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1. Introduction

Landslides are common features on the surface of Mars and beyond [1], but the debate regarding their dynamics and the role of water (liquid or frozen) is still ongoing. To help solve this mystery, our study provides new quantitative data on a ~ 7 km long landslide found in a Noachian impact crater, with the aim to: (i) unravel its rheology and mechanical proper- ties, (ii) infer the water content (%) involved in the phenomenon (if present), and (iii) deduce the paleoenvironmental conditions under which the studied landslide occurred.

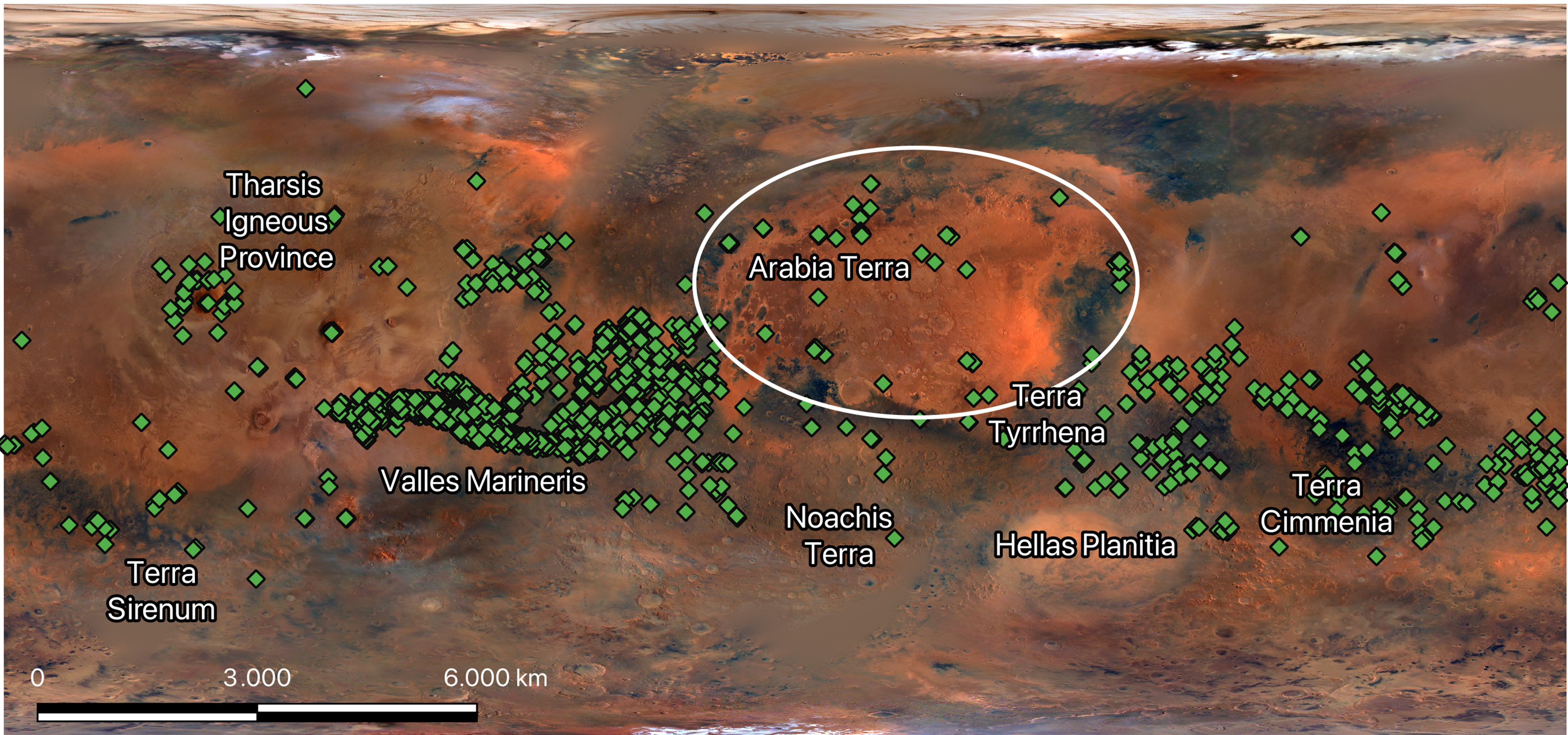


Figure 1. Global distribution of Martian landslides, following the inventory of Crosta et al. (2018); in the white circle, the highland terrains of Arabia Terra, the region selected as the target for our study

2. Scientific Rationale

A limited number of landslides on Mars are well studied and characterized, thus there is more to be explored in this research field. Mass wasting activity may also be useful as a paleoenvironmental indicator because: (i) it is reported almost everywhere on the planet, and (ii) studies on landslides' rheologies may help in deciphering the climatic and geological conditions at the time of occurrence.

This is a poorly explored research field with a high interdisciplinarity and scientific potential, and that is one of the reason behind our choice to pursue such a scientific topic.

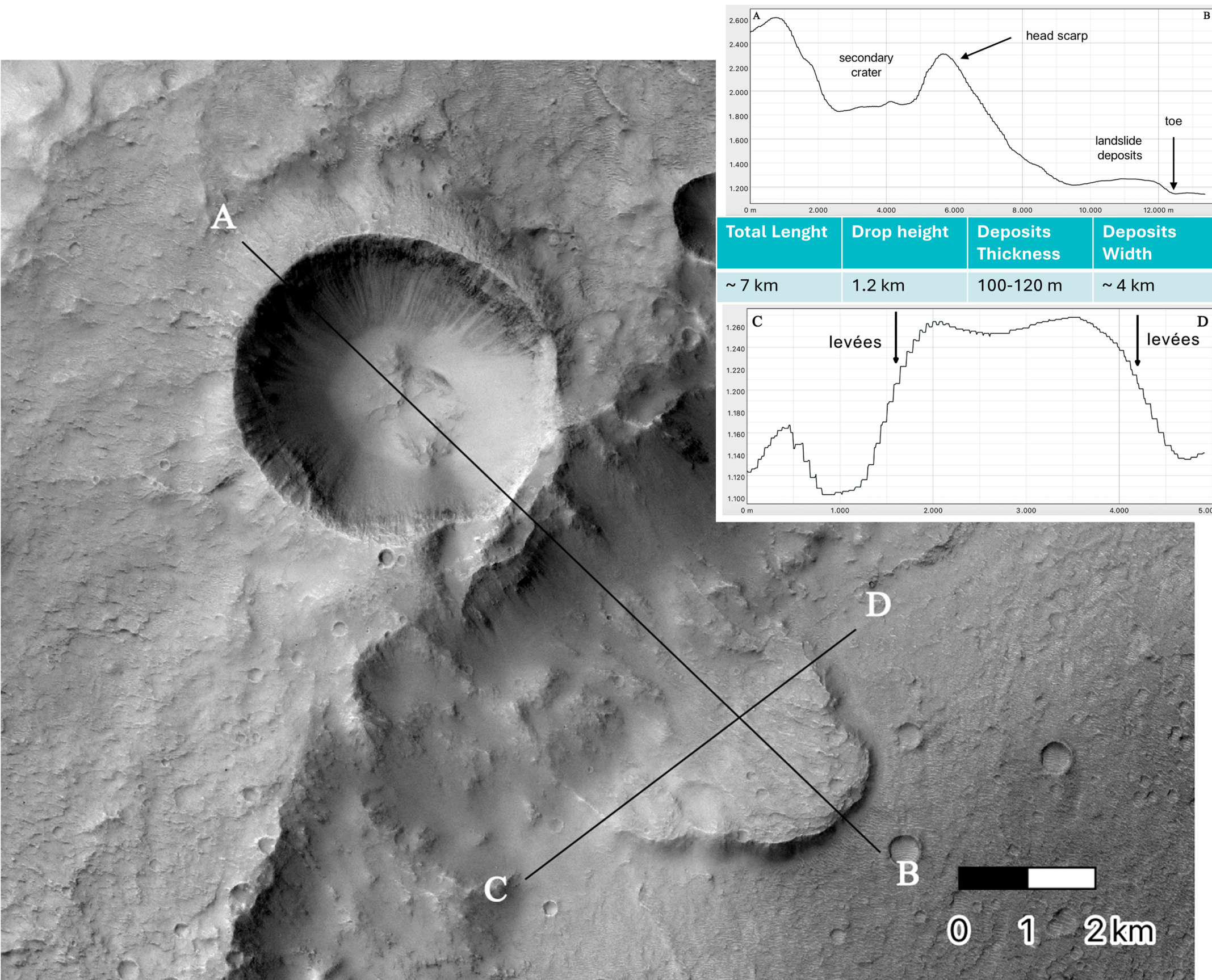
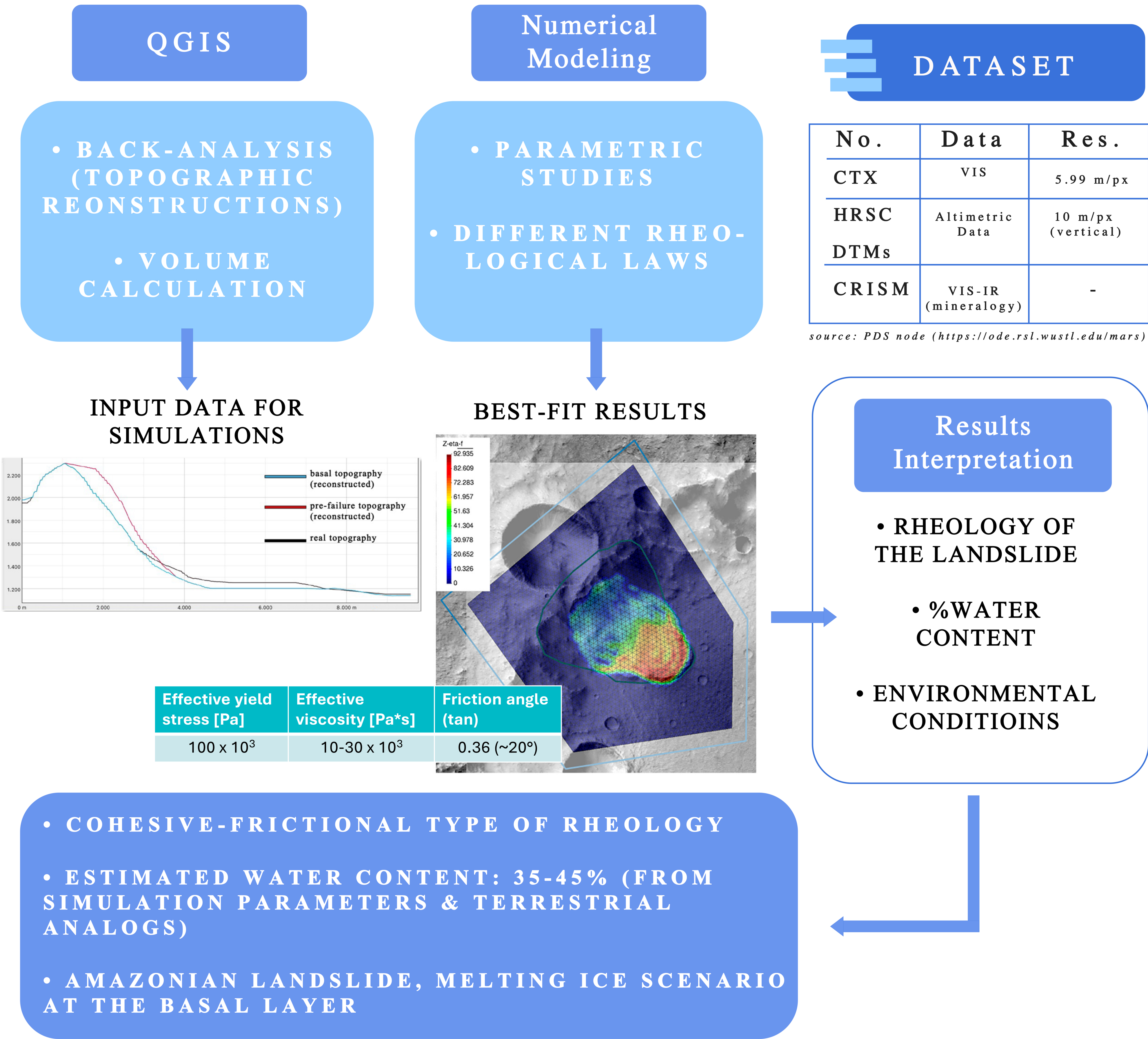


Figure 2. A close look (at CTX resolution) at our case study, located in an unnamed impact crater 300 km far from Isidis Planitia basin; to the right, topographic profiles and morphometrical parameters

REFERENCES:

[1] Brunetti, 2023; [2] Chen and Ling, 1996; [3] Chen and Lee, 1999; [4] Chen and Lee, 2007

3. Data, Methods & Results



4. Conclusions & Future Implications

The results support well the presence of water and highlight the inability of a purely frictional model to reproduce properly the morphologies of the studied landslide. Applying this methodology to Martian (and also planetary) landslides may support the following research field:

SELECTION OF FUTURE LANDING SITES

UNRAVEL PALEOENVIRONMENT CONDITIONS

MARS "SPECIAL REGIONS" IDENTIFICAITON

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