



Drainage patterns on Mars in comparison with their analogue valleys on Earth

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Today, Mars is a very dry, cold and fluvial inactive planet, but different types of fluvial valley networks are still conserved. First and foremost, longitudinal and dendritic valleys, slope valleys, and outflow channels are prevailing representatives. Due to the strong action-related dependency between fluvial activity and climate there must have been other environmental conditions on early Mars. However a fundamental climate change on Mars is still not sufficiently explored.

We focus on selected Martian valley networks by using image data of the High Resolution Stereo Camera (HRSC) on board of the ESA Mars Express Orbiter and Context Camera (CTX) images of the NASA Mars Reconnaissance Orbiter. HRSC digital terrain models (DTM) are used to derive morphometric parameters of valleys and interior channels. These measurements aim to constrain fluvial discharge rates. The correlation of the findings combined with results of the crater-size frequency distribution (CSFD) allows interpreting the development and timing of possible flooding events. The resulting data set might give clues to ancient climatic conditions and its influence on the morphology and the discharge rates of the channel systems.