

## Mars for Earthlings

**LESSON 12: Surface Water****In-Class Activity 1***Carving Mars: Rivers*

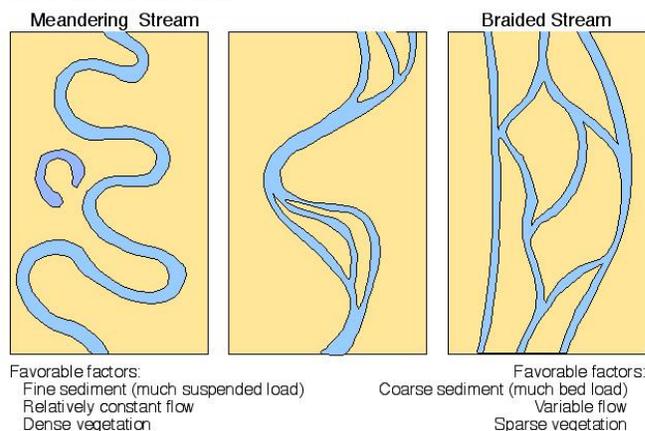
**Purpose:** Observe the formation of fluvial channels, the effects associated with varying water velocity and changing base-level/gradient, and the evidence for fluvial/alluvial environments on Mars.

**Materials Needed:** Internet connection and 3D glasses

**Terms to understand:**

- Cut bank
- Point Bar
- Meandering vs. braided (channel gradient, sediment input)

Map views of river systems:



LBR 3/2002

Source: <http://www.gly.uga.edu/railsback/1121Lxr28.html>,  
<http://commons.wvc.edu/rdawes/G1010CL/Basics/streams.html>

**Why do waters “rage”?**

Watch the following video: <https://www.youtube.com/watch?v=E6sWiPAu708>

As you watch the video, answer the following:

- Where is the river fastest?
- Where do sandbars form?

## Mars for Earthlings

- c. Why does the river form sinuous bends?

**Watching a stream form:**

Observe the Davidson Geology department's stream table experiment:

<http://www.youtube.com/watch?v=YsQ7hW2fAEs&feature=related>

1. Sketch each of the following as you observe it and list a time stamp for each. You may need to watch the video several times (use a separate sheet if necessary).

- a. Formation of a cut bank

- b. Formation of a point bar

- c. Stream avulsion

- d. Formation of multiple channels

2. For each of the sketches, describe why you think it occurred:

- a. Cut bank

- b. Point bar

- c. Stream avulsion

- d. Multiple channels



## Mars for Earthlings

### Seeing Mars stream in Red-Blue?

Explore the HiRISE anaglyph image of the Eberswalde region of Mars using red-blue glasses (blue filter over right eye):

<http://hirise.lpl.arizona.edu/images/2007/details/cut/Eberswalde-delta-3x.jpg>

1. Are any of your stream table sketches similar to what you observe on Mars? Which one(s), if any?

2. Explain how this surface geomorphology on Mars might have formed.

### Mars Rivers?

Access the following Mars Global map produced by MOLA via Google:

<http://www.google.com/mars/>

1. Consider the landscape of Mars. In what regions could water have flowed as braided channels?
2. Would meandering or braided fluvial styles be more common on Mars? Does this differ from Earth? If so, how?



## Mars for Earthlings

### Just checking....

In reference to Figure 1, answer the following:

- a. Where would it be safe to build a house (draw at least 2 arrows to areas in the photo where you would feel comfortable building a house)?
- b. Where is deposition occurring? What about erosion?

With reference to the “scars”:

- c. What does this tell you about the meanders?
- d. Can you discern which meanders are older and which are younger?
- e. Do you observe similar geomorphology on Mars?



**Figure 1** RIO NEGRO, COLONEL JOSEFA AREA, FLOOD PLAIN

Center Point Latitude: -39.8 Center Point Longitude: -65.4

(Image Source: [ftp://eol.jsc.nasa.gov/EFS\\_highres\\_ISS022\\_ISS022-E-19513.JPG](ftp://eol.jsc.nasa.gov/EFS_highres_ISS022_ISS022-E-19513.JPG). ISS/NASA)