

Compressional tectonism control on the subsurface hydrology in NW Xanthe Terra, Mars

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The geomorphology of a Hesperian plains region, situated in North Western Xanthe Terra, west of the northern region of the Simud Valley, is examined and interpreted to be an extensively degraded and topographically relaxed region, resultant of surface and subsurface hydrologic activity. We propose that regional hydrology was controlled by compressional tectonism and propose a hypothesis, which involves ground water being transported to the subsurface and surface regions by the fault systems associated with wrinkle ridges and driven by compressional forces associated with stress fields related to the Tharsis rise. We propose that the water sources, which were involved in this compressional tectonic hydrologic environment, involved mainly water drained from a surface ponded water in the Chryse basin but might have also included water tectonically extracted from aquifers and/or segregated from the permafrost through interaction of intrusive magmatism and permafrost.