

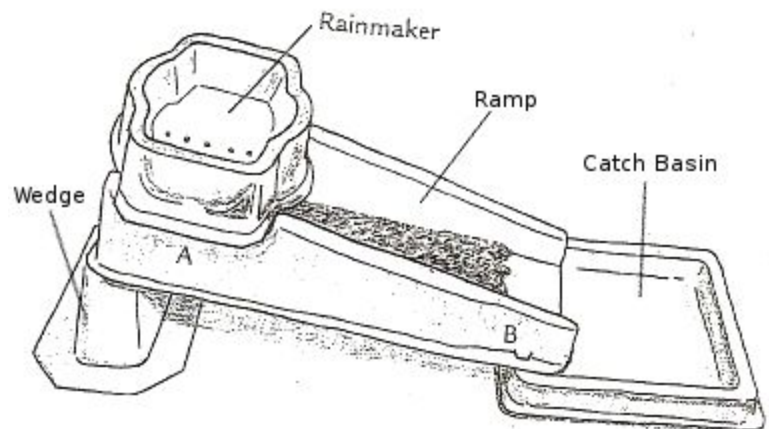
The Effect of a Meander of a Stream on the Erosion & Deposition in a Stream Bend

Introduction:

A meandering river is a type of river that involves curving and bending of the path. These curves and bends appear due to the decrease in gradient, or the slope of the land in which the river sits on. In the water of the river, activities of high and low velocity occur. High velocity, occurs on the outside of the meanders, causing the rapid flow of the river water. This high velocity causes erosion in the cut banks; carving the shape of the land that meets alongside the river. Low velocity, or a slow water flow/speed, occurs in the insides of the meandering river. The result of the low velocity occurring causes deposition, sediment carried away by the water, to occur in the insides of the meander, also known as point bars. In this Lab Report, the purpose of this experiment is to determine how does a meander of a stream affect the erosion and deposition in a stream bend. If the stream meanders, then more erosion would occur to the cut banks and more deposition will be accumulated on the insides of the meander, creating point bars with more amounts of sediments due to the high velocity located in the outsides of the meander and low velocity located in the insides of the meander.

Methods:

Set up the river model by placing the edges of the ramp on top of the wedge and the catch basin. The edges should lock onto each other. Next, place the predetermined amount of sand onto the ramp between points A and B of the ramp. Then, place the rainmaker on top of the ramp, the side where the wedge sits. Afterwards, pack the sand and level it in a layer using a finger or a spoon. Carve out two meandering paths on the sand, using either finger or spoon. To begin the investigation, first add 50 mL of water onto the rainmaker. Wait for the water to take effect on the sand and observe. Repeat these two previous steps 2-3 more times. (To see how the contraption should look like after setup is complete, refer to the diagram on the right.)

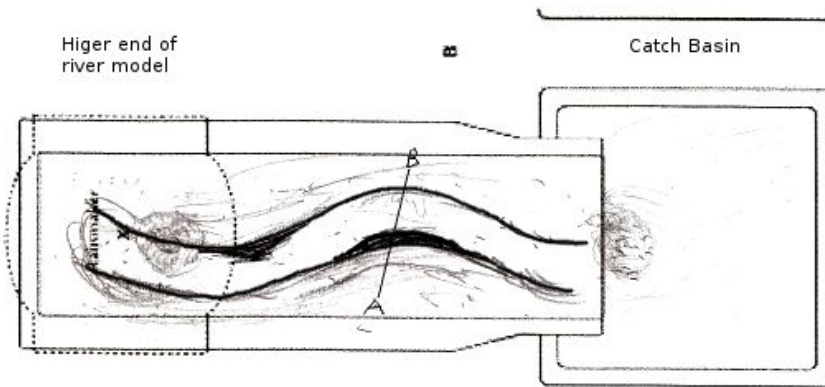


This is how the Meandering River Model should look like after all the materials have been set up

Results:

The experiment resulted in the paths of the meander to change. Firstly, the outside meanders were carved out by the flowing water causing the width of the paths to increase a bit. Secondly, there was more sediments that deposited on the insides of the meanders, causing the point bars to look larger in size as the 50mL of water were added onto the experiment. Lastly, there was also deposition of the sediments that flowed into the catch basin, but there is not a huge amount.

Diagram of the meandering river after 50mL of water is added 3 times



<p>Illustration of profile of meander:</p>	<p>Description of Data/Observations:</p> <ul style="list-style-type: none"> - The path of the river became a little bit wider, more specifically, the water carved the outsides of the meander each time water was added. - There are deposition of sediments on the insides of the meander. As each 50mL of water was poured more sediments were carried away and deposited on this area, and formed a point bar. - Although there was an apparent amount of deposition of sediments that landed in the catch basin, there were not that much.
--	--

Discussion

The hypothesis for the experiment was if the stream meanders, then the amount of erosion and deposition will increase because the high velocity, located in the outsides of the meanders near the cut bank causes erosion and the low velocity, located in the insides of the meander, causes deposition. So if a river were to have meanders, there would be carving, or erosion, of the cut banks and deposition of sediments on the insides of the meanders, the point bars. Based on the data, the hypothesis was correct. According to the data, deposition of the sand accumulated in the insides of the meander as each 50mL of water was poured onto the rainmaker flowing through the meandering path; adding more sediments onto the point bars. Additionally, each time the 50mL of water was added onto the rainmaker, there was more carving and erosion of the cut banks that had occurred. Based on the research, this occurred due to the activities of the water speeds in that occur in the river. The high water velocity in the outsides of the meander led to the water carving the cut banks, which is an example of erosion. Another reason why the results had occurred the way they did is due to the low water velocity in

the insides of the meander causing deposition of sediments to occur on the point bars of the river and accumulate as each 50mL of water is added. One constraint for this investigation would be how packed the sediments of the sand were. If the sediments were really packed, the permeability of the sand could possibly decrease, causing the water to have less time to carve out the river path and/or to carry the sediments away. The water would just run off. Another limitation could be human error. It is possible that the amounts of water added were not always 50mL, or around, each time. This can lead to inaccurate results.