



## Water on Mars - Analyses on fluvial activity of selected valley networks

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Water on Mars is a precondition for a possible habitability as a requirement for the evolution of life on planet Mars. Water is also responsible for erosion, transport and is a trigger for climate and climate changes in Martian history. Therefore, a possible habitability on Mars is one of the main objectives of the HGF Alliance Program "Planetary Evolution and Life".

Valley networks and outflow channels in conjunction with local climate changes on Mars are not yet sufficiently explored.

Mapping of selected valley networks as global representatives is necessary to correlate controls on habitability in their chronological relationship.

Within this study we are focussing on dendritic and longitudinal valley networks over time and space by using the crater-size frequency distribution (CSFD) in order to date the planetary surfaces of the valley networks most accurately on high resolution imagery from the High Resolution Stereo Camera (HRSC) on board of the ESA Mars Express Orbiter.

Morphometric parameters of the channels, as measured from digital terrain models (DTM), will be used to clarify the water and sediment discharge. The correlation of this information, combined with the results of the CSFD, allow us to interpret the development and the timing of the flooding events. The resulting data set might give us clues to ancient climatic conditions and its influence on the morphology and the discharge rates of the channel systems.

The calculations of the bulk fluxes of water and sediment, based on the dimensions of channels and valleys, will be the topic of our future work.