NAME: _____ PERIOD: _____ DATE: _____

LAB PARTNERS: _____ LAB #12

STREAM PROFILE/CHARACTERISTICS OF A RIVER SYSTEM

INTRODUCTION

All things in nature go through changes in their life time. As animals go through changes from a baby through old age, as does earth's river systems. These stages are classified as youthful, mature, and old age. In each stage of development changes occur that can be seen in the physical appearance of the river and the lands it flow through.

OBJECTIVES

After the completion of this exercise you will be able to:

1. Describe the profile of the Connecticut River System from its mouth to its source.
2. Calculate the average gradient of the Connecticut River from its mouth to its source.
3. Compare and contrast characteristics of river systems in youthful, mature, and old age.

MATERIALS

Pencil w/eraser
Calculator
Earth Science Reference Tables
Colored Pencils

APPROXIMATE TIME 2 periods

PART 1

PROCEDURE

1. Draw a profile of the Connecticut River by plotting the 25 points (0 – 24) of distance vs. height on the graph paper.

2. Label each point with the number of the locality. As you plot each point connect them in order with a smoothed curved line.

3. Label the source and mouth of the river on the profile. Also label the part of the river that is youthful, mature, and old age.

4. Answer the laboratory summary questions 1-7 on page 3.

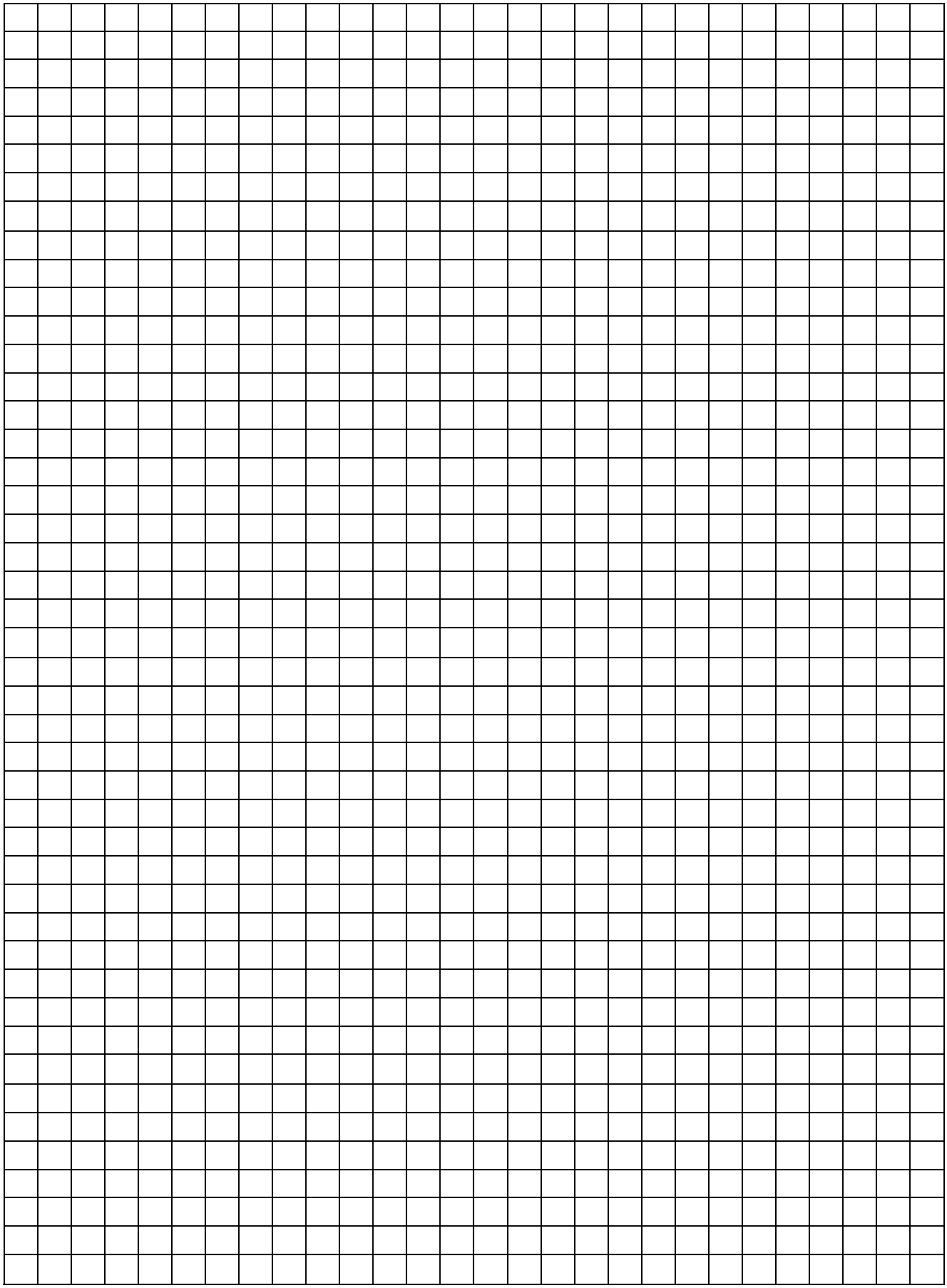
5. On page 4 fill in at least 6 characteristics of each stage of river development.

6. In the rectangles to the left of the listed characteristics draw 2 views of the river in that stage of development. One will be an overhead view and the other a cross sectional view.

POINT	DISTANCE FROM MOUTH (miles)	HEIGHT ABOVE SEA LEVEL (feet)
0. Mouth	0	0
1. Hartford	50	0
2. Foot of Enfield Rapids	60	10
3. Top of Dam	66	40
4. Top of Holyoke Dam	84	100
5. Railroad Crossing	115	110
6. Turner's Falls	120	175
7. Outlet of Ashuelot River	136	210
8. Westmorland	159	220
9. Foot of Bellows Falls	170	235
10. Crest of Bellows Falls	170	280
11. Beaver Meadows	181	290
12. Windsor	196	300

POINT	DISTANCE FROM MOUTH (miles)	HEIGHT ABOVE SEA LEVEL (feet)
13. White River Junction	209	340
14. Hanover	213	375
15. Oxford	230	380
16. Wells River	255	410
17. MacIndoes Falls	262	430
18. Lower Waterford	273	645
19. Head of 15-Mile Fall	285	830
20. North Stratford	312	885
21. West Stewartstown	344	1035
22. Connecticut Lake	361	1620
23. Second Lake	369	1880
24. Third Lake	375	2040

Height (feet)



Distance (miles)

LABORATORY QUESTIONS

1. According to your graph between which 2 numbered points would the gradient of the river be the greatest?

   _____

   How can you tell? _____

2. According to the graph between which 2 numbered points would the gradient of the river be the least?

   _____

   How can you tell? _____

3. Calculate the average gradient between Hartford and Third Lake. (Show the formula and all calculations).

4. Compare the overall gradient of a youthful river system to that of an old age river system.

_____

_____

5. As the overall gradient of a river increases what happens to the water velocity and its resulting erosional power?

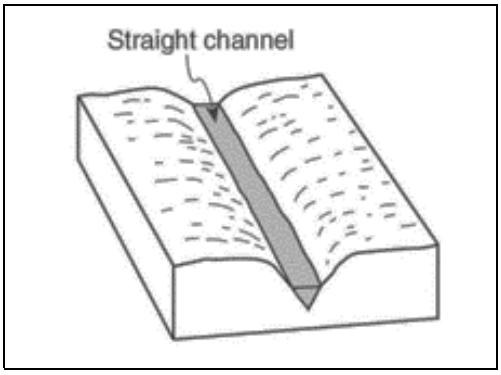
_____

_____

PART 2
STREAM EVOLUTION

For each stream stage describe the speed of the river, compare the rate of erosion versus deposition and include any important stream features, like oxbow lakes, floodplains, etc. Draw what the stream will look like in the box provided, note the first stage is already drawn.

Characteristics of a Youthful River



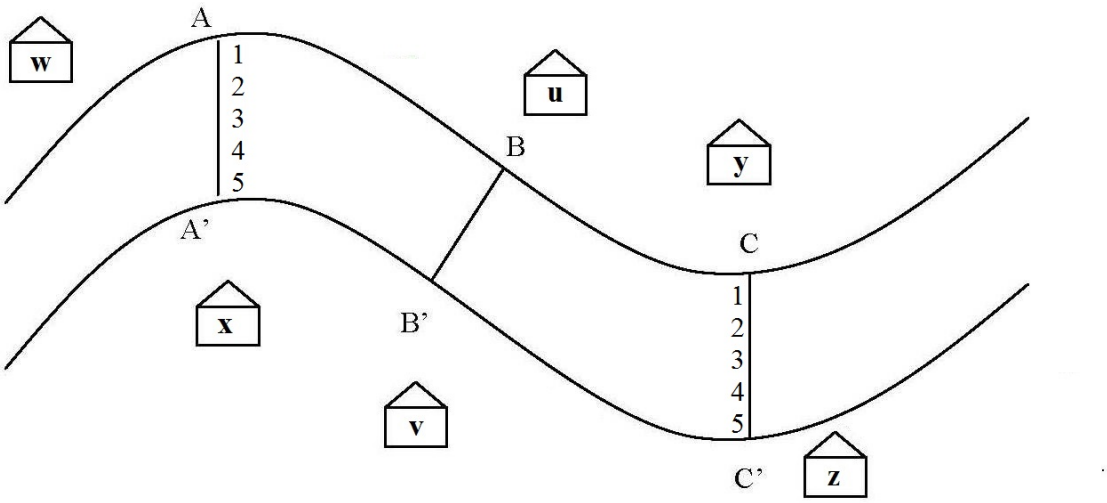
Characteristics of a Mature River

Characteristics of Old Rivers

PART 3

STREAM EROSION/DEPOSITION AND PROFILES

Top View of Stream: On the diagram below, label the areas of erosion color those in RED. Label areas of deposition color those in GREEN. Lastly, label where the river is going faster and slower at each cross section.

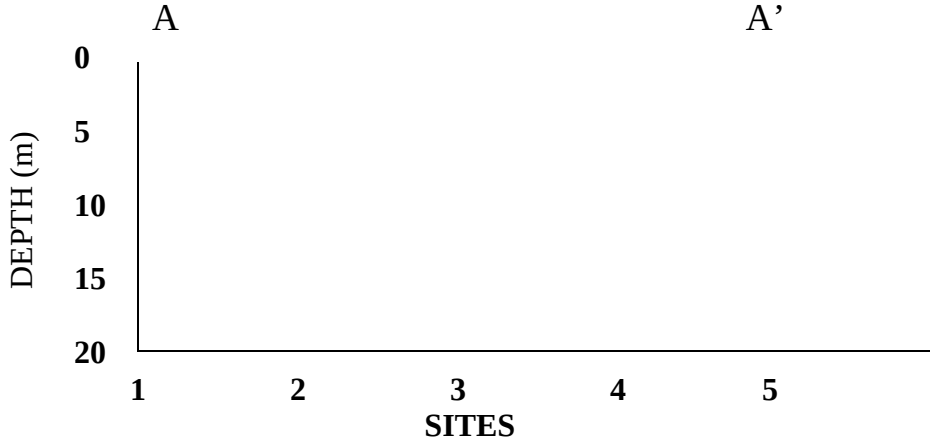


The table below gives the depth measurements at two places in the river shown above. Spot numbers represent points along the lines across the river.

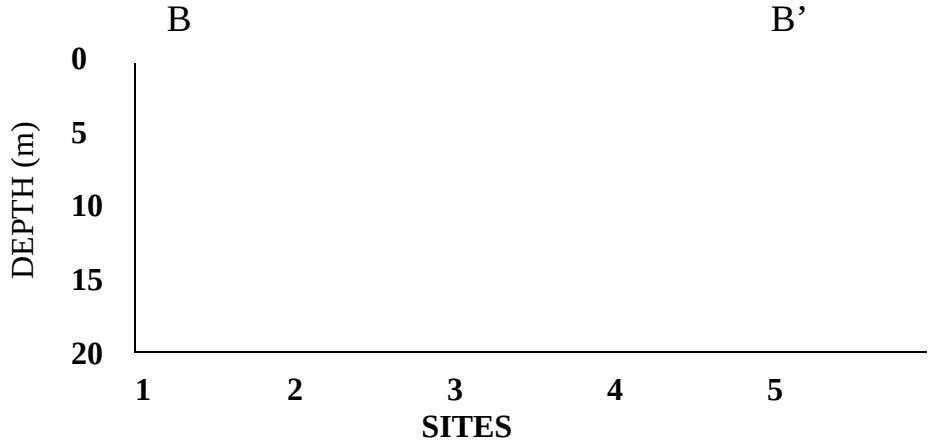
Location	Spot	Depth (m)	Location	Spot	Depth (m)
A – A'	1	2.0	**B – B'**	1	2.0
	2	15.0		2	12.0
	3	12.5		3	17.0
	4	8.0		4	12.0
	5	2.0		5	2.0

1. Plot the depths from the data table on the graphs below.

CROSS-SECTION A – A'

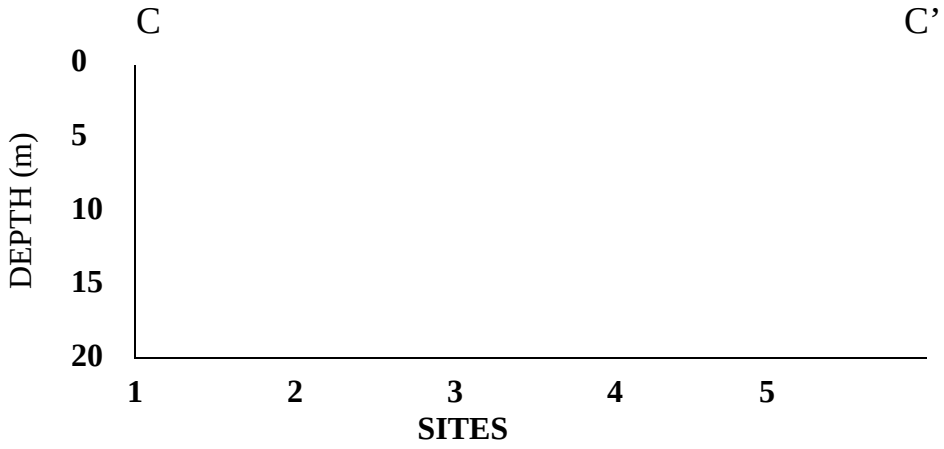


CROSS-SECTION B – B’



Directions: On the graph for C – C’, draw a cross-sectional view of what you think the channel shape at C – C’ would would look like.

CROSS-SECTION C – C’



LABORATORY QUESTIONS

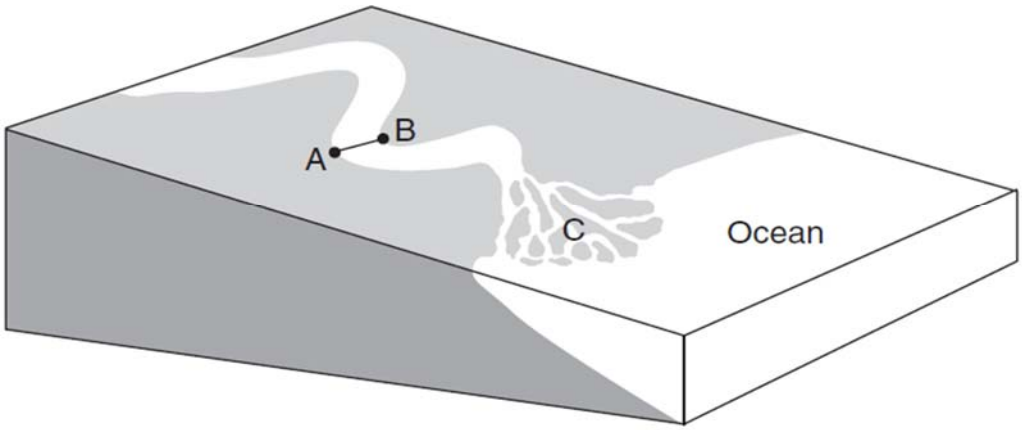
1. On line A – A’, where is the velocity of the water fastest? How does the cross-section of A – A’ show this?

2. If you were going to buy one of the houses labeled U to Z which one would you avoid? ____ Explain why you avoided it:

3. What house(s) would be a good choice to purchase? _____ Explain why it is a good idea to purchase these:

4. What is the relationship between the velocity of the water and the depth of a river channel?

5. Based on what you just learned about where rivers are deeper and shallower in a meander, draw a line from point A to point B to represent a cross-sectional view of the shape of the bottom of the stream channel:



A **B**

6. Identify the triangular-shaped depositional feature indicated by letter C. _____

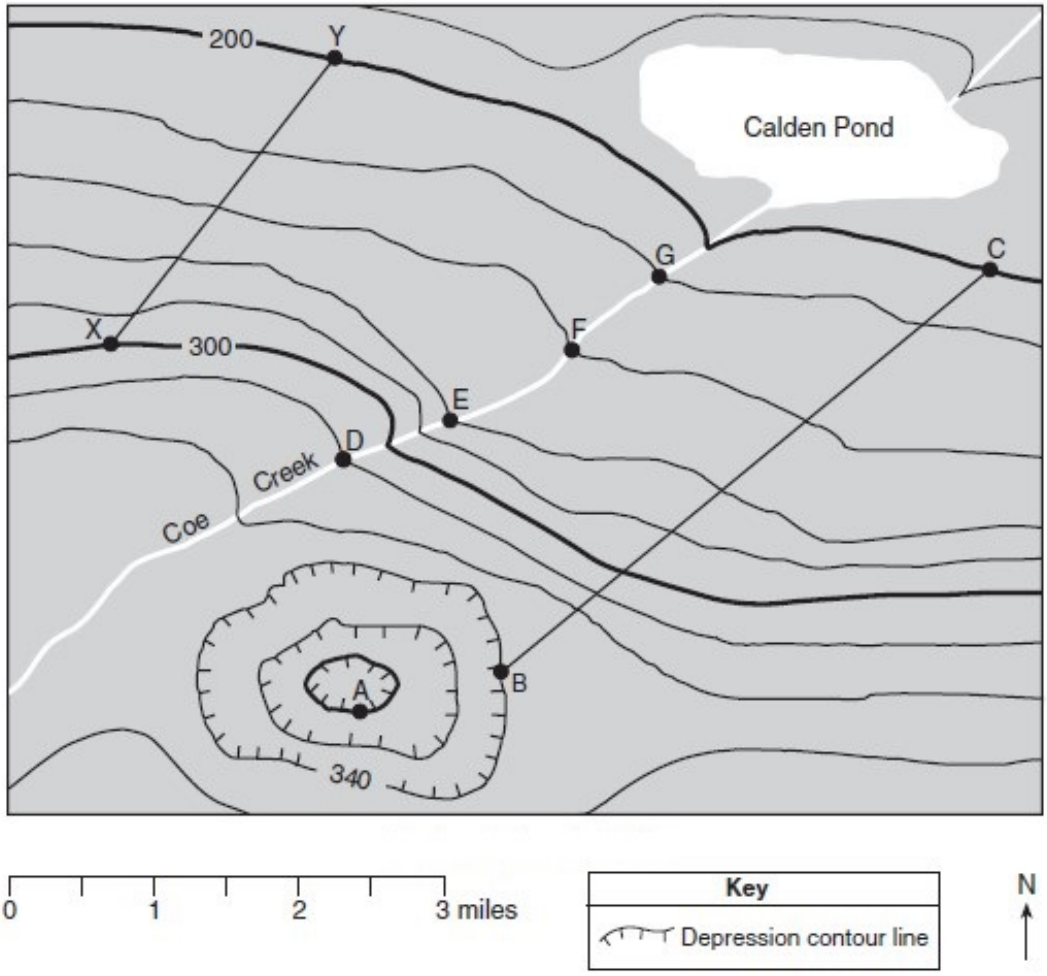
7. Explain how sediments eroded by the water in this stream become smoother and rounder in shape.

8. Identify TWO factors that determine the rate of stream erosion.

_____ _____

PART 4

USING TOPOGRAPHIC MAPS TO IDENTIFY STREAM FEATURES



1. What is the contour interval of this map? _____

2. Describe the evidence shown on the map that indicated Coe Creek flows toward the northeast.

_____

_____

_____

3. Describe how the contour lines indicated that Coe Creek flows faster between locations D and E than between locations F and G.

_____

_____

_____

4. Now using the gradient formula located in your ESRT, calculate the gradient between points F and G. SHOW ALL WORK below, include proper units!

5. Calculate the gradient between points D and E. SHOW ALL WORK below, include proper units!

6. Explain how the gradient calculations from questions 4 and 5 support your answer in question 3.

_____

_____

_____

_____

_____