

Floodplains



A **floodplain** is the flat land immediately surrounding a stream channel and innundated at times of high flow.



Aggradation occurs when deposition is greater than erosion.



Aggradation of the Rivière des Ha! Ha! in Quebec

Incision occurs when erosion is greater than deposition.

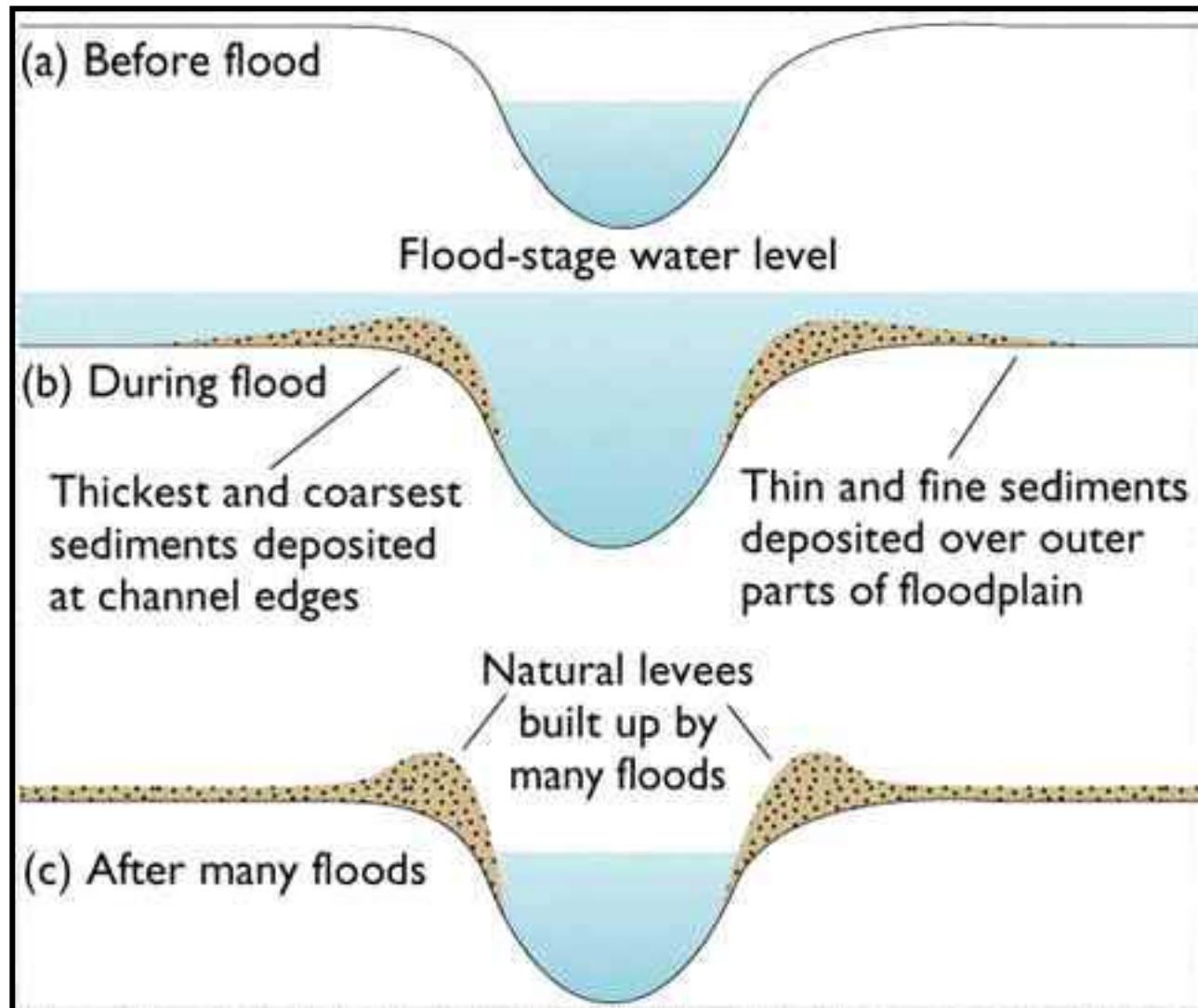


**Broadstreet Hollow
Stream, NY**

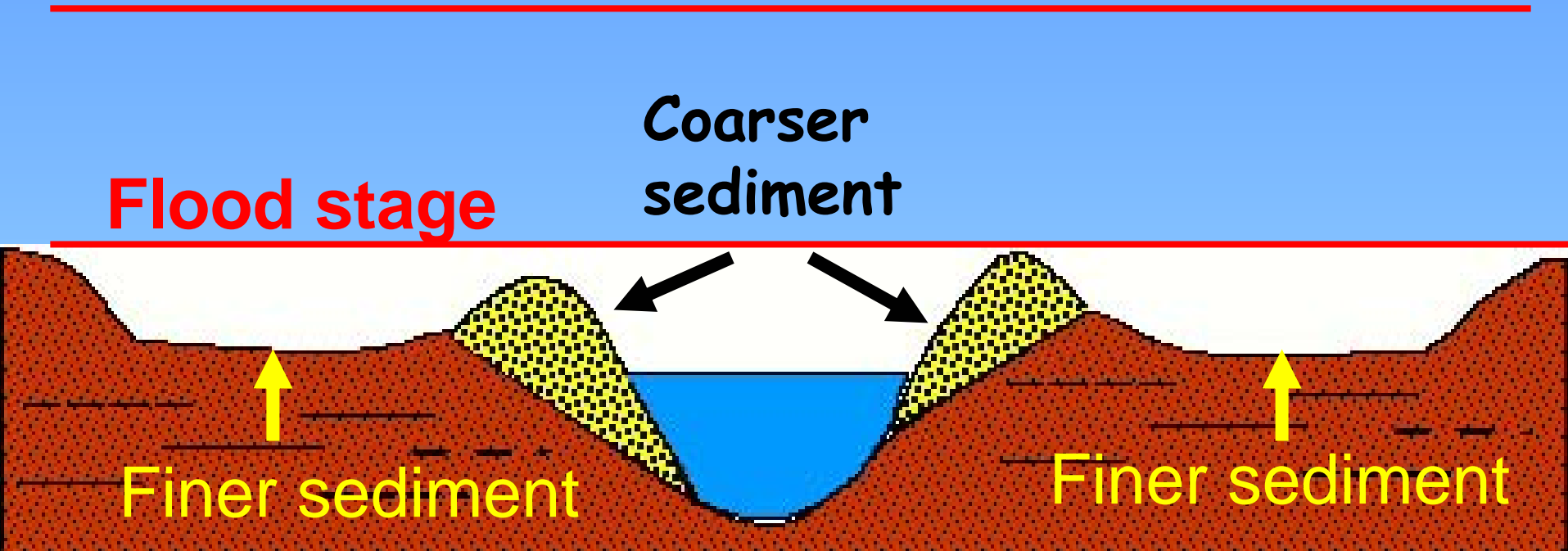
Floodplains can form either by deposition of overbank suspended sediment or by deposition of bedload as the channel migrates across its valley.



Flooding & Sedimentation



Levee Deposits



The area adjacent to and outside of the channel serves as an overflow area for excess water and sediment

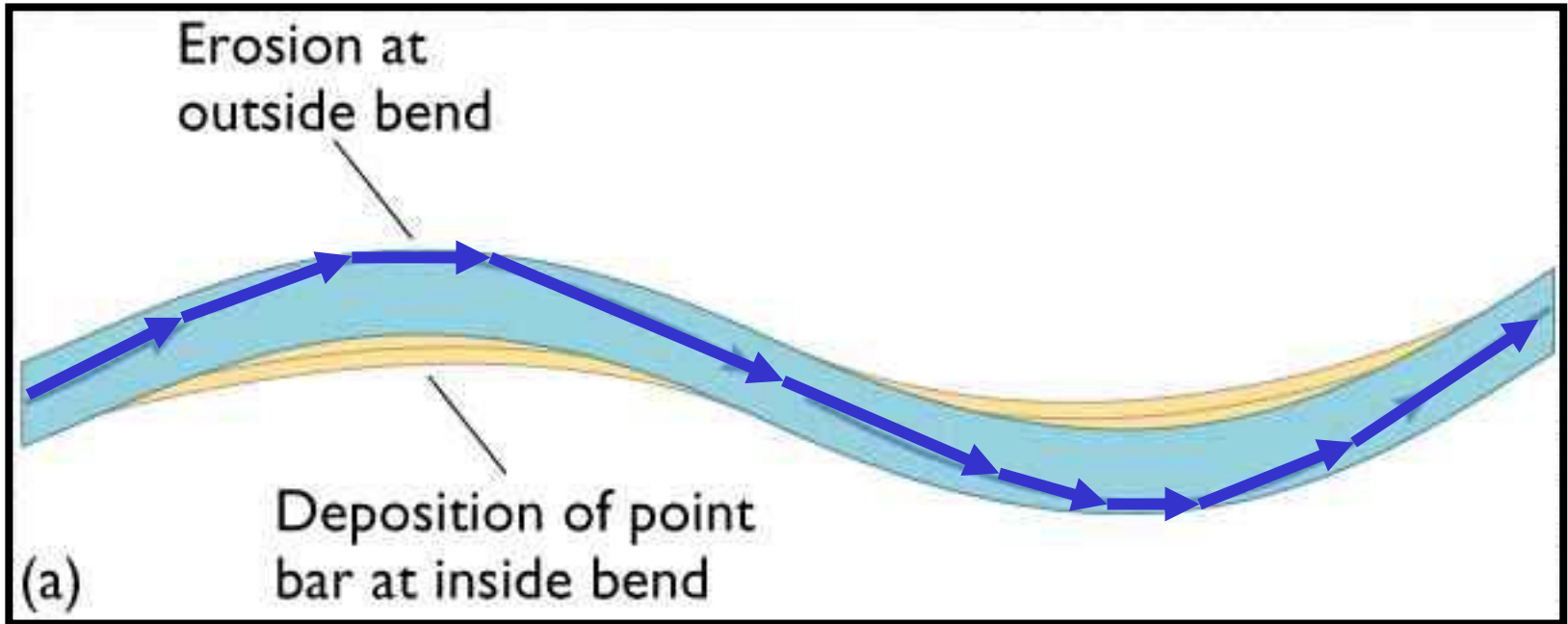
Levees

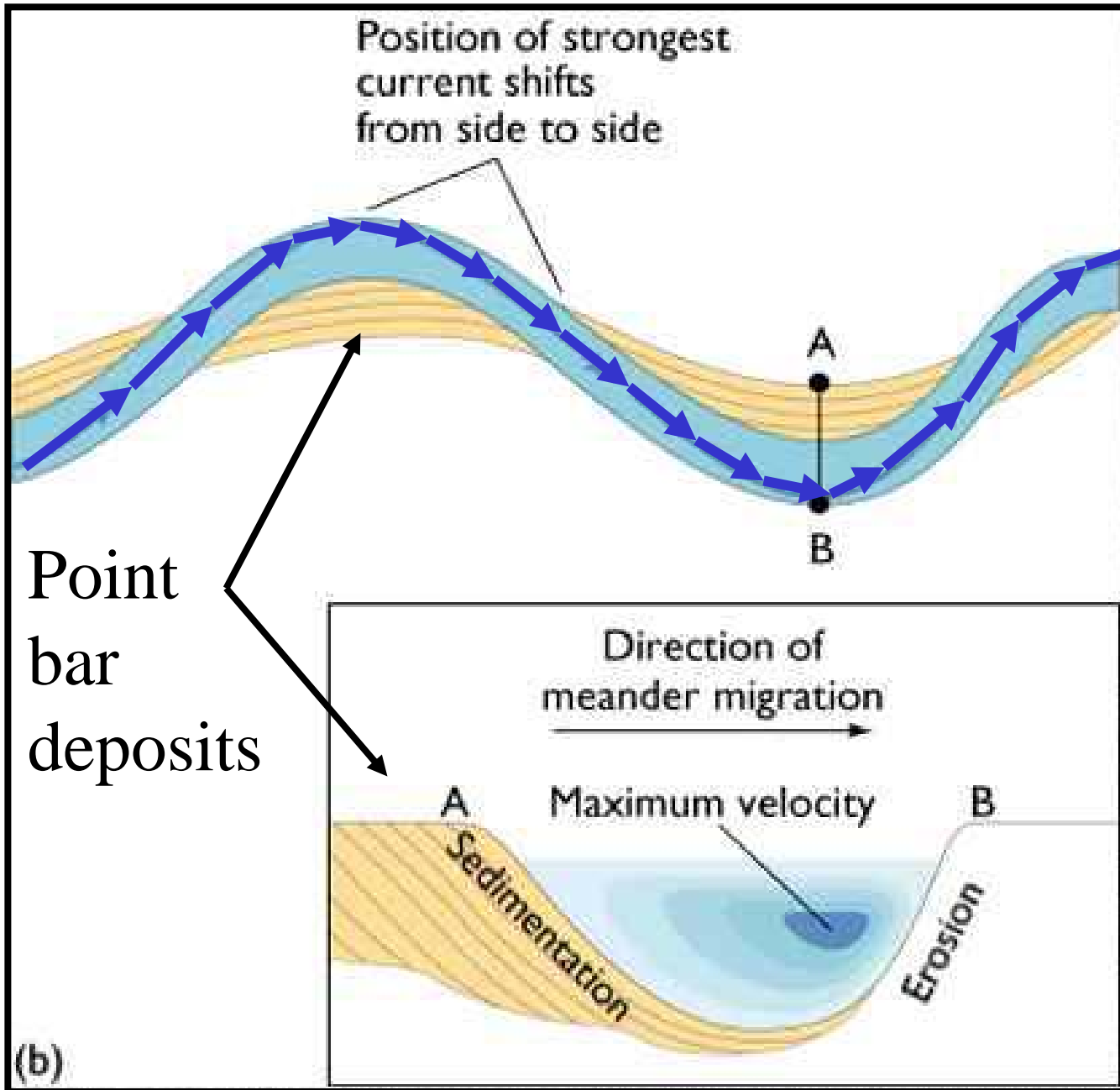
The boundary between channel and floodplain may be the site of a **natural levee** (a broad, low ridge of alluvium built along the side of a channel by debris-laden floodwater).

Levees form when debris-laden floodwater overflows the channel and slows as it moves onto the floodplain.

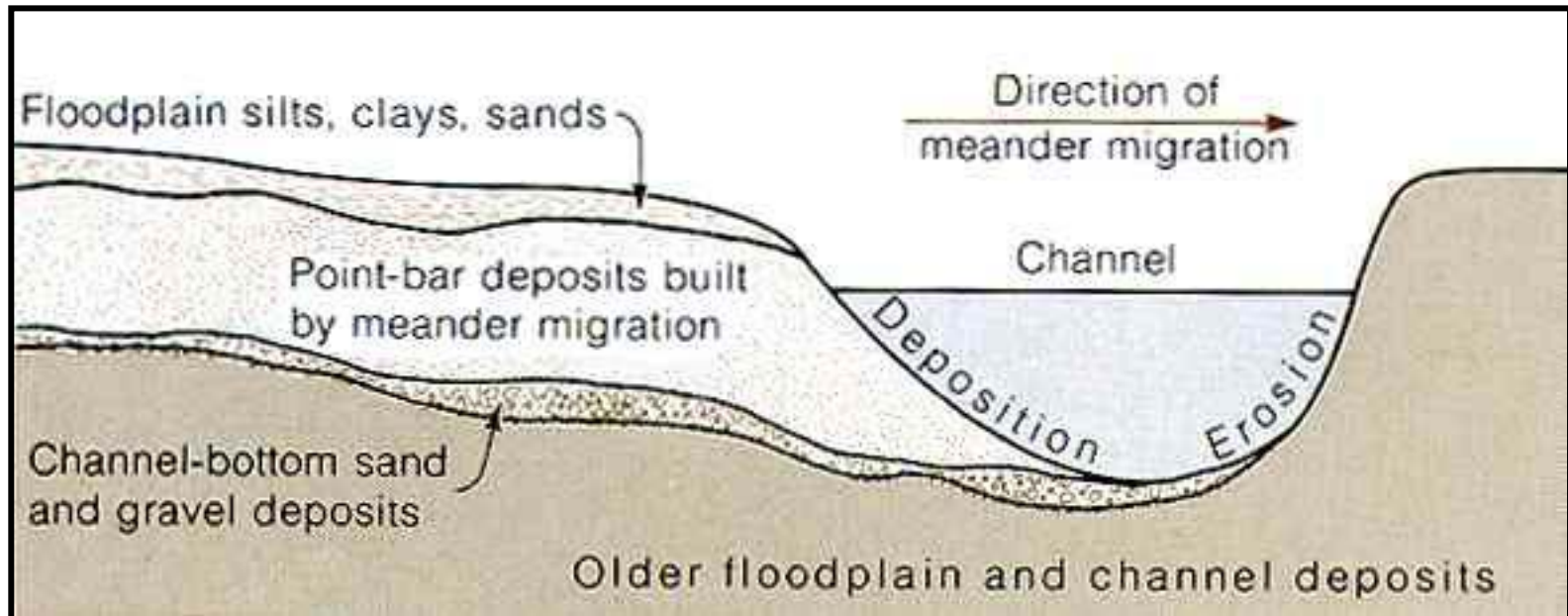


Formation of Meanders

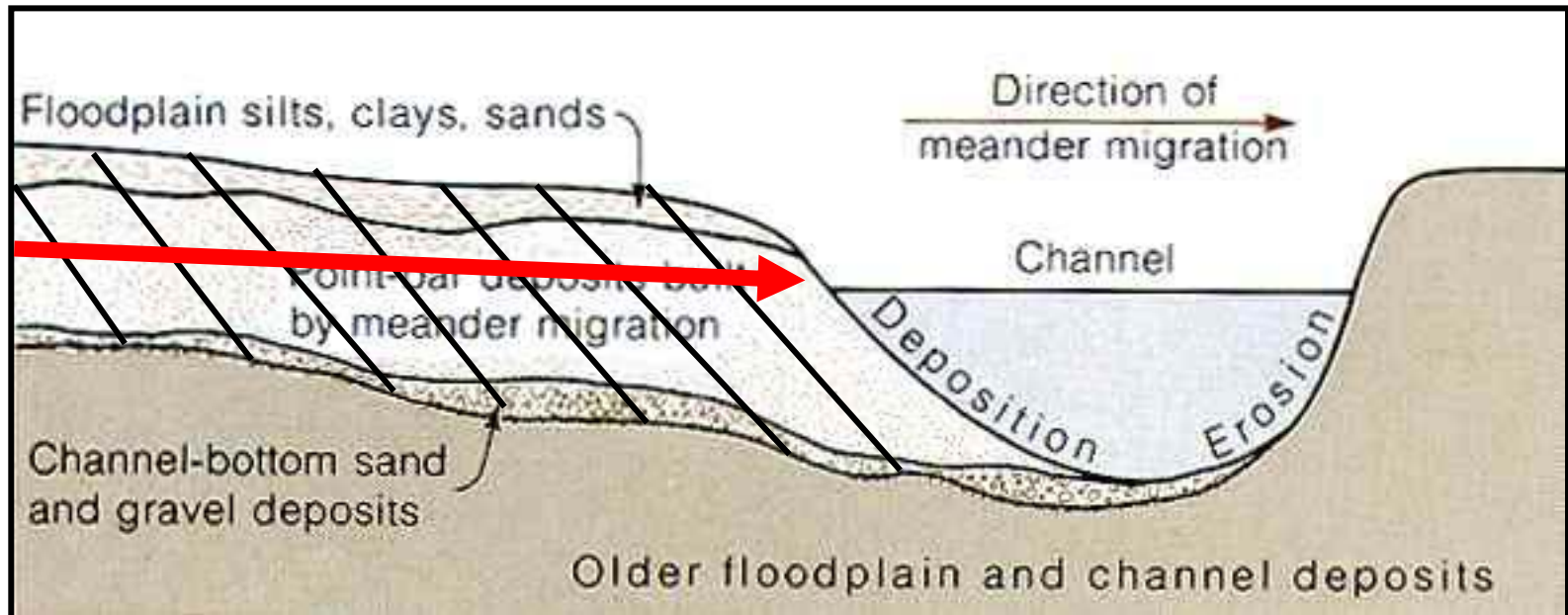




Point Bar Deposits

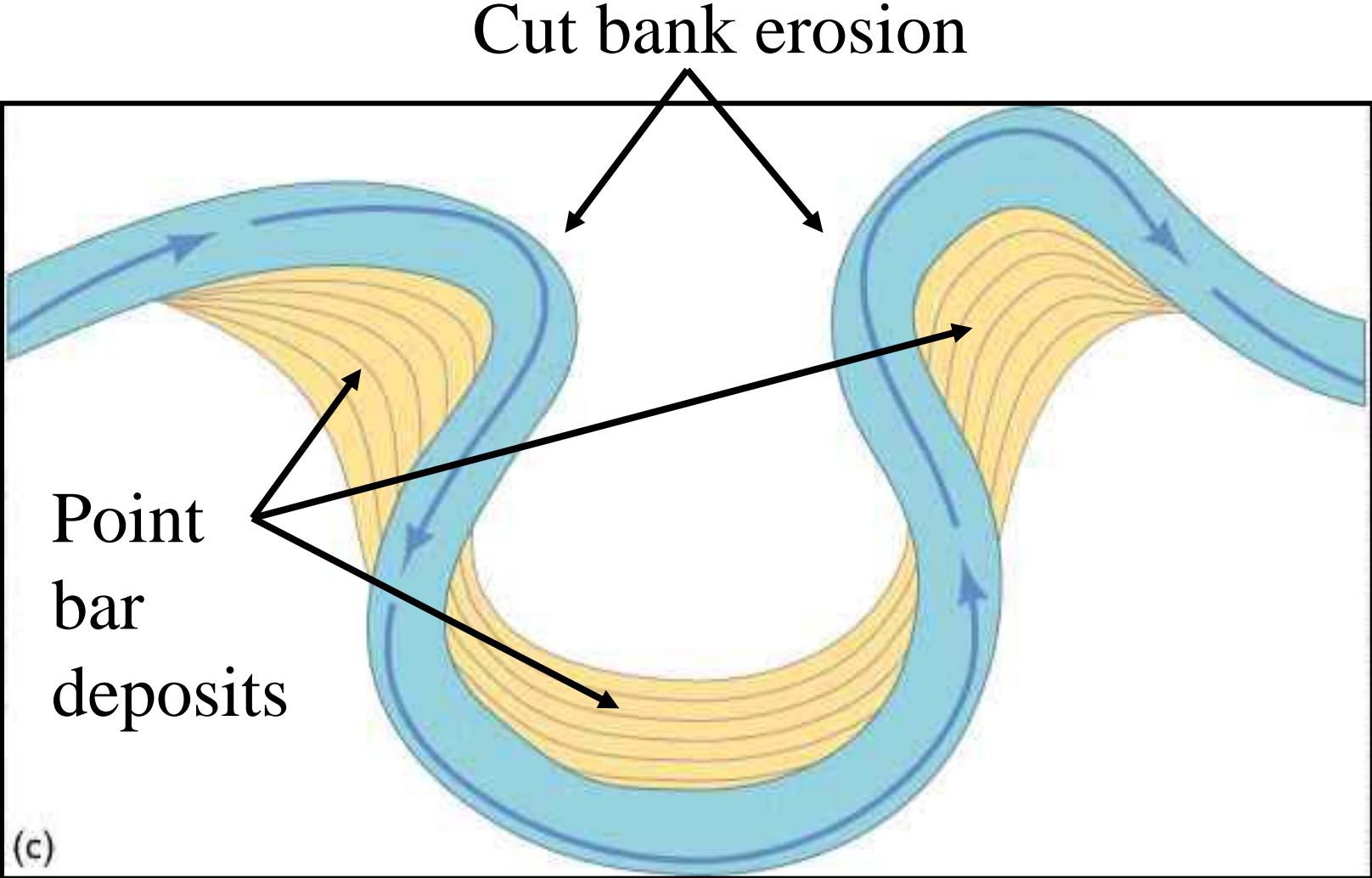


Point Bar Deposits

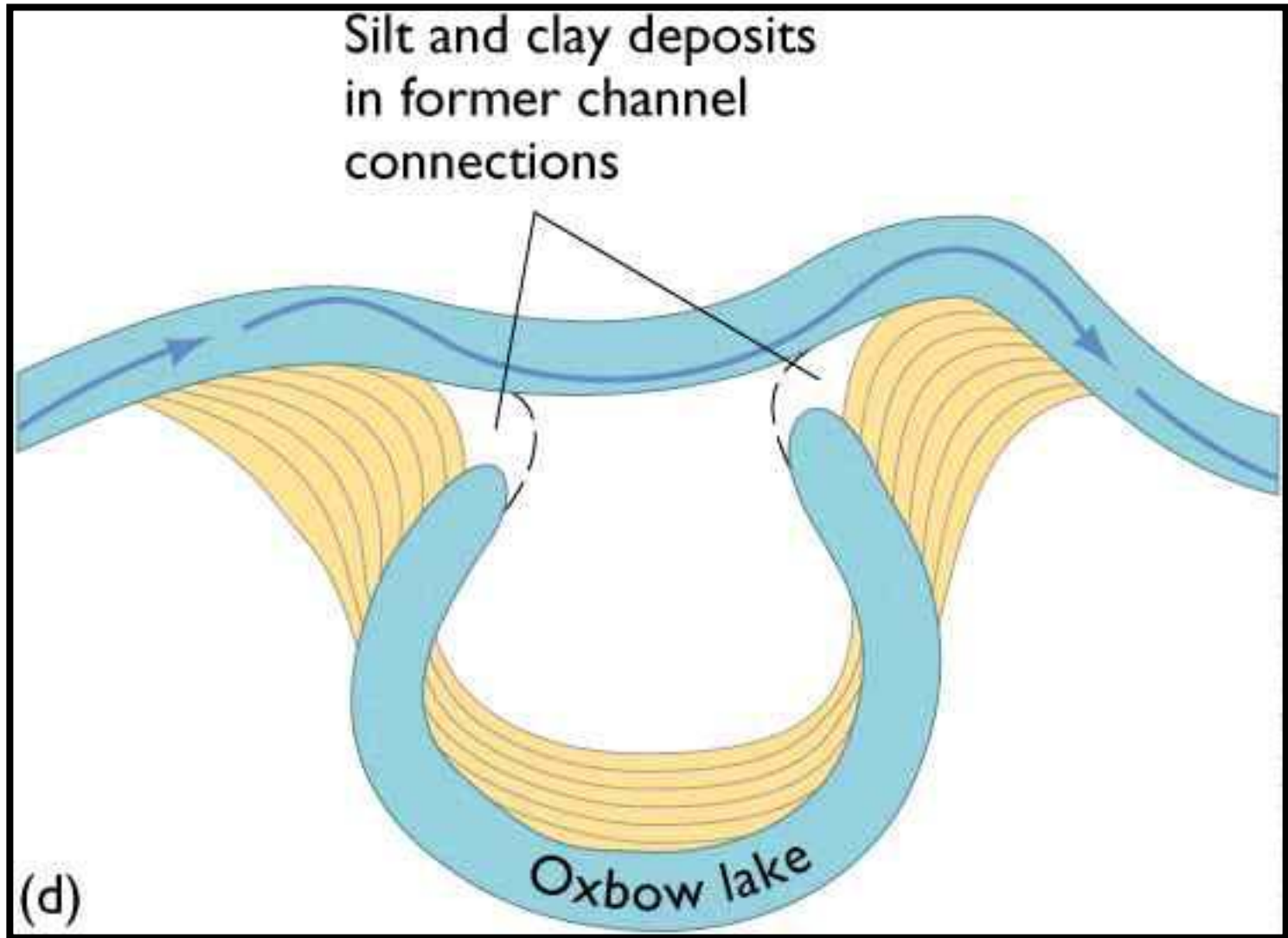


Point bar deposit grows laterally through time

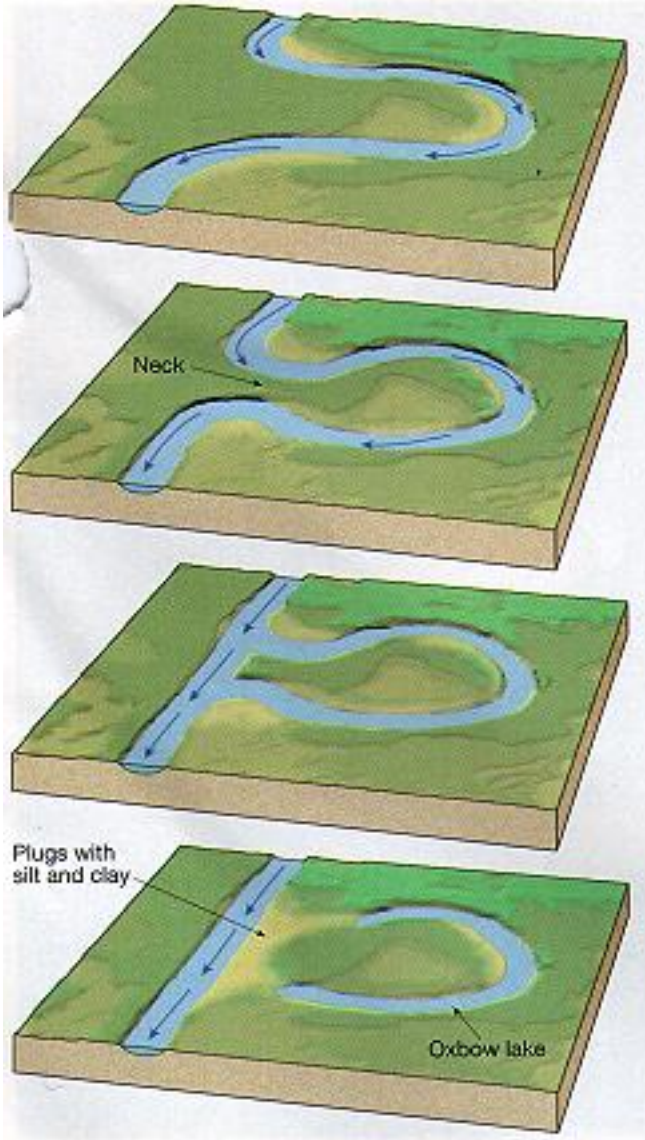
Point Bar Deposits



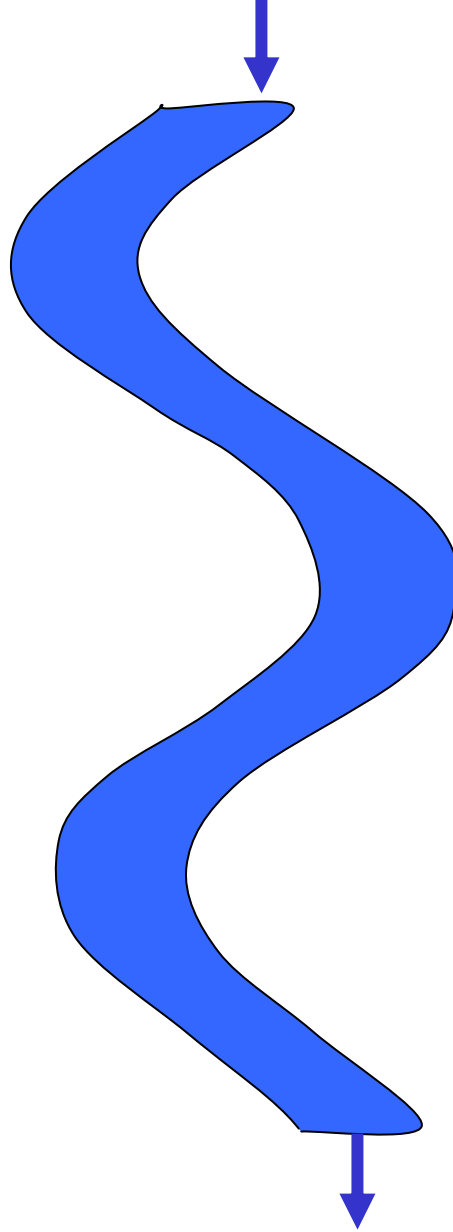
Oxbow Formation

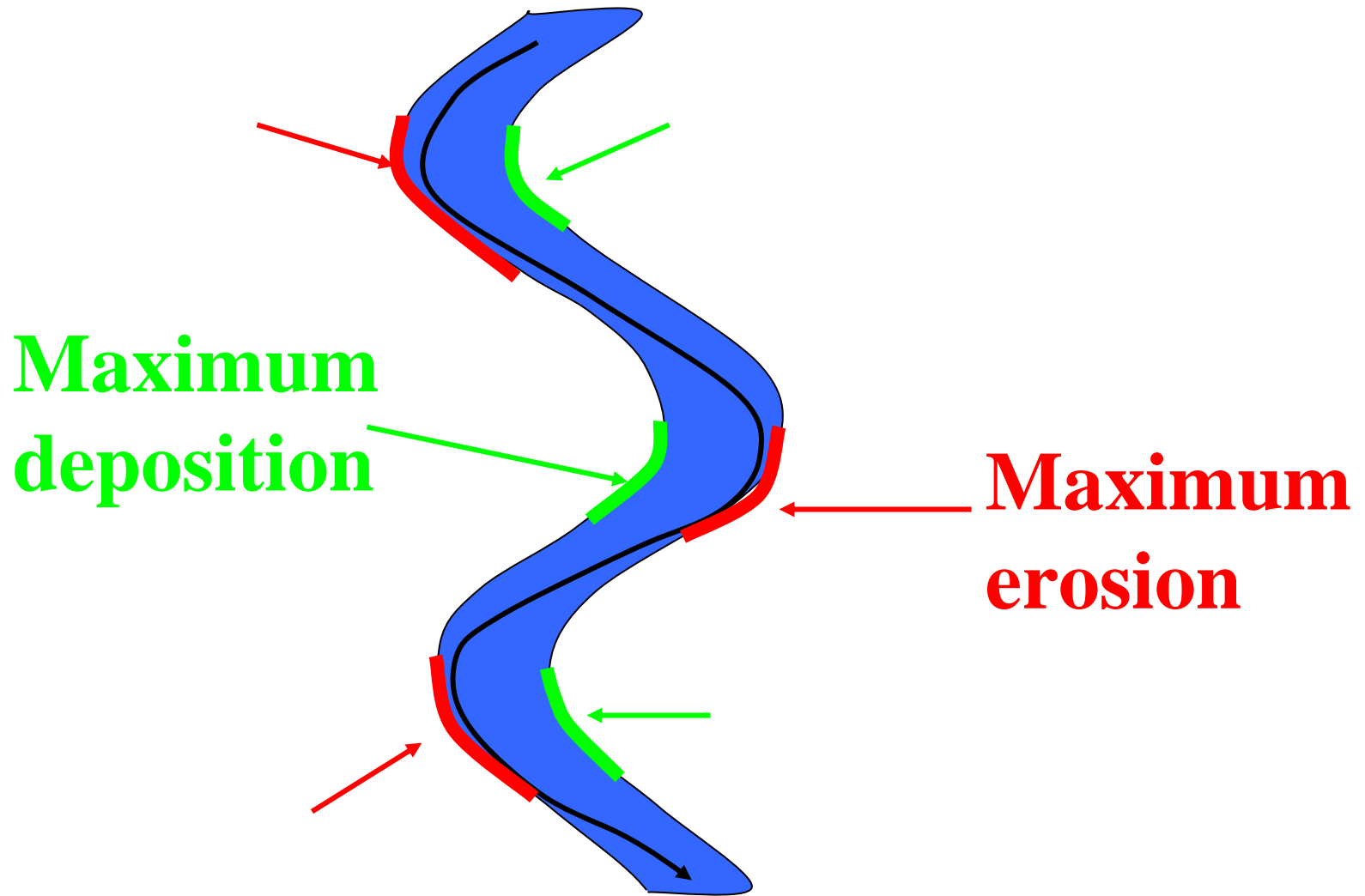


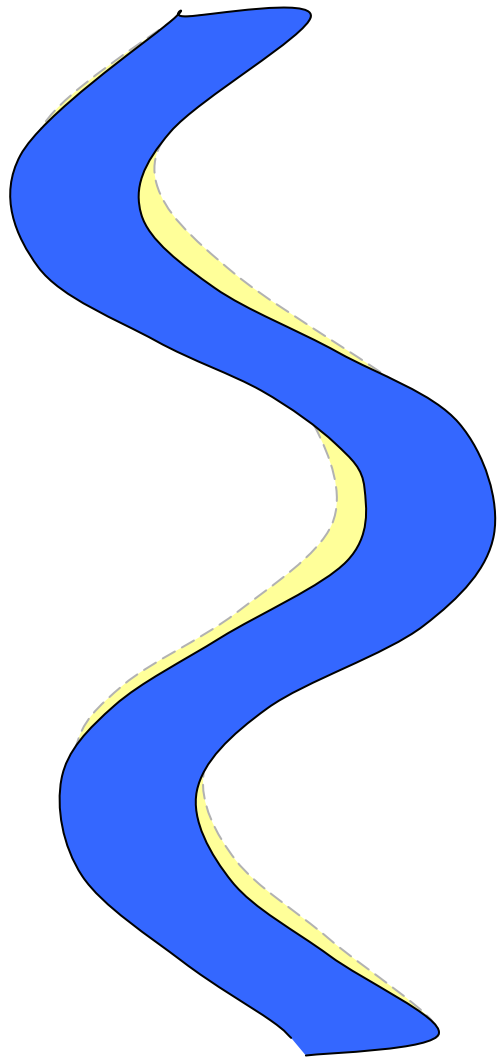
Oxbow channels

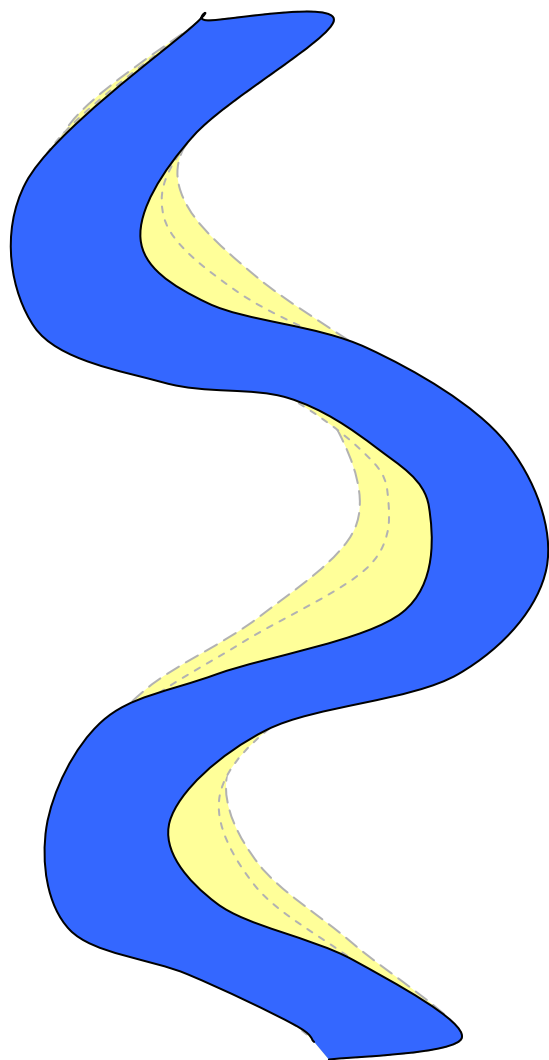


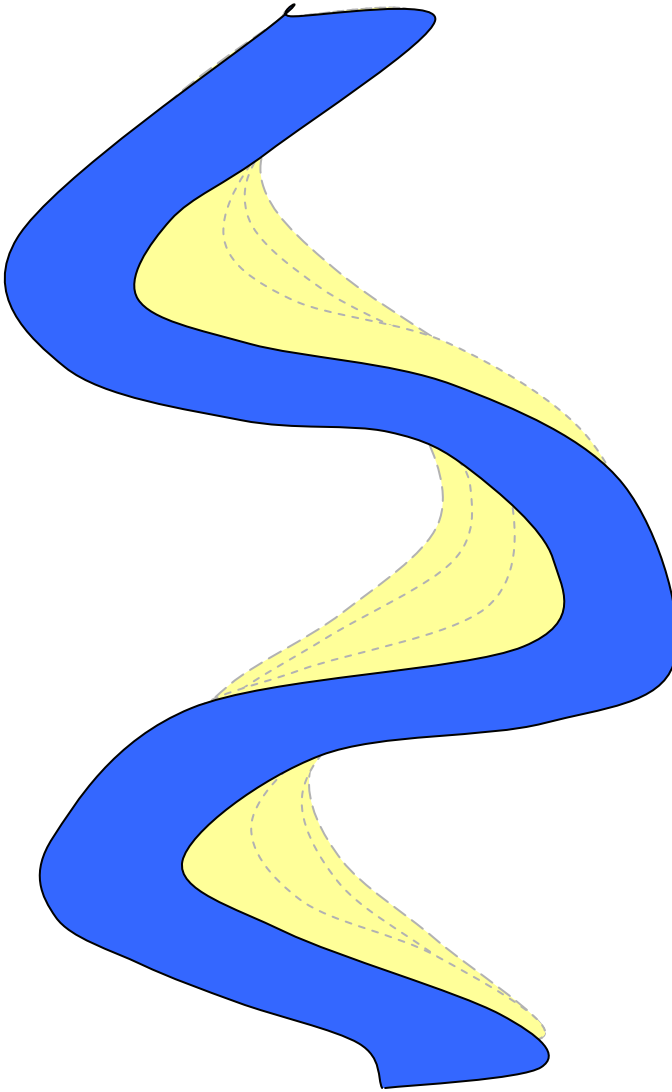
Meandering stream
flowing from
top of screen
to bottom

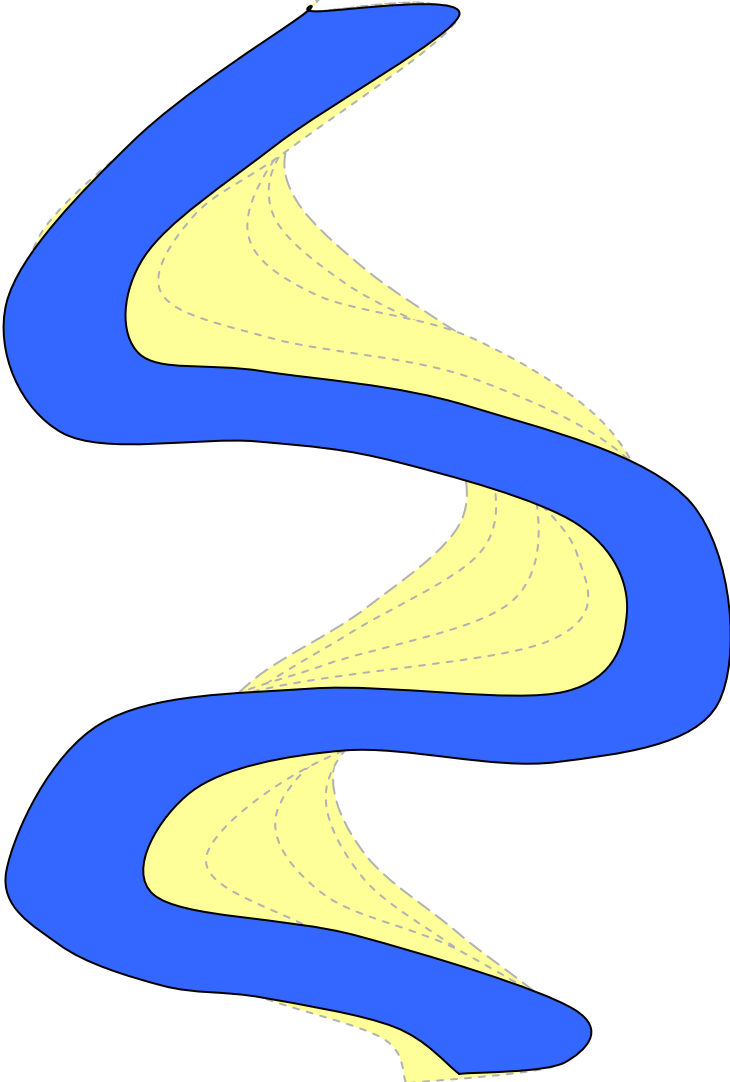


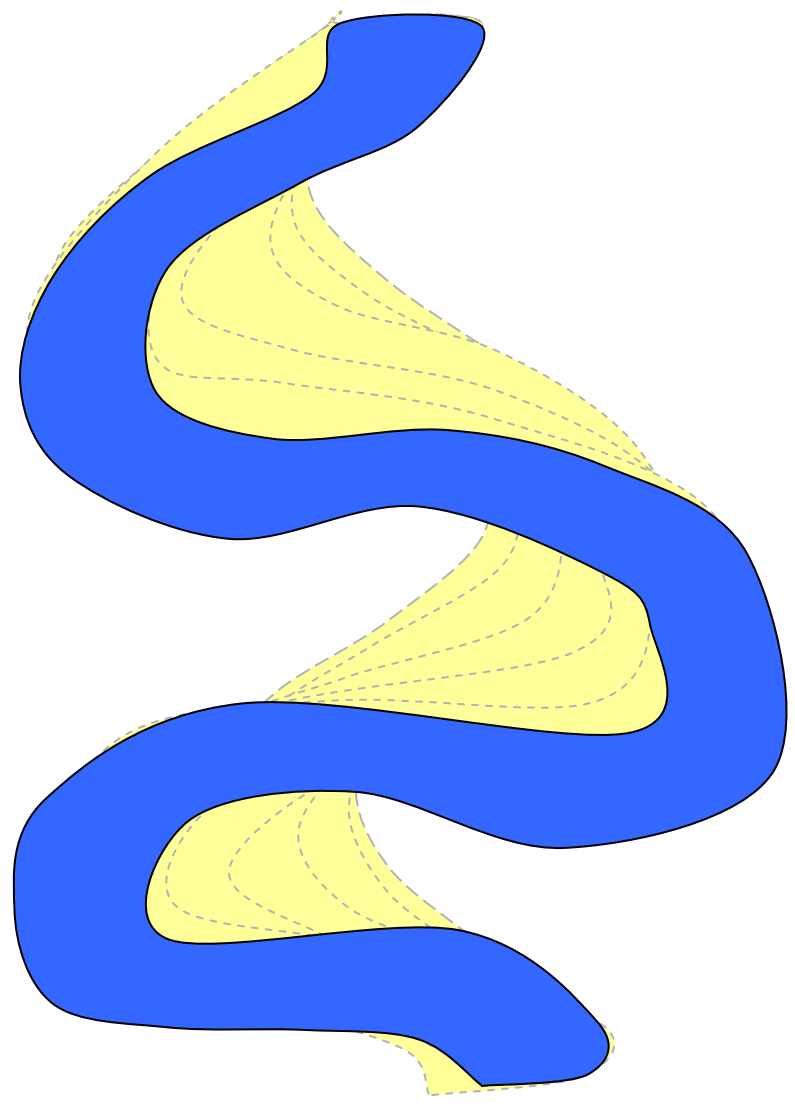


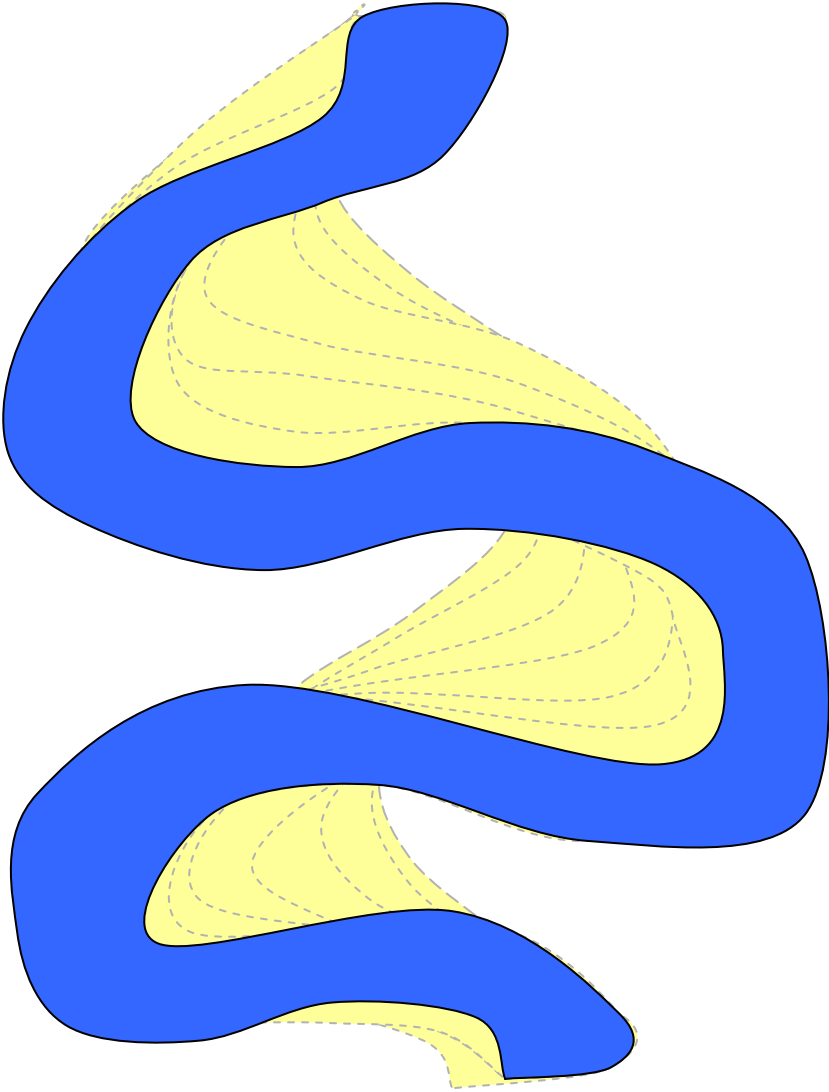


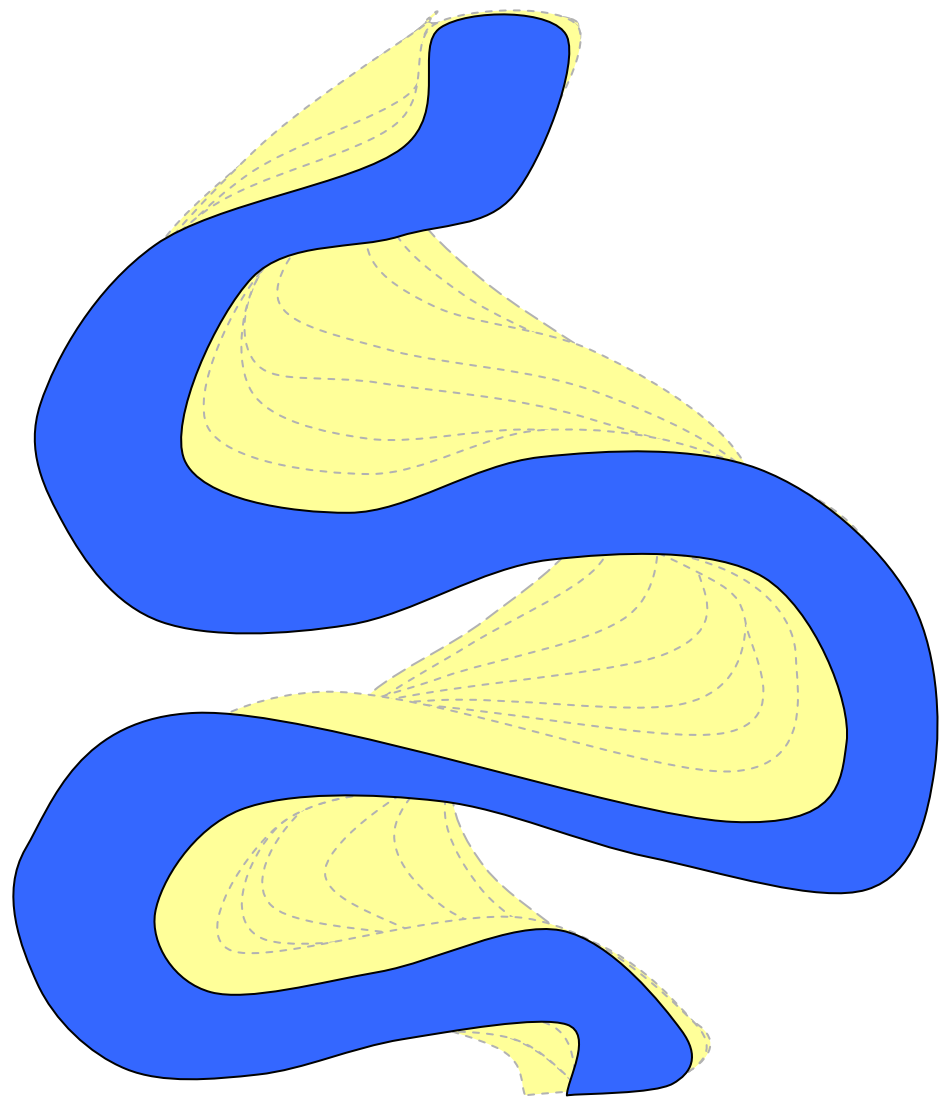


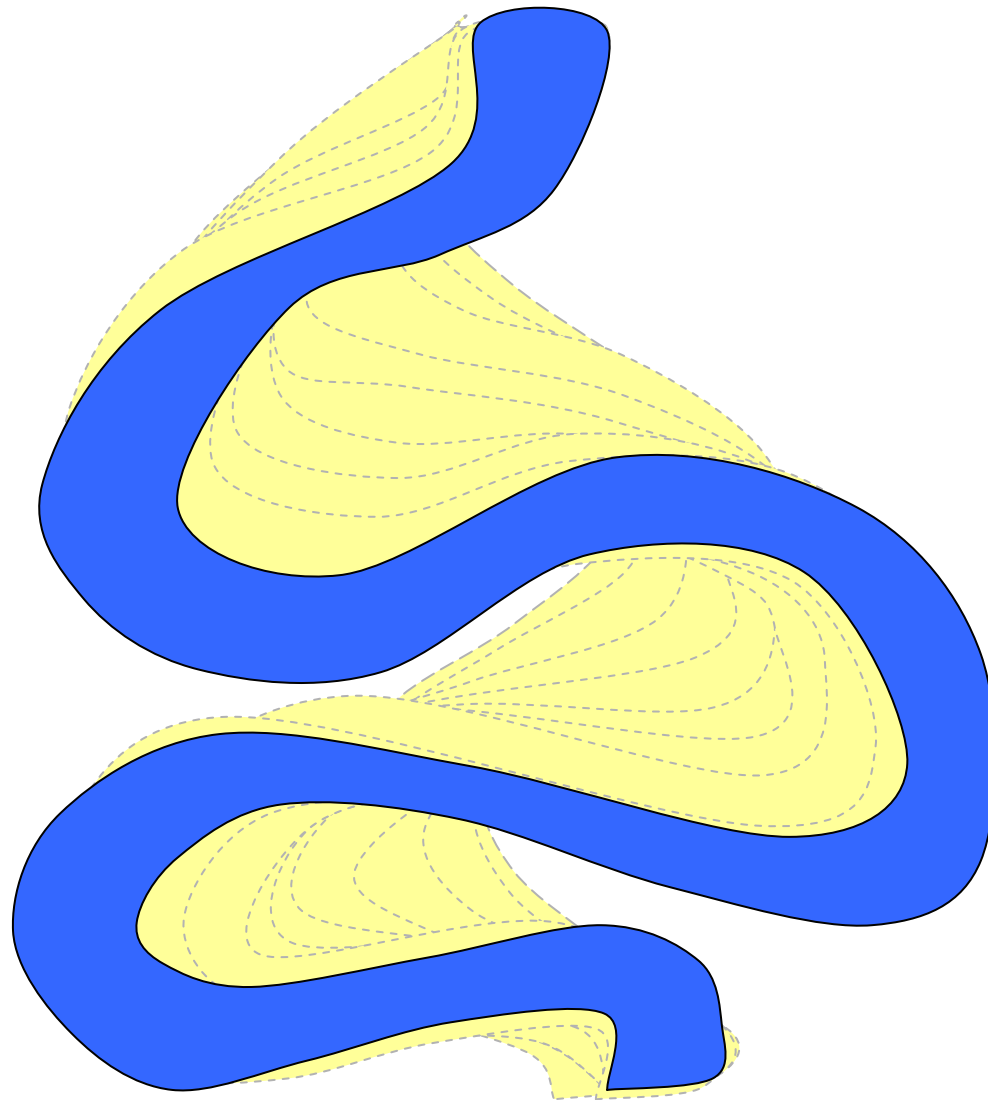


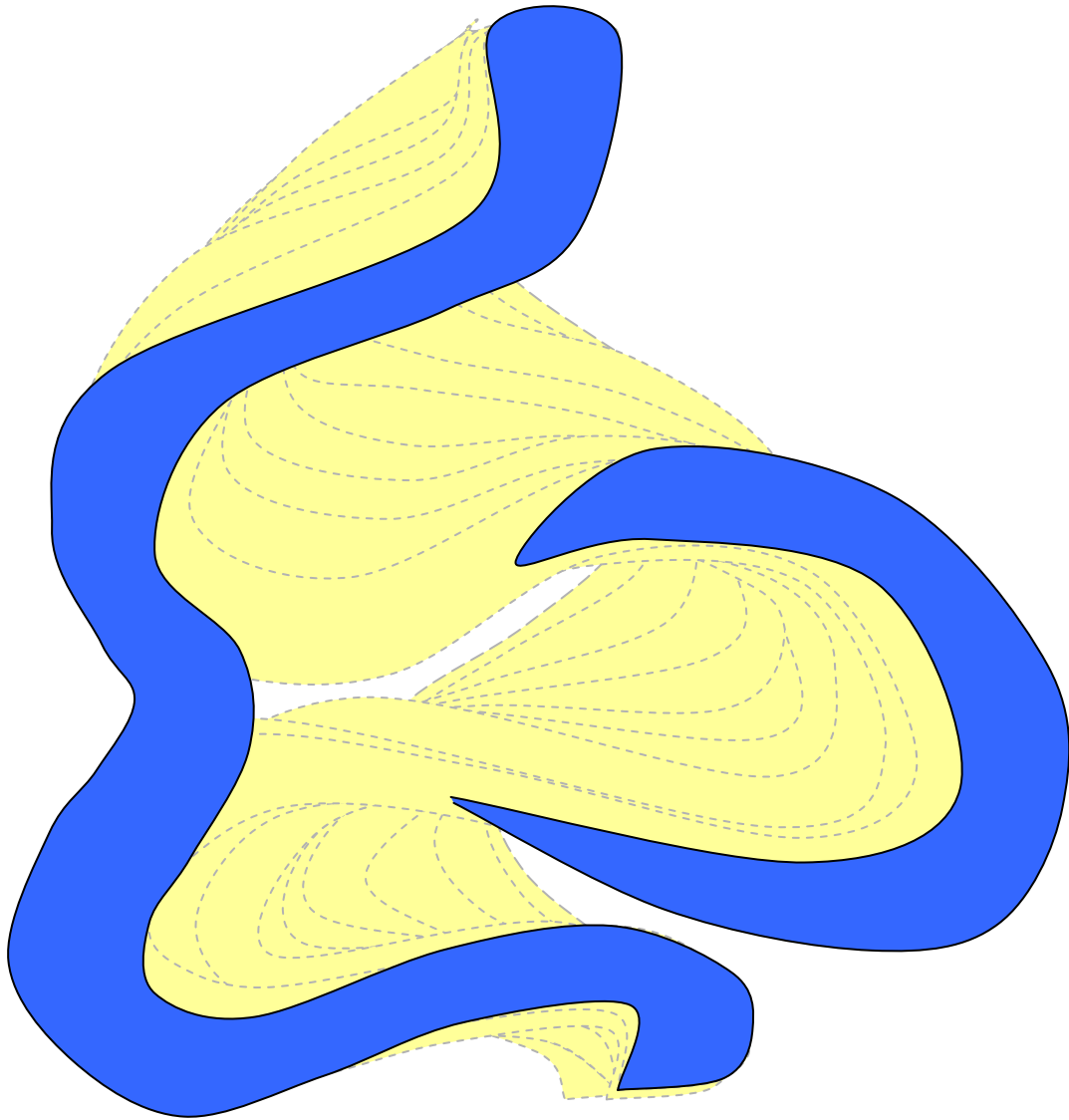


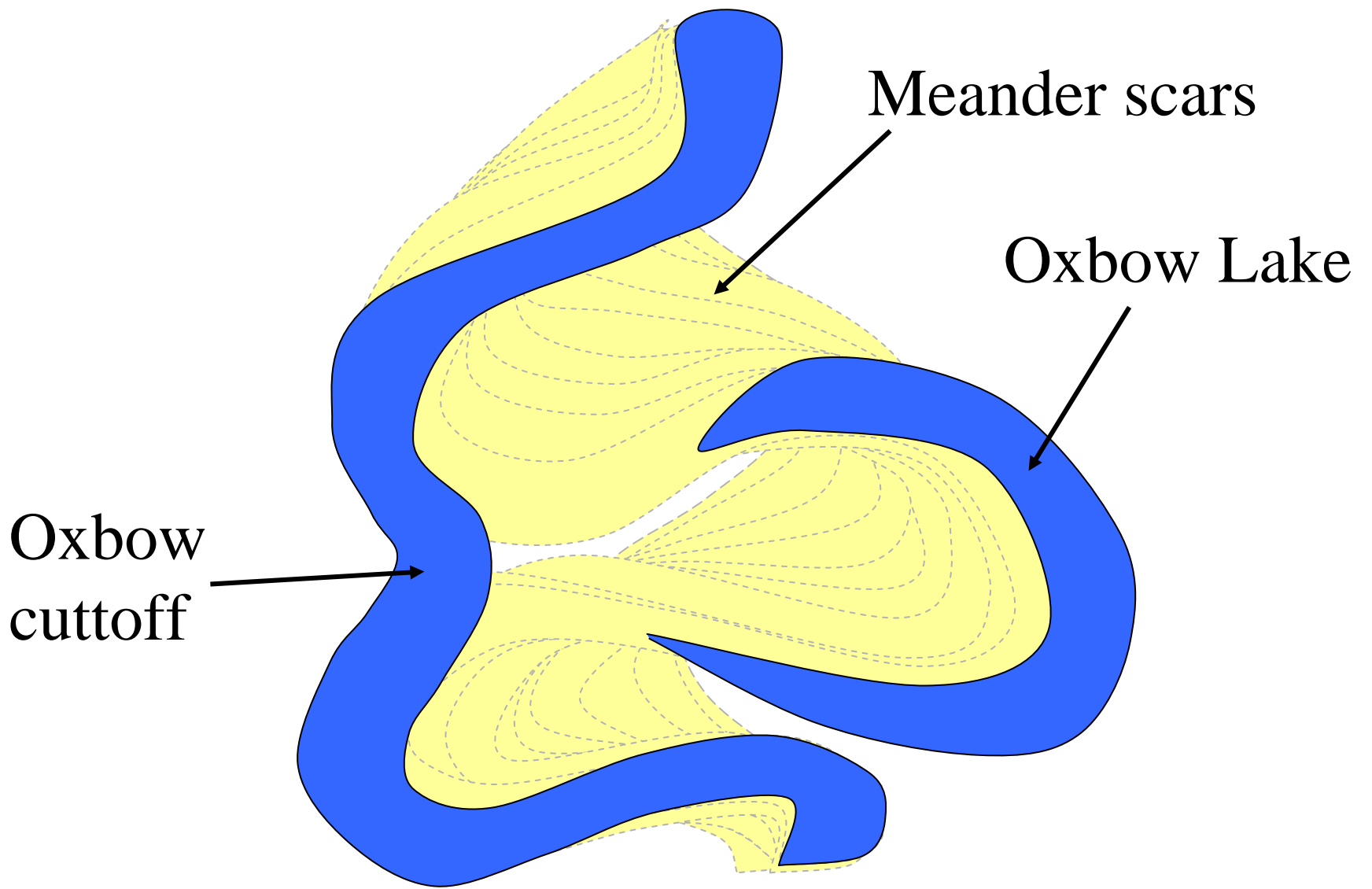




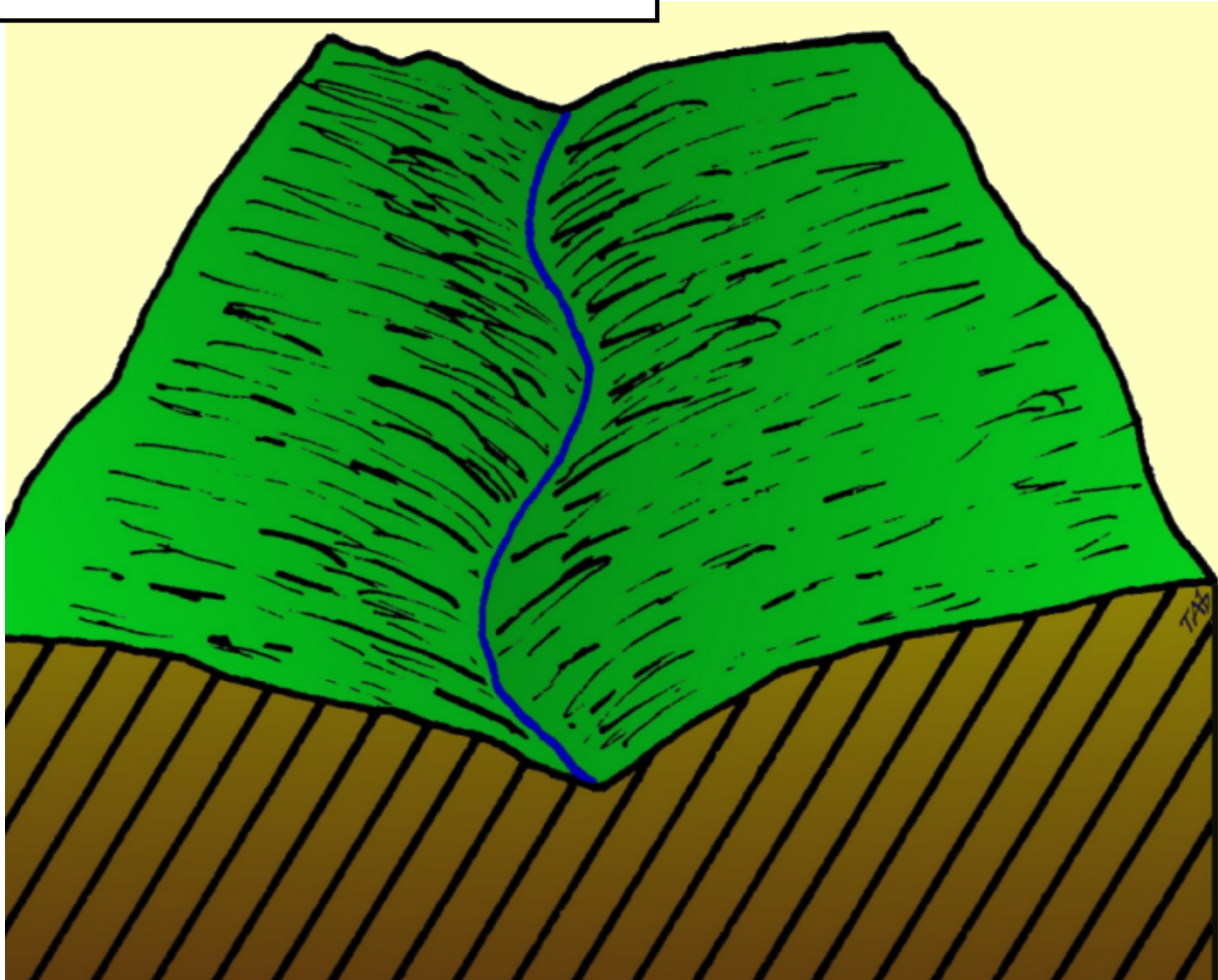




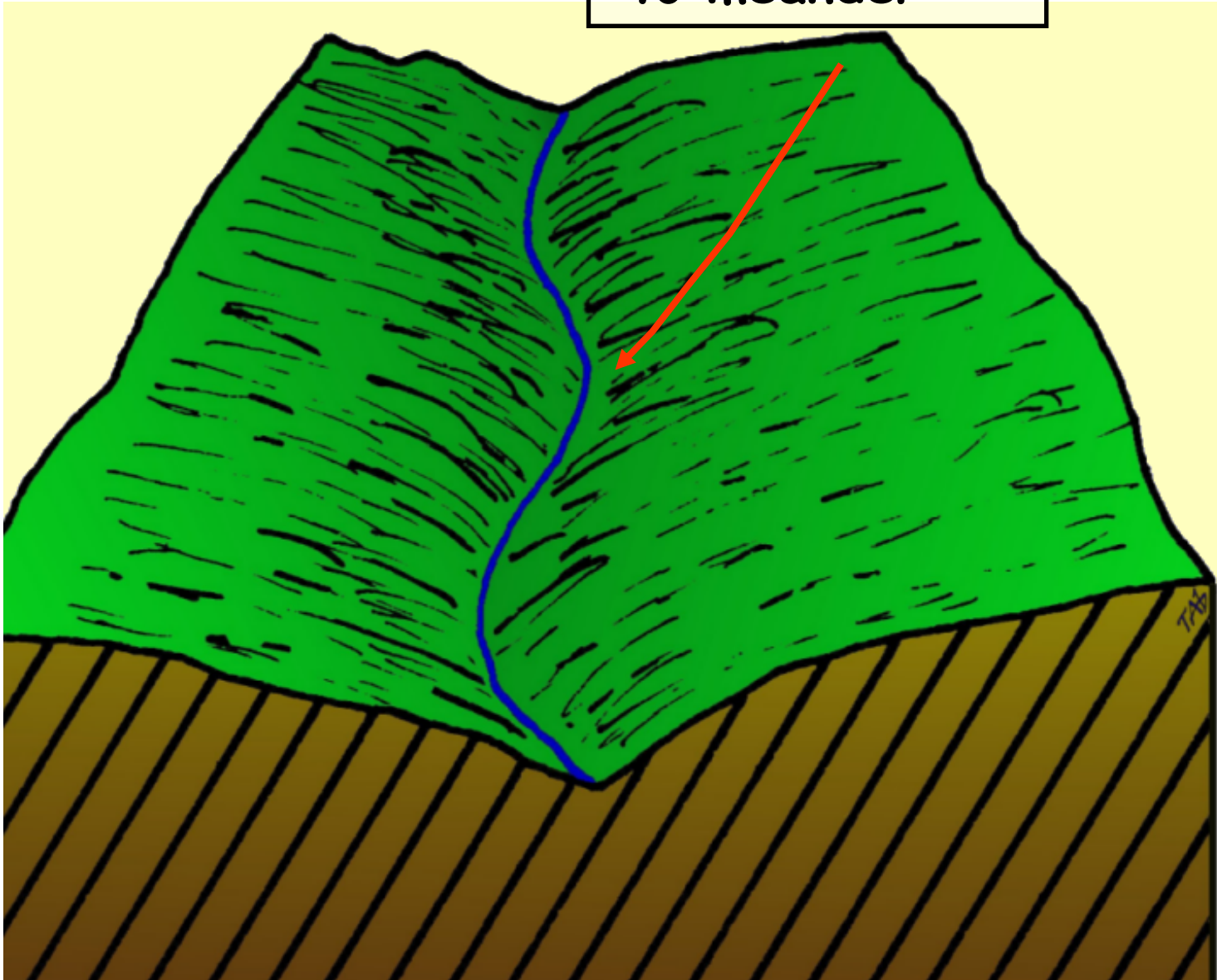




The river cuts downward to form a 'V'-shaped valley.

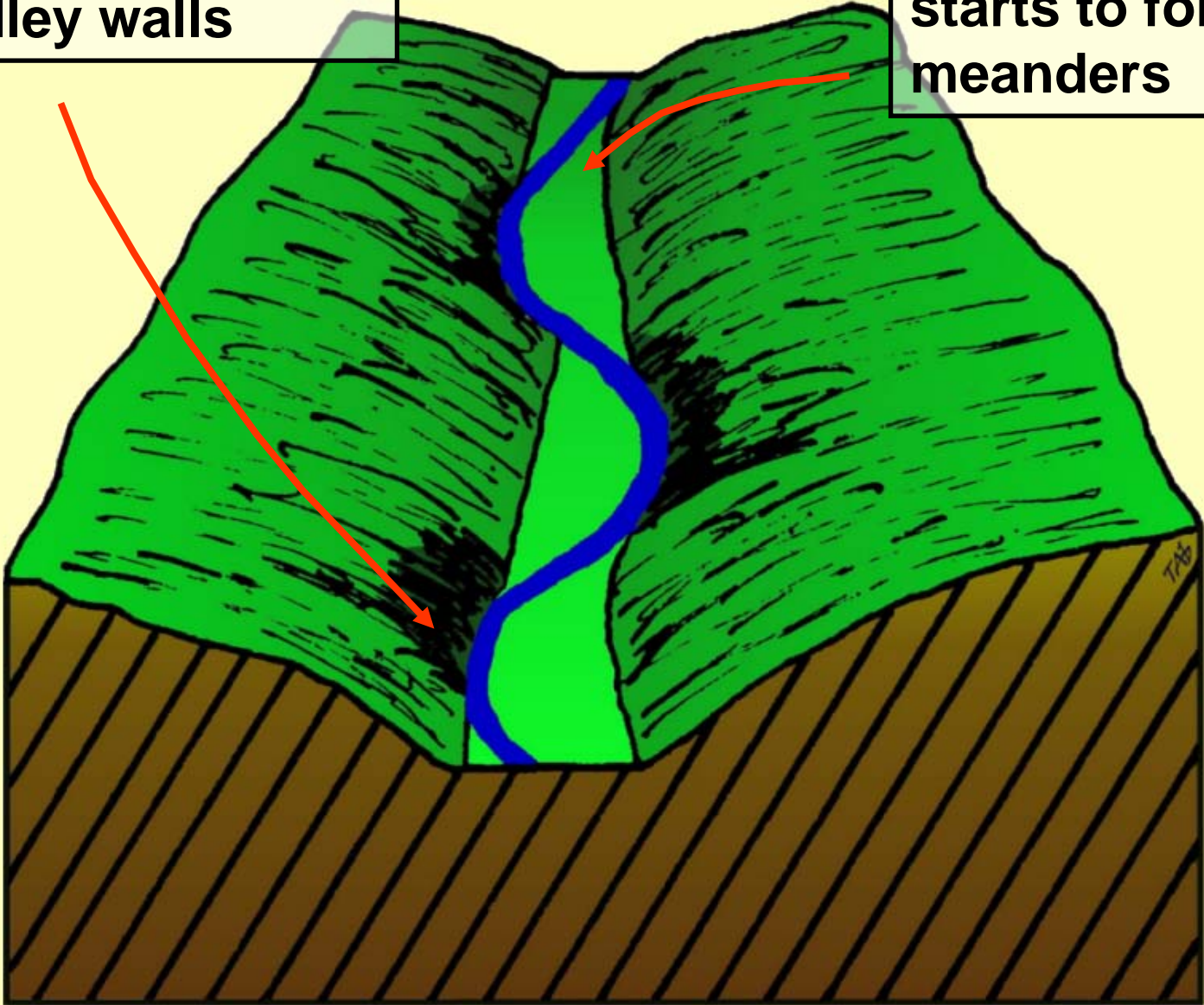


The river starts to meander

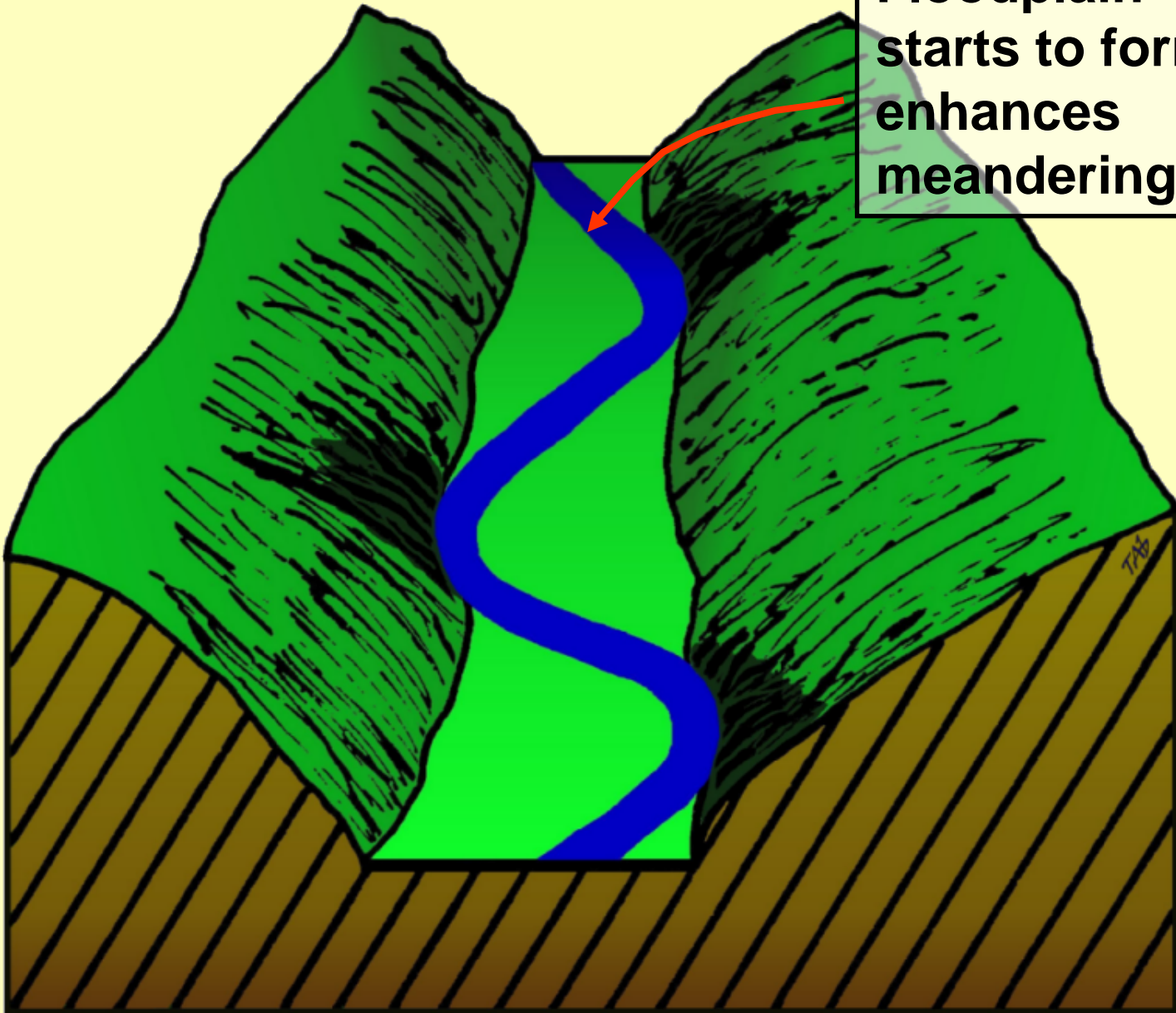


River cuts from side to side eating into the valley walls

Floodplain starts to form meanders

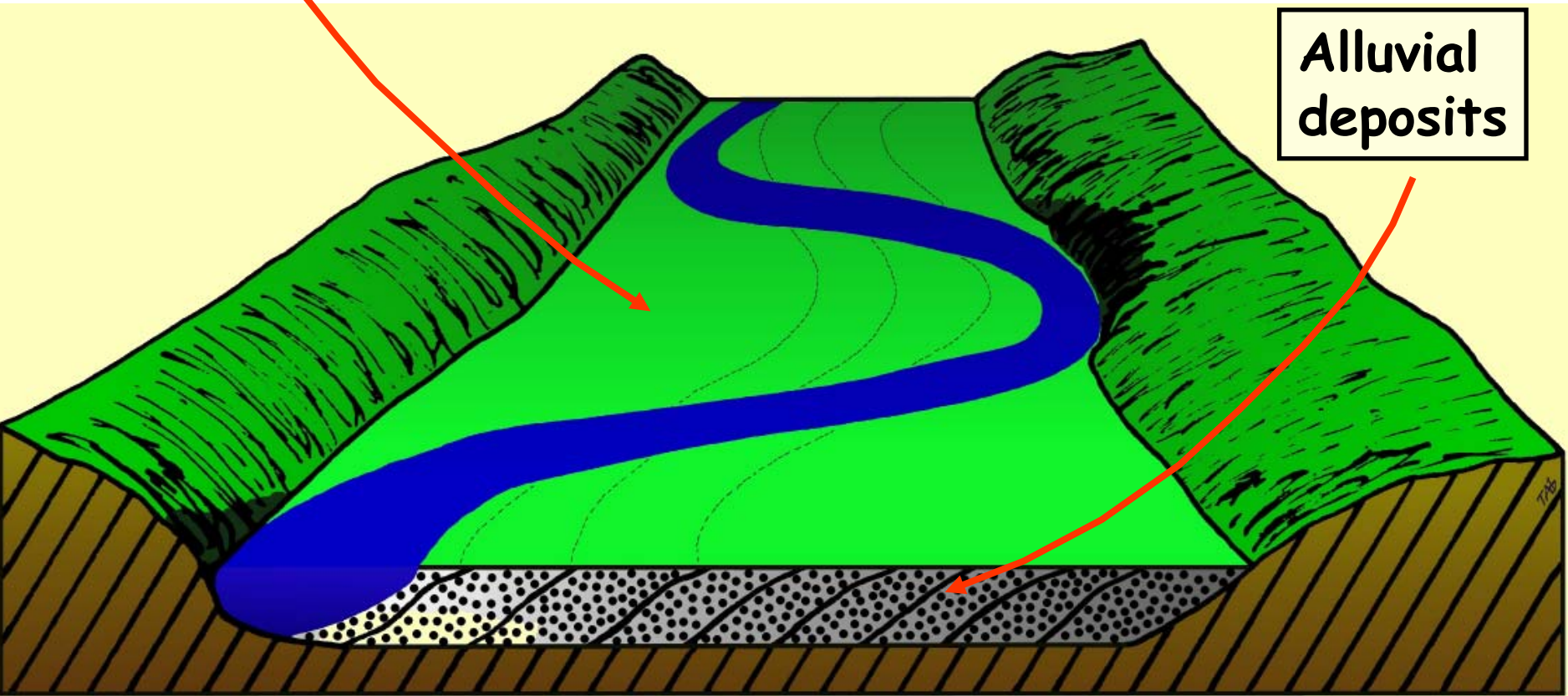


**Floodplain
starts to form,
enhances
meandering**

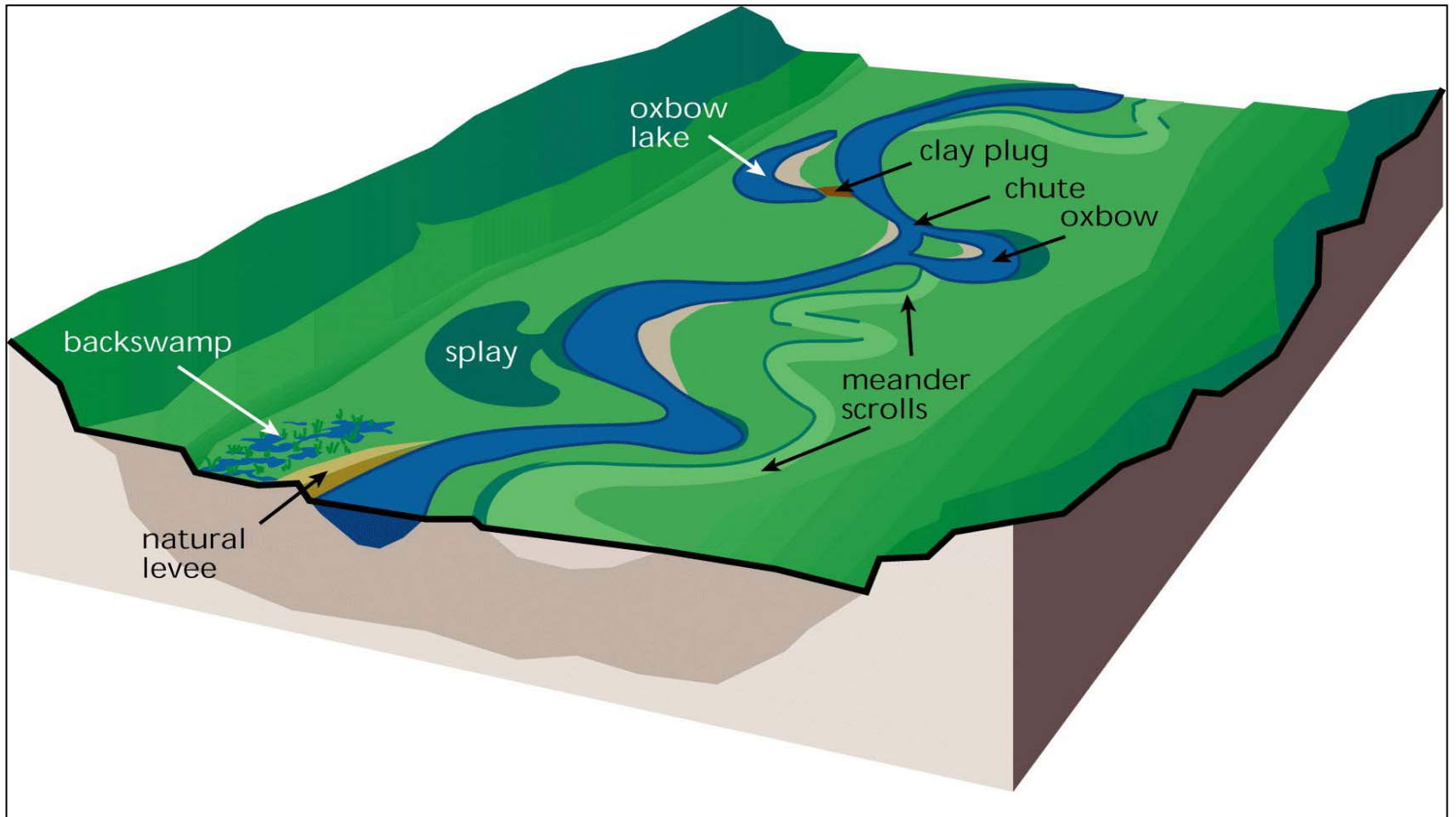


Floodplain

Alluvial deposits

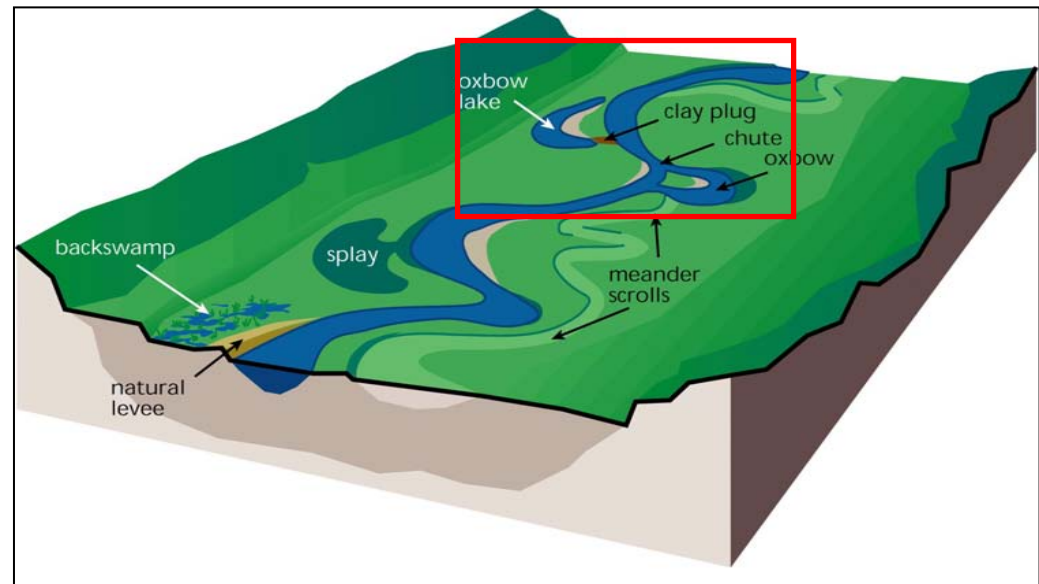


Floodplain landforms



Oxbow lake

A crescent-shaped lake formed in an abandoned river bend which has become separated from the main stream by a change in the course of the river.

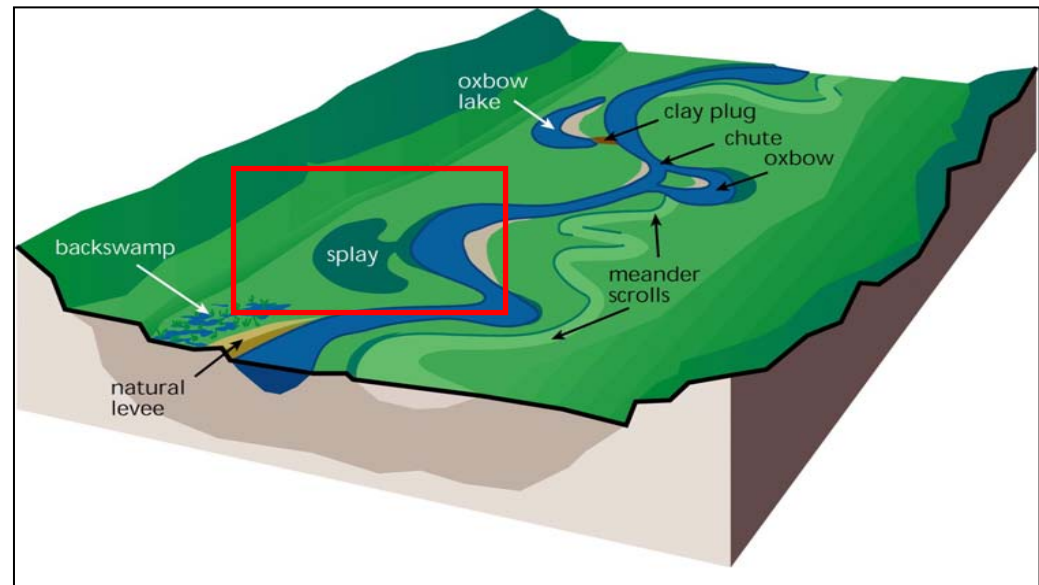


Oxbow lake near the Chippewa River, Eau Claire, Wisconsin



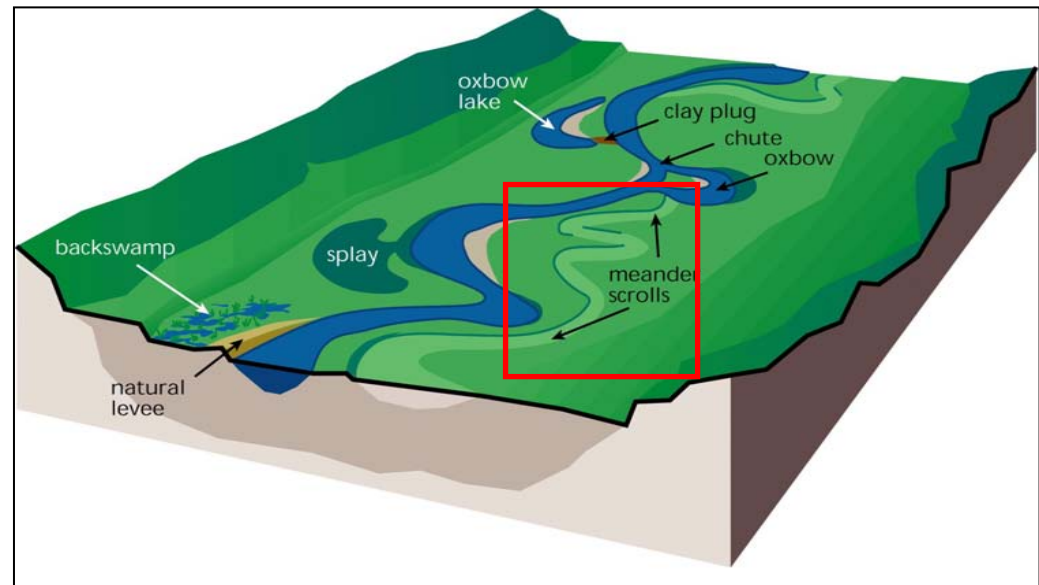
Splay

A deposit of coarse material resulting from a levee breach during a flood.



Meander scroll

A meander scroll consists of long, curving, parallel ridges (scrolls) that during stages of high water have been aggraded against the inner bank of the meandering channel, while the opposite bank experienced erosion.

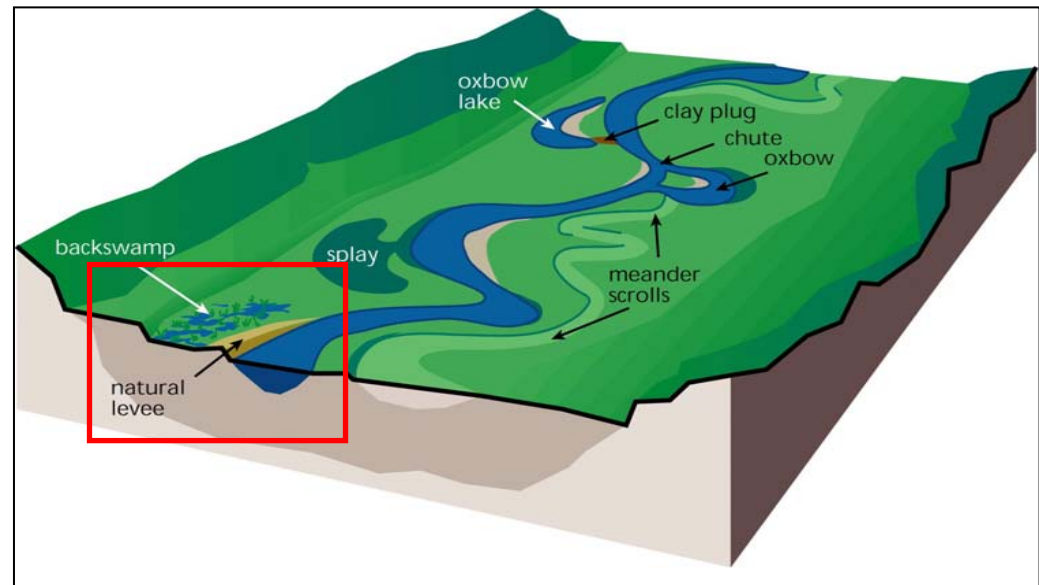


Side looking radar (SLAR) image of floodplain of an Amazon River tributary in 1971/2; flow is toward lower right.



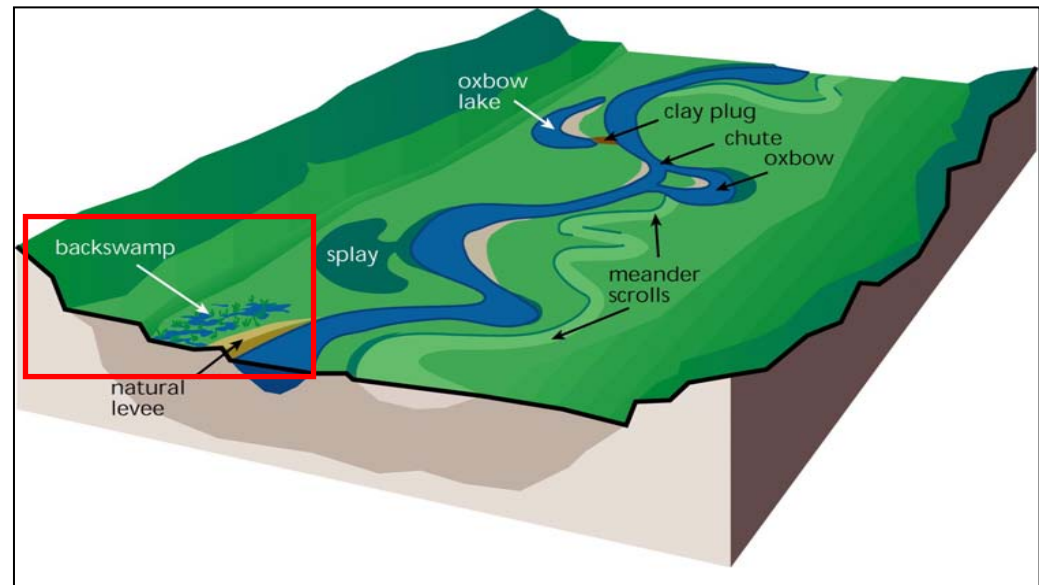
Natural levee

A bank confining a stream channel or limiting areas subject to flooding.



Backswamp

A low area of swampy ground beyond a river's natural levees.

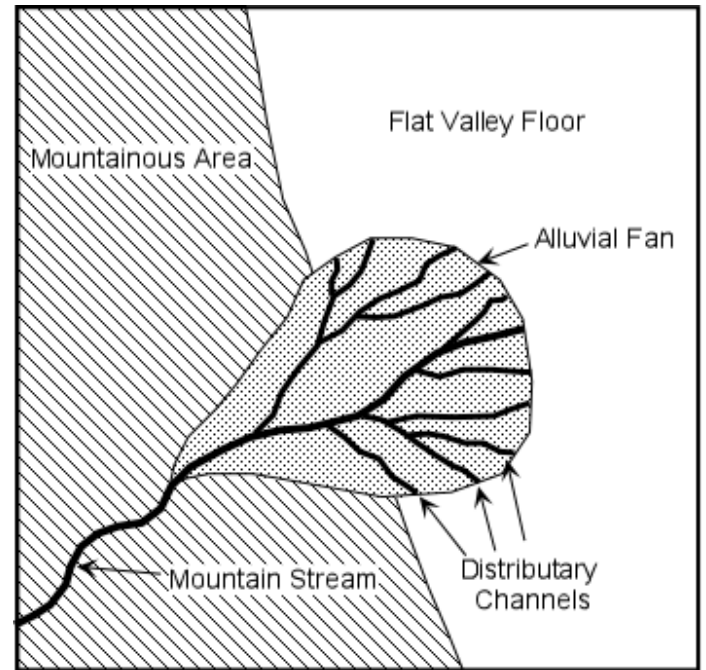


Alluvial Fans

When streams encounter a sudden change in gradient, e.g. leaving mountains, they deposit **alluvial fans**.



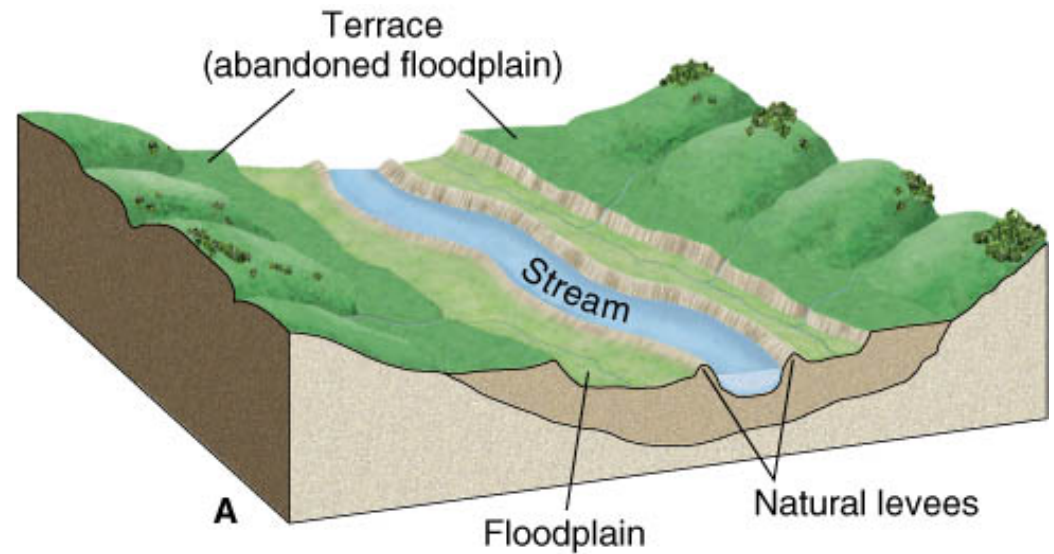
Alluvial fans tend to be coarse-grained at their head. At their edges, however, they can be relatively fine-grained.



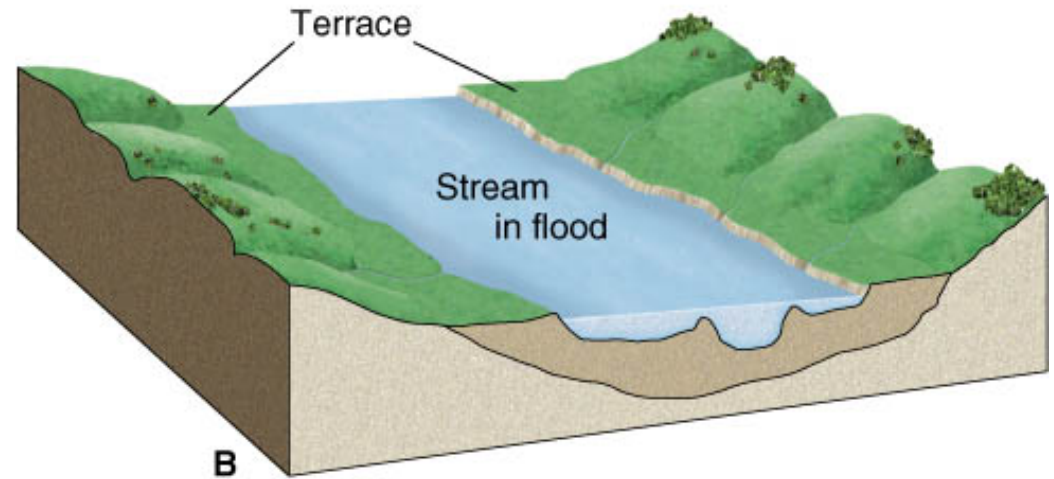
Coalescing Alluvial Fans



Many stream valleys contain one or more relatively flat alluvial terraces that lie above the floodplain.

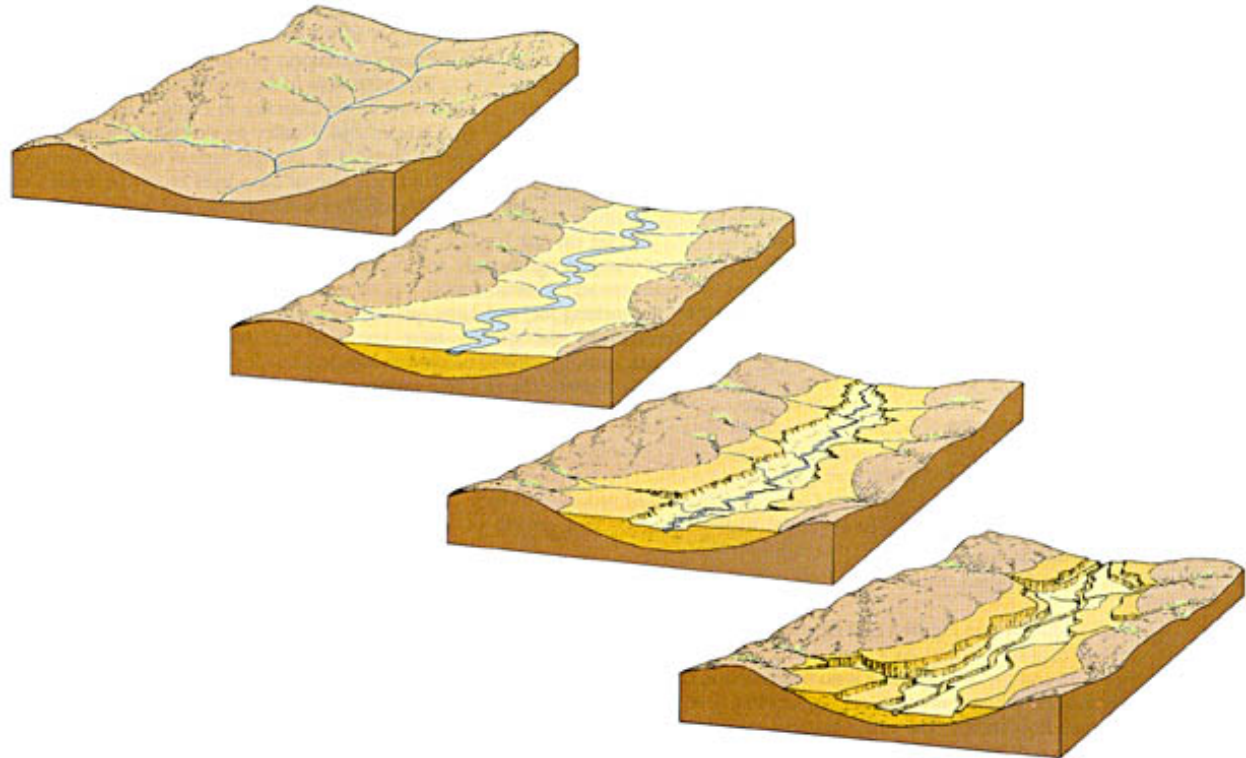


A terrace is a remnant of an abandoned floodplain.

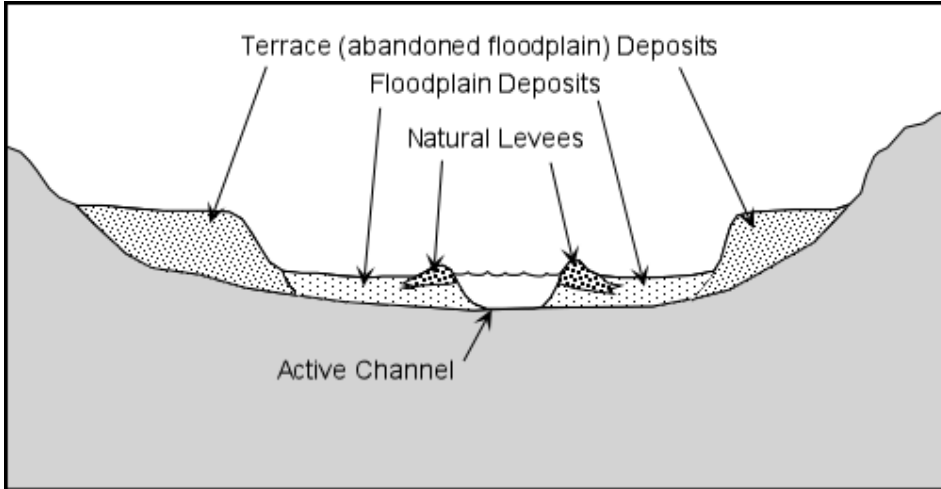


River Terraces

- Streams may create depositional landforms (especially floodplains) and then start to down-cut.
- **Terraces** are abandoned floodplains.



River Terraces



River Terraces

- Changes in whether a stream is eroding or depositing in a given location can be caused by several different phenomena:
 - Tectonic uplift
 - Change in base level downstream
 - Change in climate modifying system's discharge