

## **Relationship between subsurface ice reservoirs and Amazonian landslides in the Nilosyrtris Mensae region of Mars**

Anthony Guimpier\*<sup>1</sup>, Susan J. Conway<sup>1</sup>, Nicolas Mangold<sup>1</sup>

<sup>1</sup> Laboratoire de Planétologie et Géodynamique (LPG) – CNRS: UMR6112, Université de Nantes – France

The region of Nilosyrtris Mensae on Mars is characterised by numerous glacier-like-forms and this study focuses on four landslides located in the southern part of this region. These landslides formed in the late Amazonian period, and the glaciers are also believed to be of a similar age. The aim of this study is to understand whether there is a relationship between the glacial ice in Nilosyrtris Mensae and these landslides.

We use images from ConTeXT imager (CTX), Colour and Stereo Surface Imaging System (CaSSIS) and High Resolution Imaging Science Experiment (HiRISE) with resolution of 6 to 0.25 m/pixel and elevation data at 2m/pixel to perform regional and local analyses. We also use terrestrial analogues to better understand the conditions leading to the martian landslides.

The Nilosyrtris Mensae region has many viscous flow features (VFF), which are thought to be nearly pure ice tens of metres thick or more, overlain by debris akin to debris covered glaciers on Earth. VFF are located in the northern part of Nilosyrtris Mensae, and at around 27°N, the frequency of VFF decreases and is replaced by degraded latitude dependant mantle (LDM) on north-facing slopes. LDM is thought to be a metres thick layer of ice and dust laid down in the last few millions of years. Its degradation is thought to be caused by sublimation of the ice resulting in a rough, pitted surface texture.

The 4 landslides are located in a 25 km in diameter impact crater, at 27° latitude. The landslides have well developed lateral levees, high relief lobate flow fronts and propagate over ~20° slopes. These characteristics are typical of earthflows on Earth, which require saturation by liquid water to move, hence liquid water may also be involved on Mars.

Ice melting can cause saturation of the ground, leading to the formation of landslides. By understanding the distribution, extent and character of ice-related features in this region we aim to assess their influence on the formation of these 4 landslides.

**Mots-Clés :** Mars, landslides, earthslides, viscous flow features, latitude dependant mantle