

Mars for Earthlings

LESSON 17: Vast Deserts**Homework 1**

Vast Deserts_MFE

*"Bounding" through Dunes***Purpose:**

- Recognize bounding surfaces in Google Earth imagery and their meaning in the geologic record.
- Understand why bounding surfaces are or are not recognized on Mars.

Preparation:

Make sure you have Google Earth downloaded on your computer to accomplish this exercise. <http://www.google.com/earth/download/ge/agree.html>

Questions:

Checkerboard Mesa, Zion National Park UT

1. Open Google Earth (load the free program if necessary).
2. Navigate to 37°13'30.75"N 112°52'54.13"W and orient the window looking Southwest. See image below* for orientation of your viewing window.

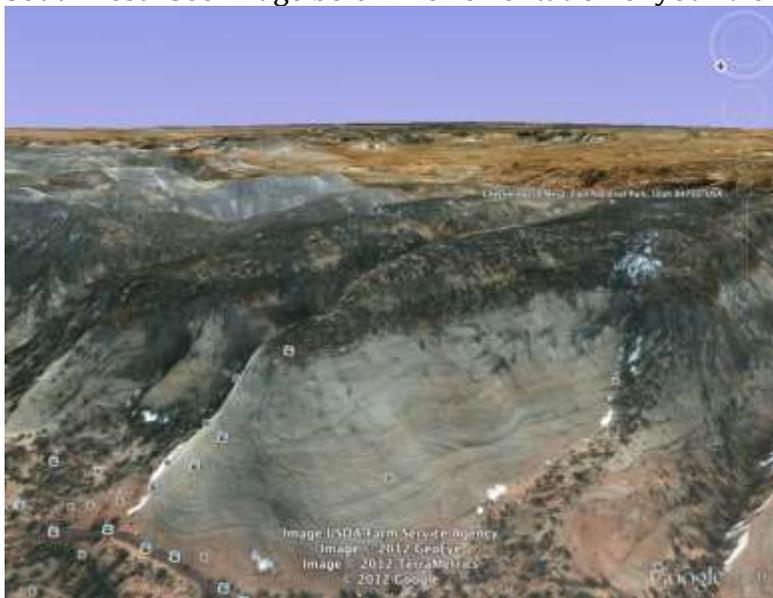


Figure 1 Image captured through Google Earth

Capture your own .jpg and insert your image into a PowerPoint file.

*the image in this exercise is not zoomed in or large enough for your PowerPoint slide

3. In PowerPoint, annotate your image with the following:
 - a. Paleocurrent direction- red arrows
 - b. Bounding surfaces- green lines
 - c. Dunes are "marching towards you" – blue triangles
 - d. Dune are "marching away from you" ...in any direction – orange triangles



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4. On another slide, answer the following questions
 - a. What do the bounding surfaces represent?
 - b. What created the sinusoid (sine wave) morphology of the beds?

Burns formation, Meridiani Planum Mars

5. Insert the following Burns formation image into a slide and do the following:



Figure 2 Left Panoramic Camera Non-linearized Sub-frame EDR acquired on Sol 288 of Opportunity's mission to Meridiani Planum at approximately 13:10:16 Mars local solar time, camera commanded to use Filter 7 (432 nm). NASA/JPL/Cornell

- a. Follow the same instructions for labeling as for Checkerboard Mesa above (answers to the following questions should be given in a separate slide).
- b. What are the main differences between Checkerboard Mesa and the Burns Formation outcrop? Cite at least 3.
- c. Do you think the Burns Formation was formed in an eolian environment? Why or why not?
- d. In the below photos, how is the colorized imagery helpful? What do you observe in Image C of Figure 3? Why do some layers "look different"?

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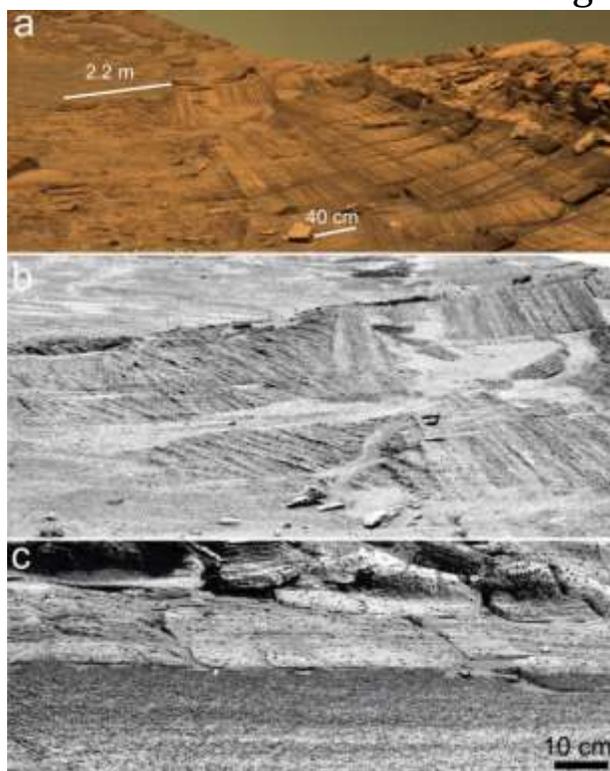


Figure 3: Burns Formation stratigraphy (Grotzinger et al., 2005).

6. Turn your .ppt presentation/slides into your instructor.