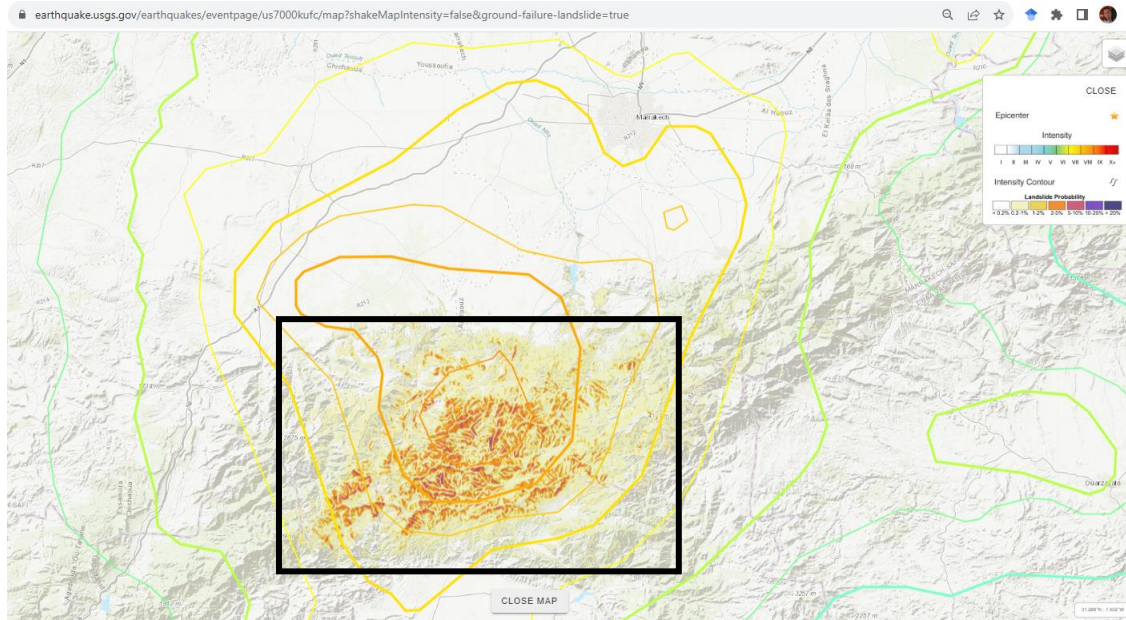


## Preliminary Landslides Assessment for the Morocco Earthquake

On September 8 at 11:11 pm local time, a M6.8 earthquake occurred near Oukaïmeden in Morocco.

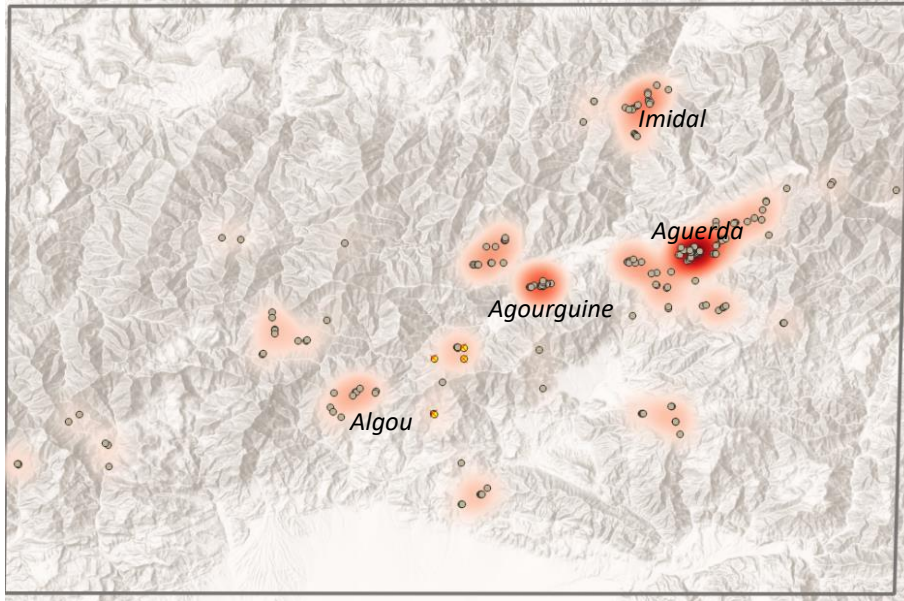


*Landslide probability map associated with the Oukaïmeden earthquake. The black box indicates the area of interest analysed in this report. Modified from USGS (<https://earthquake.usgs.gov/earthquakes/eventpage/us7000kufc/>)*

Five days after the main earthquake, the Geodesy and Earth Observation team at BGS were invited by Philippe Bailey at ESA to become a value adder for the Disaster Charter activation. Within this activation the GRS team have gained access to high-resolution and commercial satellite imagery (GeoEye-1, Pleiades and WorldView-2) provided through the Charter database which have been integrated to the openly available Sentinel-2 satellite data.

BGS analysed ~60 satellites images covering an area of ~4,000km<sup>2</sup> for the period preceding and following the event, (August-September 2023). This area is associated with the largest values of shaking in the Modified Mercalli Intensity map produced by the USGS (<https://earthquake.usgs.gov/earthquakes/eventpage/us7000kufc/>).

As of 18/9/2023, a total of 180 landslides have been identified. These findings represent preliminary information, that have not been verified by field inspections. The distribution of landslides is concentrated near the villages of Imidal, Agourguine and Aguerda, located in the central and northwest portions of the area of interest.



*Heatmap of the density of landslides distribution mapped within the area of interest.*

Most of the slope instabilities are flows with limited area extension (<math><0.01 \text{ km}^2</math>) and covering distances in the order of 100m to 200m. R203 appears to be the route most impacted by these failures, with multiple instabilities mapped within its proximity. However, the resolution of the data does not allow us to evaluate the severity of the damage.



*On the left, Sentinel-2 imagery before the earthquake (29-8-2023). On the right, Sentinel-2 imagery after the earthquake (13-9-2023) showing landslides occurred along road R203, south of the village of Imidal.*

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**Adviser:** Alessandro Novellino, Claire Dashwood

**Capability:** Shallow Geohazards and Earth Observation

