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The Complex Geomorphology of Neukum Crater on Mars

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Neukum Crater, located at about 28°E/45°S at Noachis Terra on Mars, contains various geomorphological features that indicate a diverse geological history forming the crater during the past up to 4 Ga years. Most prominent features of this 102 km-crater are the large dark dune field and the two pits on its floor. The basaltic composition of the dunes sands, enriched in high-calcium pyroxenes, does not differ from the overall composition of the dark dunes found in various places elsewhere on Mars. Avalanches of the dune slip faces evidence recent seasonal mass movement processes within the dune field. Aeolian processes also left its traces in the form of countless dust devil tracks widespread on the crater floor as well as in the form of transverse aeolian ridges within the pits. These pits, also found in some neighbouring craters, act as geological windows to the subsurface and might have contributed as sources of the dark dune materials of this region. Moraine-like features and mass movements in smoothed terrain along the crater wall whiteness an era of active glacial and periglacial processes at Neukum crater. Superposed ejecta onto these landforms allow determining the minimum age of the features and constraining the timing of geological processes.