



Depositional analysis of the Eberswalde delta (Mars).

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The delta-like morphology of the Eberswalde crater (33W-24S) represents the most spectacular evidence of a persistent water-related activity discovered on Mars so far.

A detailed geological map of the Eberswalde crater and its drainage basin has been realized associated with a stratigraphic survey to detect the mutual relationships of the sedimentary units. The presence of foresets in the frontal part of the delta-like feature as well as some evidences of wave-related reworking allow to interpret the delta-like feature as a fan delta originated in correspondence to a standing body of water.

We distinguish delta plain and delta front facies passing distally to prodelta bottom-sets. In the delta plain two subenvironments can be recognized, distributary channels, consisting mostly of coalescent point bars, and interdistributary areas, consisting of crevasse splays and plains in which fine material was deposited during flooding. In the delta front, mouth bar and interdistributary bay facies can be distinguished.

The depositional architecture of the lobes ranges from aggradational to slightly progradational, suggesting equilibrium between level of the water table in the lake and sedimentary input. The lobate morphology of the fan delta suggests formation by input-dominated processes, but some wave reworking is locally present.

The evolution of the Eberswalde crater appear to have been partly driven by autogenic processes, such as avulsions, but the major lobes seem to have been formed in correspondence of different levels of the water table, suggesting the importance of allogenic, possibly climatic, controls as well.