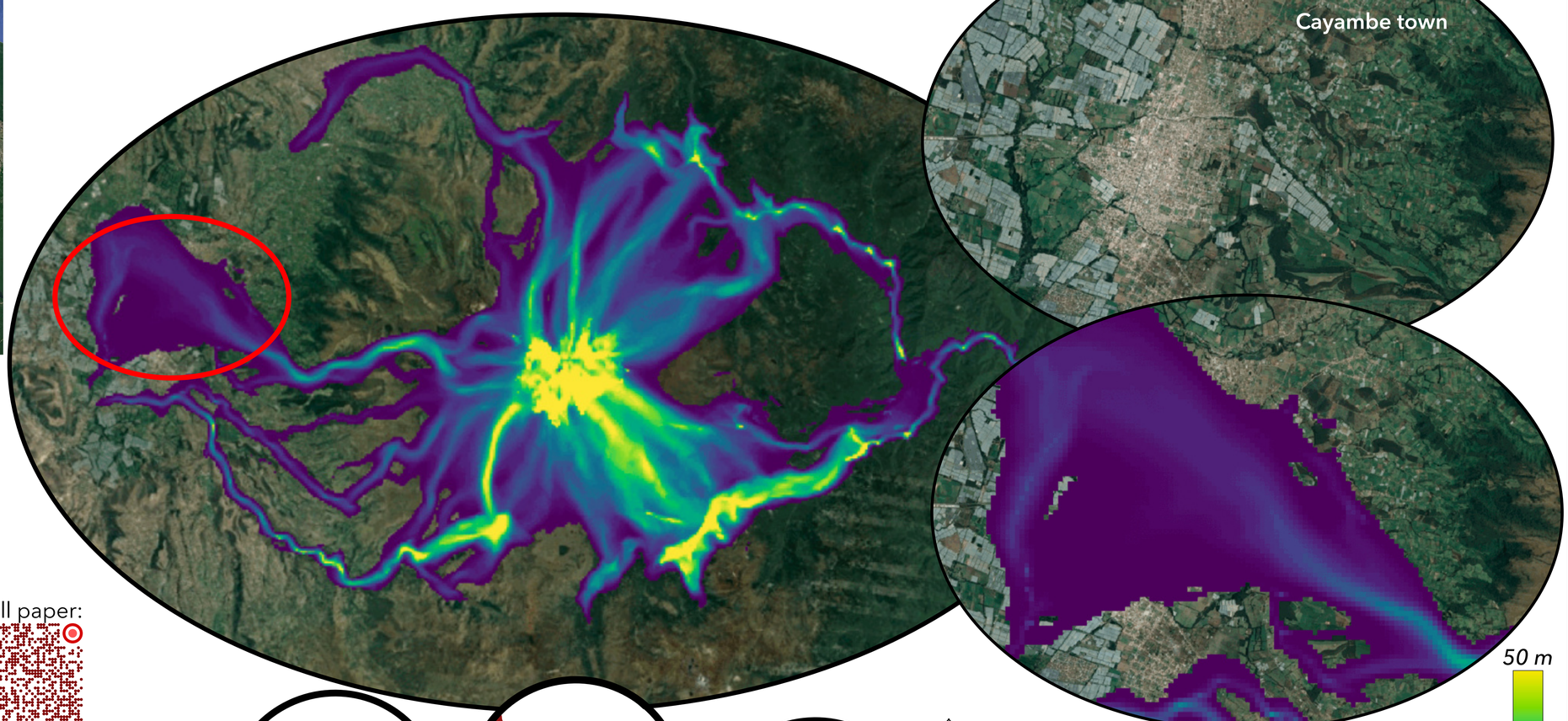


⇑ Water-equivalent volumes within different catchments draining the five remaining Ecuadorian volcanic ice caps. This provides information about the maximum primary lahar volume.

⇒Glacierised volcanoes account for the majority of volcanic deaths over the past century, with one single lahar killing more than all other volcanoes combined.
⇒Around 250 glacierised volcanoes are present around the world, with more than 160 million people living within 100 km of their summits.
⇒Populations in hazard-prone areas around glacierised volcanoes are increasing.
⇒Due to climatic warming, many volcanoes will deglaciate by 2100
⇒We have little information about present-day ice conditions in most cases

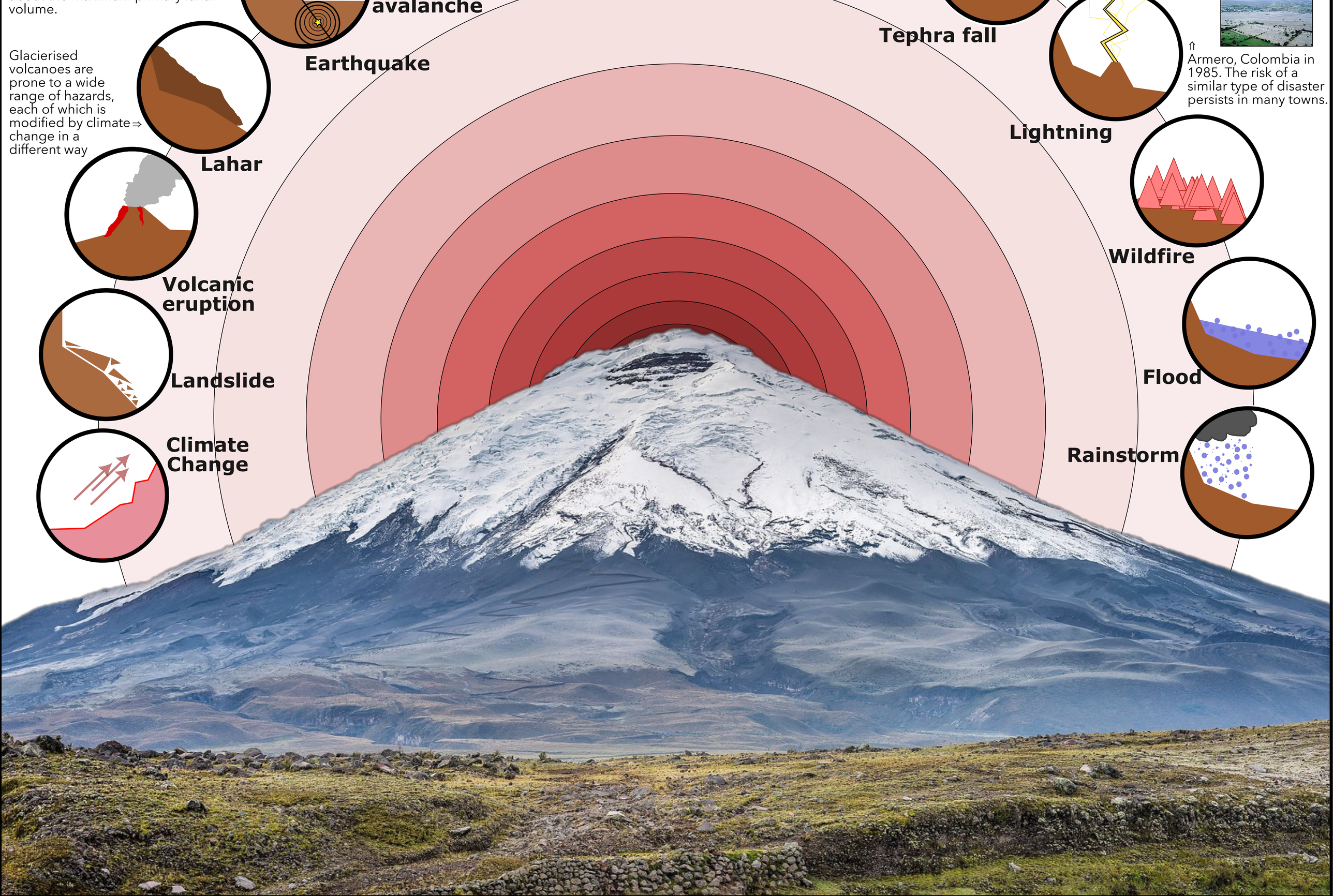
Q: Will deglaciation increase or decrease hazard and risk at glacierised volcanoes?
(i): We must develop better ice-thickness and volume maps for glacierised volcanoes.
(ii): We must evaluate both eruption- and non eruption-related hazards.





⇑ Prototype VolcFlow (granular flow model) lahar simulations for Cayambe. Here shown: Extreme melt endmember with 100% ice loss.

Full paper:



⇑ Armero, Colombia in 1985. The risk of a similar type of disaster persists in many towns.

Glacierised volcanoes are prone to a wide range of hazards, each of which is modified by climate⇒ change in a different way