**Laboratory 11 Answer Sheet**

For use with the AGI/NAGT Laboratory Manual in Physical Geology, 11th ed.

**INSTRUCTIONS**

(1) Your responses on this answer sheet must be the result of **your work alone.** This is not a group-work exercise.

(2) This answer sheet with your responses is a **confidential document** that you must not provide to anyone else or to any group file (digital or paper) where others might gain access to the answers.

(3) Before you submit it to your TA for grading, **you must rename this document with your first and last names in the title**. So if the answer sheet was submitted by Theodore Roosevelt, the document (saved as a Word file) would be renamed Theodore-Roosevelt-Lab11Answers.docx

(4) Send this form, completed, to your graduate teaching assistant in an email from your Baylor email account. Be certain that the **subject line is your first and last name plus "Lab 8 answers."** So if this answer sheet was submitted by Theodore Roosevelt, the subject line of the email would be "Theodore Roosevelt Lab 11 answers." **Include this completed document in the email as an attachment.**

 All Tuesday labs: Zequn Wu Zequn\_Wu1@baylor.edu

 Wednesday 12:20-2:25 lab: Kate Hobart Kate\_Hobart1@baylor.edu

 Wednesday 2:30-4:25 lab: Amanda Wang Zhao\_Wang1@baylor.edu

 All Thursday labs: Sam Barber Samuel\_Barber1@baylor.edu

(5) Wherever you encounter <response> in the raw answer sheet, **replace** <response> **with your answer or response.**

 EXAMPLE

 What is your favorite color? <response> might become

 What is your favorite color? green

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**Your Name:** <response>

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**Activity 11.1 Streamer Inquiry**

The *Streamer* Web ap is accessible via <http://water.usgs.gov/streamer/web/>

A-1 What is the name of the community you are focusing on? (As a default, you can use the community that Baylor is located within: Waco, TX.) <response>

A-2 (This item requires an action using *Streamer*, but not a response here.)

A-3 (This item requires an action using *Streamer*, but not a response here.)

A-4 (a) Trace Origin Stream Name: <response>

(b) Trace Origin Elevation (ft): <response> feet above sea level

 Trace Origin (latitude, longitude): <response>

(c) Cities (count): <response>

(d) Stream Names (count): <response>

(e) Total Length of Traced U.S. Streams (miles): <response>

(f) (This item requires an action using *Streamer*, but not a response.)

B-1 (This item requires an action using *Streamer*, but not a response here.)

B-2 (This item requires an action using *Streamer*, but not a response here.)

B-3 (a) Stream Names (count): <response>

(b) Cities (count): <response>

(c) Total Length of Traced U.S. Streams (miles): <response>

(d) "Outlet Waterbody" that this stream discharges to: <response>

(e) Last community or feature this stream passes before discharging to the "Outlet Waterbody": <response>

(f) (This item requires an action using *Streamer*, but not a response.)

C-1 (This item requires an action using *Streamer*, but not a response here.)

C-2 (a) Which stream segment (upstream or downstream) handles the most water in a given amount of time? <response>

(b) Which stream segment (upstream or downstream) has a greater average channel width <response>

(c) Which stream segment (upstream or downstream) flows down a steeper slope (i.e., has a greater average channel gradient): <response>

C-3 How many stream gages are used to monitor this river system? <response>

D Why would a community along a stream want to know where its stream water comes from? <response>

What else might the community want to know about the water? <response>

E Why would a community along a stream want to know where its stream water goes after passing the community? <response>

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**Activity 11.3 A Mountain Stream**

A-1 The type of streams in the mountains: <response>

A-2 The type of streams on Cedar Creek alluvial fan: <response>

A-3 The type of streams in the Madison River Valley: <response>

B & C This response involves drawing on Figure A11.3.1 (page 313 in the paper version of the lab manual). ***Be quite certain that the drawn lines and labels on the version you submit for credit are clear and legible, perhaps by going over them with a dark pencil or pen.***

A PDF image of Figure A11.3.1, which is copyright © 2017 by Pearson Higher Education and AGI, is available via a link Dr. Cronin sent to you in an announcement accessible via your email or in Canvas. This can be used by students who are using the etext.

When you complete your graphics work on Figure A11.3.1, ...

(1) Scan or photograph the profile box below the map

(2) Get the image file onto the computer you are using to complete this Word document. For example, you can take a picture of the profile box with your smartphone, send it to yourself via text or email, and download the graphics file to your computer.

(3) Open this word document with your Lab 11 answers

(4) Highlight the response prompt

(5) Go to the "Insert" drop-down menu in the menu bar at the top of the page, select "Pictures" and "Picture from file..."

(6) Choose the graphics file you just downloaded.

The graphic should now be a part of this Word answer document.

The response prompt Activity 11.3 parts B and C is on the next line:

<response>

Contact Dr. Cronin if you run into trouble uploading your answer.

D What is the average gradient\* of Cedar Creek along the profile you just made in parts B & C of this activity...

 1 ...from point K to point I? Gradient: <response> ft/mi

 2 ...from point L to point J? Gradient: <response> ft/mi

\*The gradient is the change in elevation between the two points (measured in feet) divided by the horizontal distance between the two points (measured in miles).

The elevations of the two points can be interpreted from the topographic contours on the contour map. Each of the red dots is located along one of the thicker index contours. The elevation of all of the index contours is labeled somewhere on the map, and the elevation change between adjacent index contours along a slope is 200 feet.

For example, the elevation of point J is 5800 feet, and the index contour at point J has a 5800 label as you follow the contour up to near the top of the map. On the profile box below the map, point J is plotted directly below where point J is located on the map, at an elevation of 5800 feet (see the elevation scale on the right of the profile box).

E How does the stream's gradient change downstream as it enters the alluvial fan? <response>

How might this change in gradient contribute to the formation of the alluvial fan? <response>

F Natural streams on an alluvial fan flow perpendicular to the topographic contours (see Figure 11.5). Can you find any streams mapped on the alluvial fans in Figs. 11.2 or A11.3.1 that do not follow this expected flow direction? <response>

If your previous answer was "yes", what might have caused this unexpected flow direction? <response>

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**Activity 11.5 Meander Evolution on the Rio Grande**

A The two directions (toward or away from the meander, upstream or downstream relative to the direction of river flow) that the cutbanks have moved are <response> and <response>

B-1 In what country were H and I located in 1936? <response>

B-2 In what country were H and I located in 1992? <response>

B-3 Explain a process that probably caused locations H and I to change from meanders to oxbow lakes. <response>

C How might the river change in the future at locations J and K? <response>

D What are features L, M, and N, and what do they indicate about the historical path of the Rio Grande? <response>

E What is the average rate at which meanders like A through G migrated (in meters per year) from 1936 to 1992? <response>

Explain your reasoning and calculations. <response>

F Explain in steps how a meander evolves from the earliest stage of its history as a broad, slightly sinuous meander to the stage when an oxbow lake forms <response>

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**Activity 11.6 Retreat of Niagara Falls**

A Niagara Gorge is about <response> km long today.

X <response>

B The rate at which Niagara Falls is retreating is approximately <response> cm/year.

C Factors that could cause Niagara Falls to retreat at a ***faster*** rate include the following: <response>

D Factors that could cause Niagara Falls to retreat at a ***slower*** rate include the following: <response>

E At its current rate, it will take about <response> years for the falls to reach Lake Erie.

F How might the process that formed Niagara Falls have begun? <response>