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A national inventory of potential future lakes in the deglaciating cordilleras of Peru for integrative water and risk management

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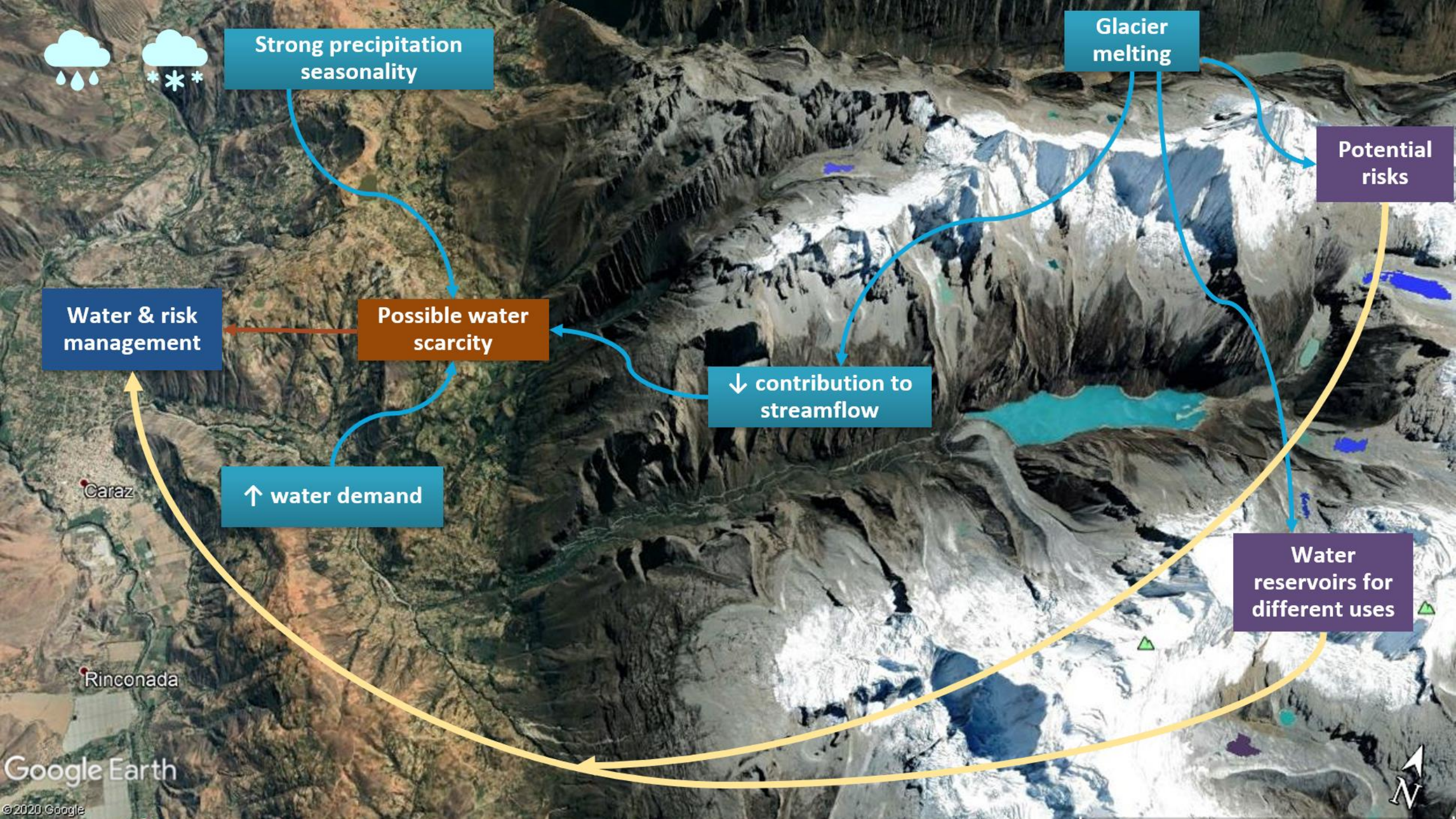
Strong precipitation seasonality
Glacier melting
Potential risks
Water & risk management
Possible water scarcity
↓ contribution to streamflow
↑ water demand
Water reservoirs for different uses
Caraz
Rinconada
Google Earth
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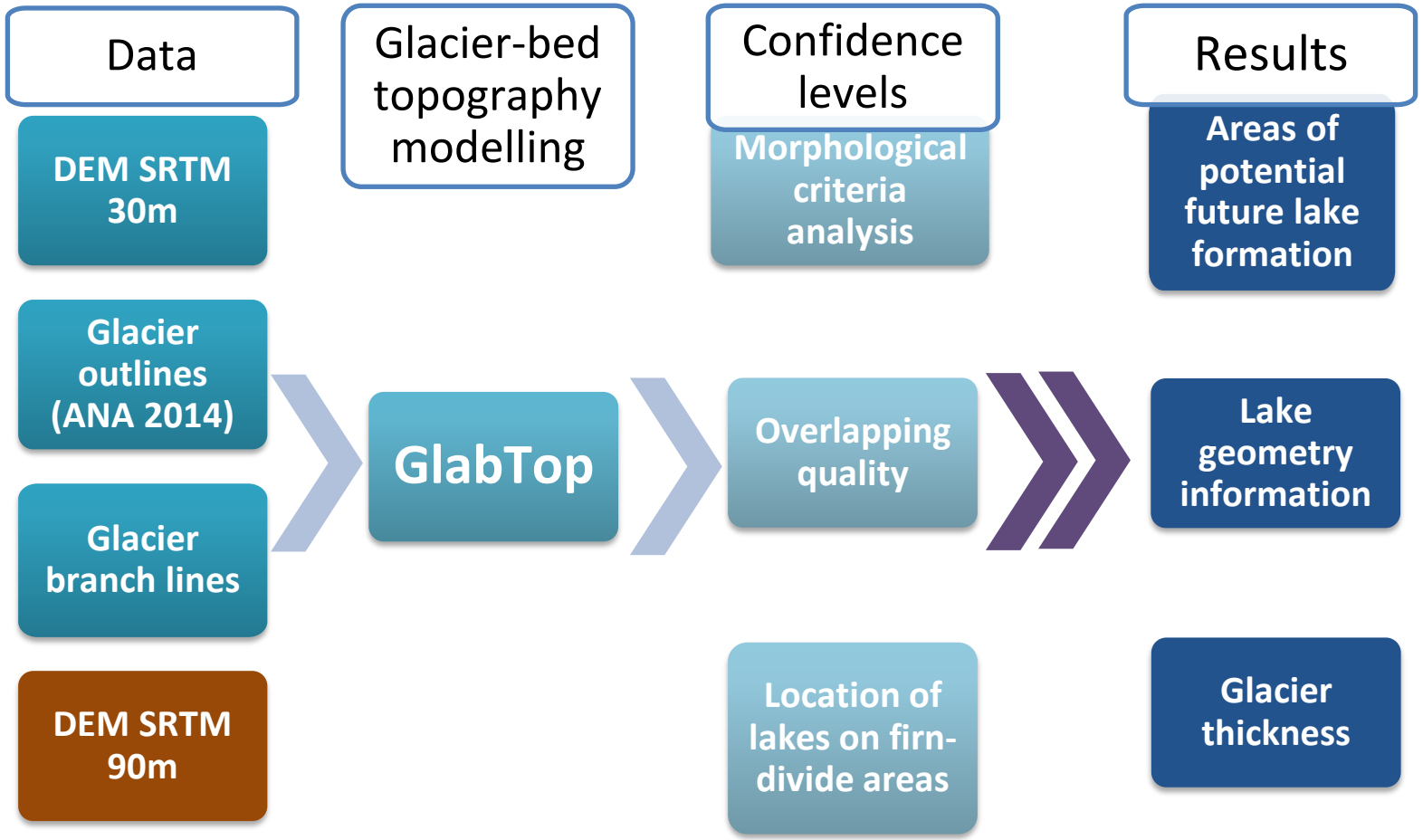
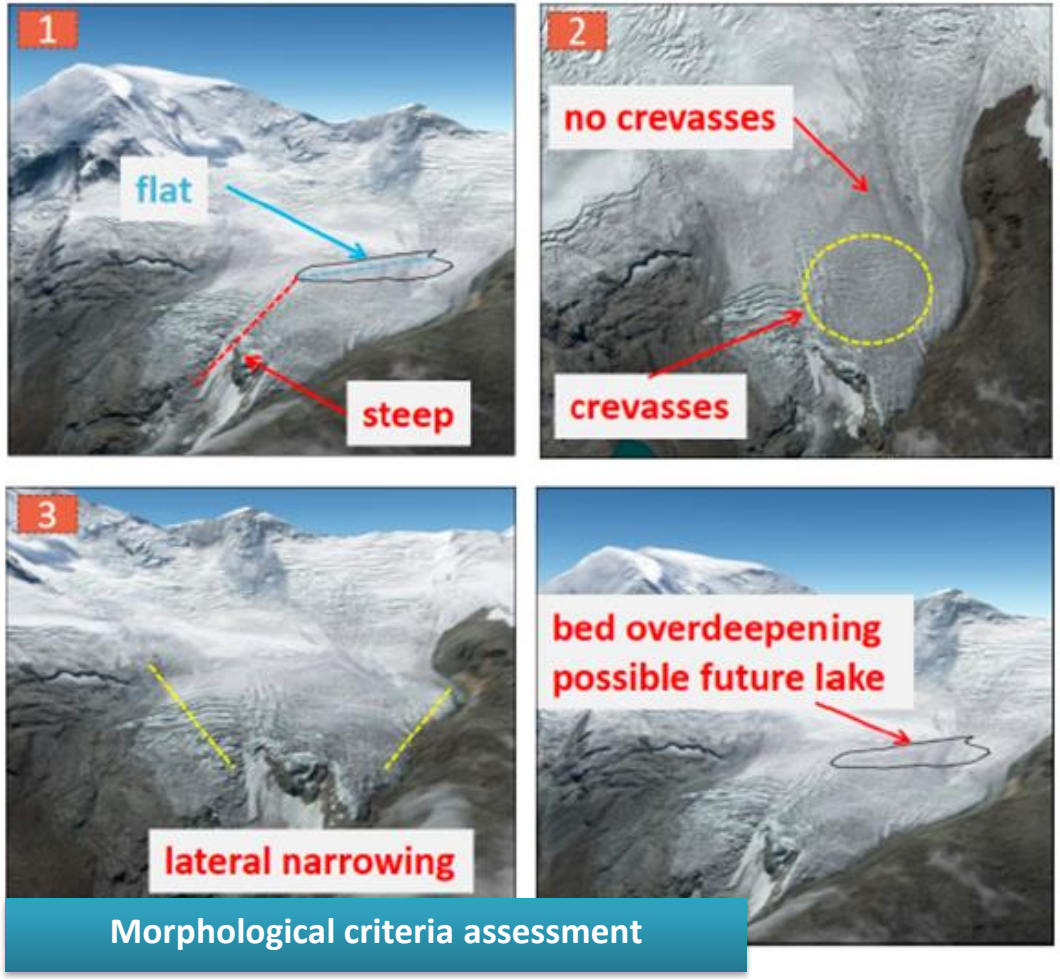
Methodology



Methodology

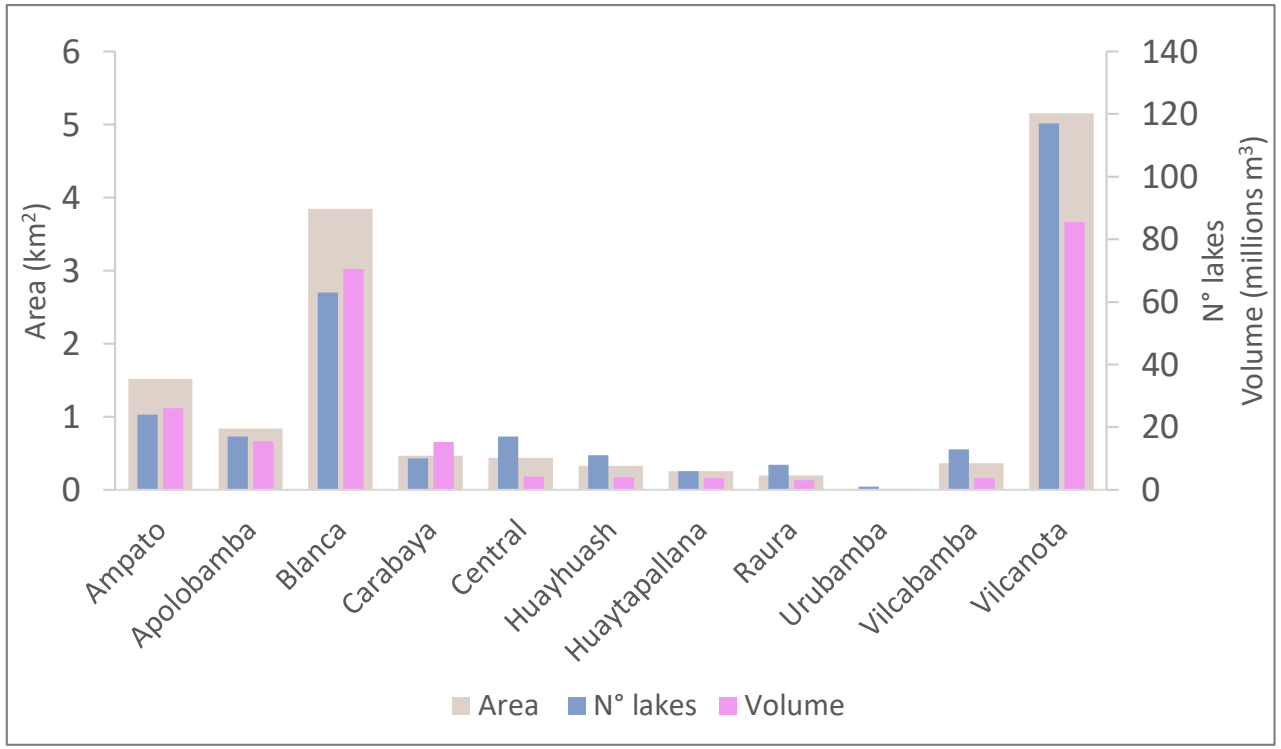


Morphological criteria assessment

High confidence in the simulation of two possible future lakes

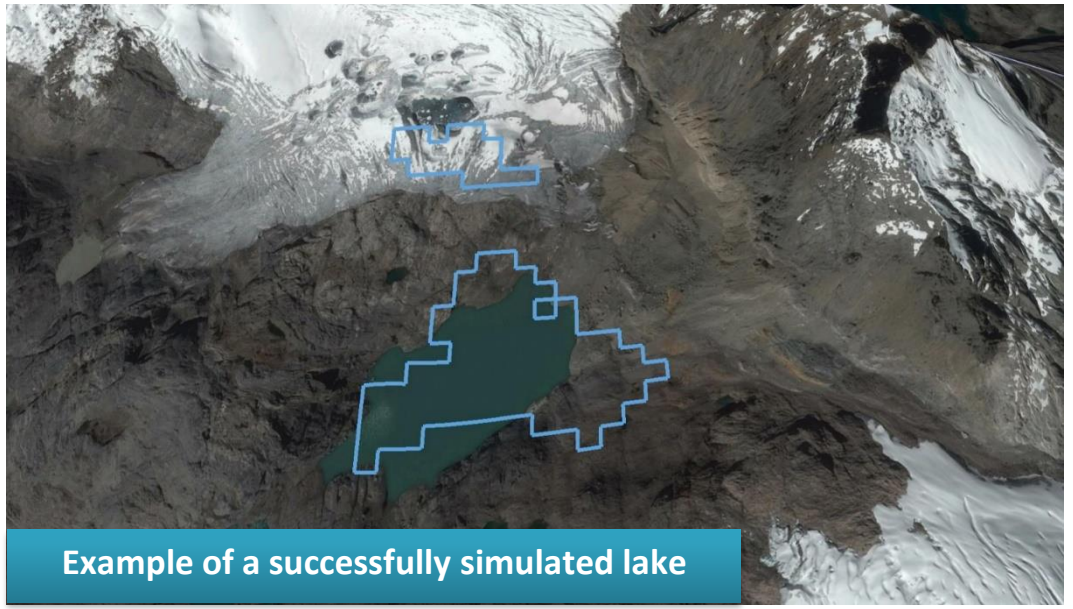
Source: Colonia D, Torres J, Haeberli W, Schauwecker S,Braendle E, Giraldez C, Cochachin A (2017) Compiling an Inventory of Glacier-Bed Overdeepenings and Potential New Lakes in De-Glaciating Areas of the Peruvian Andes: Approach, First Results, and Perspectives for Adaptation to Climate Change. Water 9:1–18. https://doi.org/doi:10.3390/w9050336

Results



Confidence levels	N° lakes
Low	73
Low to medium	64
Medium	26
Medium to high	33
High	38
Lakes in formation or completely formed	53
Total	**287**

Beginning of the formation period	N° lakes
Fully formed or imminent formation	116
Before 2050	59
After 2050	112
Total	**287**



Example of a successfully simulated lake

Conclusions and following steps

- The results are robust in terms of the possible location of overdeepenings.
- Conduct field measurements on prioritized lakes to obtain more accurate estimations.
- Implement actions related to water storage (next years/decades).
- Assess the increasing potential risks related to future lakes and downstream communities and assets.