

Mars for Earthlings

LESSON 12: Surface Water**Homework 1**

Surface Water_MFE

Mars Fluvial Channels: Contour Maps

Purpose: Become familiar with contour maps and learn how to read them. Observe fluvial incised-channels on a contour map of Earth and compare to a contour map of Mars, and make predictions of potential fluvial activity on Mars.

Preparation:

1. If not uploaded to your Google Earth application, load the USGS topographic maps layer to Google Earth using the following website and link:
<http://www.gelib.com/ng-topo.htm>
2. Open the Mars contour map found here:
http://pubs.usgs.gov/imap/i2782/i2782_sh2.pdf

Directions/Questions:*Earth Fluvial Channels*

1. Open Google Earth:
 - a. To get your bearings on Earth, center your map/viewer on the following coordinates: $38^{\circ}27'N$, $109^{\circ}41'W$, near Pyramid Butte, UT.
 - b. What is the major river in the area?
 - c. Find Dripping Spring (southeast of Pyramid Butte). What is the flow direction from Dripping Spring to the nearby major river?

How do the contour lines indicate the flow direction? Sketch an example below of what the contour lines look like in relationship to the stream:

- d. If you were to hike from Pyramid Butte to the nearby campground in the northeast, would you be hiking uphill or downhill? Explain your reasoning.



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- e. Follow the meanders of the major river channel. How are the contours drawn near the river? Do they follow the river? Cross the river? Explain the reason why the contours are drawn that way.
- f. Using the ruler tool, estimate the distance in miles from Pyramid Butte to Musselman Arch to the southwest.
- g. Zoom in on the Goosenecks of the major river. Zoom in enough to see the annotated hand-drawn sand bars of the river. Explain the origin of the sand bars and whether or not you could hike out of the Goosenecks easily.
- h. Is the white area where the words “Goosenecks” are written an area of relief or a depression? Explain your reasoning.

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2. Using the Mars contour map, find Valles Marineris. Look northeast of Valles Marineris, around the 330E/30W longitude line and the Martian equator.
 - a. What features stand out/are enhanced by the contour data (mountains, rivers, craters etc.)?
 - b. Are there any areas that are similar to a fluvial channel? If so, screen capture an image and paste here or sketch what you see as evidence of a fluvial channel.

