**Topographic Map Study Questions**

The following maps include various karst terrains as well as various river- and glacially-modified landscapes and landforms. The following questions are not intended to be comprehensive, but are intended to provoke critical thinking and help improve your topographic map reading and interpretation skills.

**East Brownsville, TX**

1. What is the contour interval of this map?
2. What stage of fluvial landscape development is shown here (youth, maturity, old age, or rejuvenation)?
3. Would you expect the USA-Mexico boundary to frequently change position over time? Why?
4. What are the curved lakes found on this map called, and how do they form?
5. In which direction would you expect to find the ocean (north, south, east, or west)?
6. Note the amount of human modifications that have been made to the fluvial system on this map.

**Ennis, MT**

1. What is the contour interval of this map?
2. Locate the Cedar Creek Alluvial Fan along the eastern edge of the map. In what type of climate/environment does this feature form?
3. What topographic features would you expect to find east of the alluvial fan?
4. Note the “V” shape of the contour lines where they intersect the streams draining from the alluvial fan. What does the “V” shape indicate about the stream flow direction?
5. Calculate the approximate stream gradient of the alluvial fan.
6. Locate the Madison River in the northwest portion of the map. What type of river pattern is shown here?

**Gainesville West, FL**

1. What is the contour interval of this map?
2. Locate the interchange between Route 75 and Route 222 near the center of the map. Just east of the interchange and immediately north of Route 222 are several contours with hachure marks. What do these contours indicate?
3. What type of feature is represented here?
4. Locate Devils Millhopper State Geological Site on the map. What is the topographic feature that is represented here? How deep is it?
5. Note the adjacent ponds and low-lying swamps surrounding the Devils Millhopper site. What would you estimate is the elevation of the groundwater table at this location?
6. Why do you think the depression at Devils Millhopper has not filled up with water to an elevation that approximates the surrounding groundwater table?
7. What is the approximate elevation of the groundwater table at Hogtown Prairie?
8. Calculate the approximate groundwater gradient between the water table near Devils Millhopper and Hogtown Prairie.

**Lake Scott, KS**

1. Note the drainage patterns shown on the map. What type of drainage pattern is represented on this map?
2. In which direction is the overland drainage flowing “off” the map (north, south, east, or west)?
3. Is Lake Scott a natural or artificial lake?
4. Locate Ladder Creek, south of Lake Scott, on the map. What stage of fluvial landscape development is shown here (youth, maturity, old age, or rejuvenation)?
5. How does the fluvial landscape development of Ladder Creek differ north of Lake Scott?

**Luray, VA**

1. What is the contour interval of this map?
2. Locate the Shenandoah River on the map. What stage of fluvial landscape development is shown here (youth, maturity, old age, or rejuvenation)?
3. How do the dotted contour lines on this map differ from the solid contour lines?
4. What does the surface topography of the Page Valley indicate about the underlying geology? How does this type of topography form?

**Mammoth Cave, KY**

1. Locate the Green River on the map. What stage of fluvial landscape development is shown here (youth, maturity, old age, or rejuvenation)?
2. What are these types of meanders called?
3. Locate the Eaton Valley, Houchins Valley, and Doyel Valley on the map. What drainage pattern exists within these valleys that feed into the Green River?
4. East of the Mammoth Cave National Park boundary is the Hamilton Valley. What features in this area would indicate that this is a karst terrain?

**Michigan Center, MI**

1. What is the contour interval of this map?
2. The topography of this area has been shaped by continental glaciations (the last ice age) that began during the Pleistocene and ended approximately 12,000 years ago. Locate Blue Ridge on the map. This sinuous landform is composed primarily of well-sorted sand deposits. What is this landform and how did it form?
3. Note that the area is riddled with small depressions and rounded lakes. What are they called and how did they form?
4. Do you think Center Lake is a glacially formed lake? Why or why not?

**Mount Tom, CA**

1. What is the contour interval of this map?
2. What is the NW-SE trending landform that also marks part of the boundary between Fresno and Inyo Counties?
3. Steelhead Lake drains into three other lakes (L, Moon, and Elba). What are these glacially formed lakes called?
4. What type of glacially formed lake is Longley Lake?
5. The area where Pine Creek flows northeast out of the mountains has experienced glaciations in the past. Is it possible to determine how far the glacier extended down Pine Creek? If so, how do you know?
6. What type of drainage pattern exists around Mount Tom?

**North Palisade, CA**

1. What is the contour interval of this map?
2. This area has been affected by alpine glaciations. What glacial landform also serves as the border between Fresno County and Inyo County?
3. What type of glacial landform is Mount Agassiz?
4. A series of bowl-shaped depressions marks the perimeter of the Dusy Basin. What are these glacial landforms called?
5. What are the glacially formed Rainbow Lakes called?
6. Locate the small lake at an elevation of 11,115 feet, below the letters “ON” at the end of the word “Canyon” in Kings Canyon National Park. What is this type of glacially formed lake called?
7. In which direction is the overland drainage from the streams and rivers of Fresno County flowing “off” the map (north, south, east, or west)?
8. What stage of fluvial landscape development is shown here (youth, maturity, old age, or rejuvenation)?
9. What is the lowest elevation on the map? What is the highest elevation on the map?
10. What is the topographic relief of this map?

**Paw Paw, WV**

1. Locate the Shenandoah River on the map. What stage of fluvial landscape development is shown here (youth, maturity, old age, or rejuvenation)?
2. Locate Reckley Flat and the town of Paw Paw in the southwest corner of the map. What former fluvial features are represented in these locations?
3. Would you expect a cutoff to develop anywhere along this stretch of the Shenandoah River shown on the map? If so, where might one form?

**Voltaire, ND**

1. What is the contour interval of this map?
2. Locate the Souris River on the map. What stage of fluvial landscape development is shown here (youth, maturity, old age, or rejuvenation)?
3. How did the depressions (hachured contours) in the Souris River floodplain form?
4. The terrain above the Souris River floodplain is composed primarily of glacial till deposited during the last ice age. What type of lakes are Stink Lake and Lake Hester?
5. Locate the NW-SE trending ridges adjacent to these lakes. These ridges are also composed of varying amounts of glacial till that are wider at the NW end and taper to a narrower point at the SE end. What might this indicate about the direction of glacier flow?
6. What might we call these ridge-like features?

If you have any questions about these maps, the geology resources in the Science Learning Center, or a geology question that can’t be answered by someone available in the SLC, consider stopping by the geology lab prep room (CS 203) and ask for NOVA’s Geology Program Assistant, Jim Buecheler, who may be able to help.

Are any of the maps or other geology resources in the Science Learning Center missing or out of place? If so, please notify either Jim Buecheler or Science Learning Center coordinator Robin Rohrback.

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