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Flank collapses and tsunami hazard in the Antilles Arc

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We highlight potentially tsunamigenic volcanic flank instability on the north coast of Dominica in the Lesser Antilles arc. 3-D views from Google Earth were key to the initial recognition of this hazardous terrain. Seismic, bathymetric and geomorphological data suggest that this coast is bounded by an active fault structure, with the relatively up-thrown flank displaying evidence of both shallow translational and deep-seated rotational slope instability.

A probable landslide block of $\tilde{1}$ M tonnes on the seaward margin of the instability complex has large tension cracks on its upslope margin, clearly visible on Quickbird satellite imagery and X-band SRTM digital elevation models . Failure of this block could destabilise a larger adjacent upslope block ($\tilde{3}$ M tonnes). Preliminary calculations indicate that landslides at these scales could trigger tsunami waves, locally reaching up to 4 m in height, with the greatest hazard along the southern coast of Guadeloupe, 30-40 km to the north of Dominica.