

Answers for Mars Hydrology – non-GIS users

A. Local Hydrologic Environment (answer these questions for each grid):

- a. Which is the major direction of flow for this grid?
 - i. Kasei – east, Lucus – north, Margaritifer - northwest
- b. What is the highest stream order you found?
 - i. 5 (for all)
- c. Does the basin shape reflect topography or stream networks?
 - i. Kasei and Lucus – stream networks, Margaritifer – combination/topography
- d. What is the drainage density for this grid? Is the drainage density value high (closer to 1) or low (closer to 0)? What does this mean?
 - i. First must compute stream length totals: Kasei = 5,959 km, Lucus = 8,059 km, and Margaritifer = 5,563 km.
 - ii. Must compute total basin areas: Kasei = 67,935 km², Lucus = 69,637 km², Margaritifer = 75023 km².
 - iii. Drainage density: Kasei = 0.09, Lucus = 0.12, Margaritifer = 0.07; all low.
- e. Would you say that this area has a highly developed stream network or a poorly developed network?
 - i. Lucus and Kasei show evidence for moderately developed systems, Margaritifer poorly.
- f. Suggest a comparable hydrologic environment on Earth for this grid compatible with the results of your analysis.
 - i. Answers vary. Some suggestions – Kasei: stream; Lucus: delta, stream network; Margaritifer: flood zone.

B. Global Hydrology

- a. Where would most water on Mars drain towards?
 - i. Towards the Northern Plains
- b. Do these systems connect?
 - i. Answers vary. Should have supporting evidence either way.
- c. Can you suggest a global history of surface flow for Mars based on these three different hydrologic environments?
 - i. Answers vary.