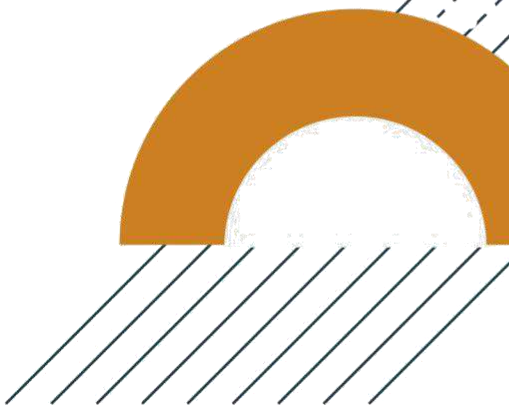




Geography

SELF STUDY GUIDE GEOMORPHOLOGY



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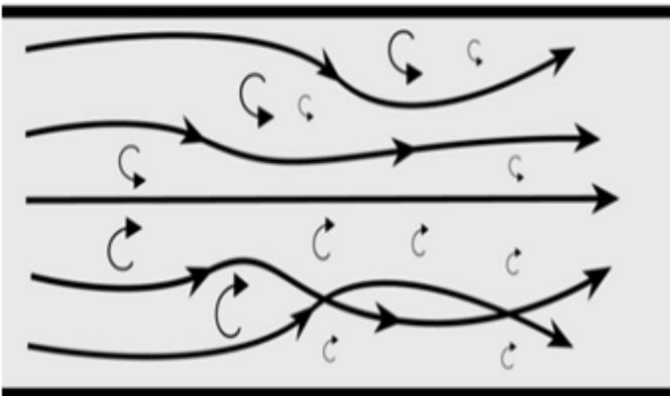
RIVER DISCHARGE

A. KEY CONCEPTS AND NOTES

TURBULENT FLOW

Turbulent flow is water motion characterised by chaotic changes in pressure and velocity

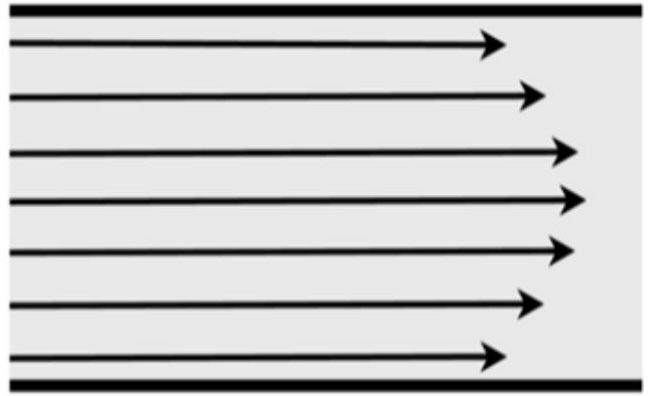
- Water flows bubbly
- Riverbed is uneven
- More erosion



LAMINAR FLOW

Laminar flow is water motion characterised by smooth layers of water

- Water flows in parallel sheets
- Riverbed is even
- Less erosion



B. FLUVIAL PROCESSES

What are Fluvial Processes?

The physical interaction of flowing water and the natural channels of rivers and streams

TYPES OF FLUVIAL PROCESSES

EROSION

It is the processes in which materials are removed by an agent

TRANSPORTATION

It is the process in which eroded materials are carried away

DEPOSITION

It is a process in which material are dumped

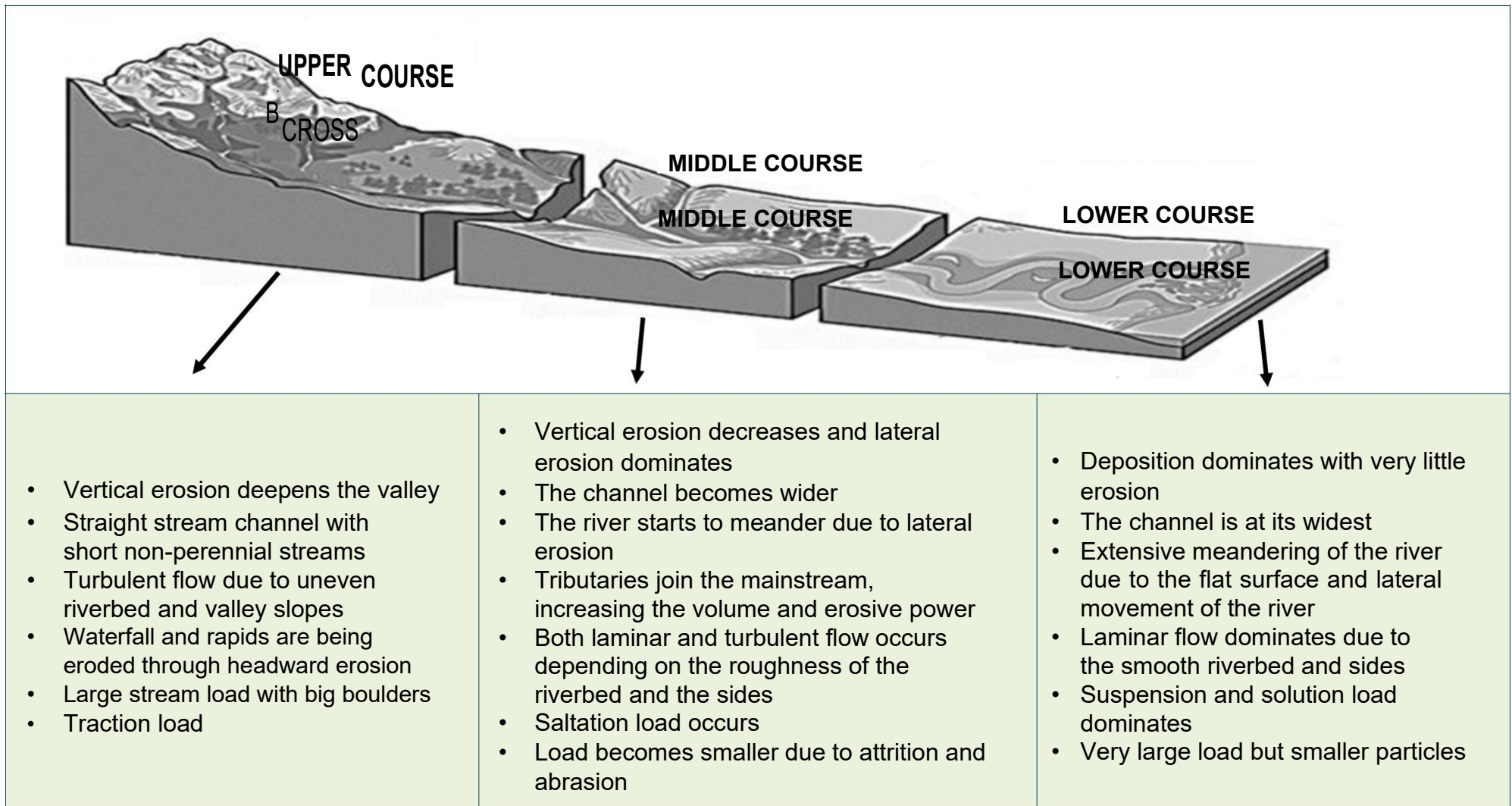
How do the fluvial processes work together?

Primarily vertical erosion. Large boulders deposited and eroded. Continues to cut vertically, but it also begins to cut laterally as it gets closer to the lowest point. Deposition occurs in the slower moving insides of meanders

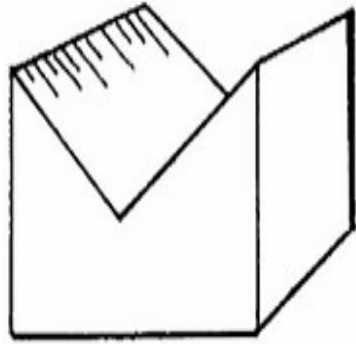
11. RIVER PROFILES AND THE STAGES OF A RIVER

A. LONGITUDINAL PROFILE AND STAGES OF A RIVER

(Longitudinal profile - Side view of a river from source to mouth)

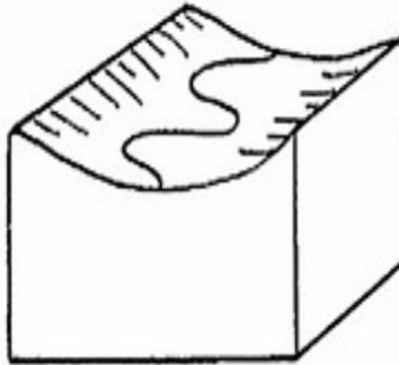


B. CROSS /TRANSVERSE PROFILE: FRONT VIEW OF A RIVER



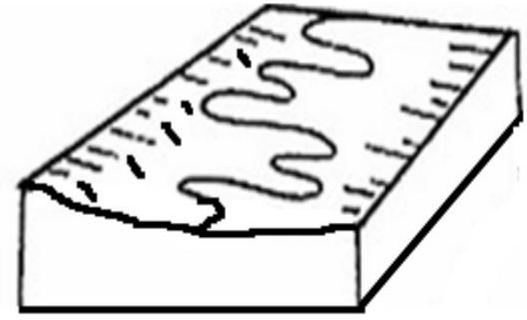
Upper course

V-shaped valleys
Waterfalls
Rapids



Middle course

U-shaped valleys
River starts to meander



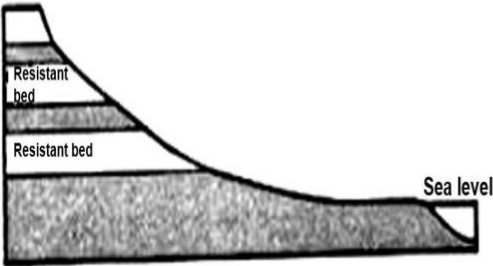
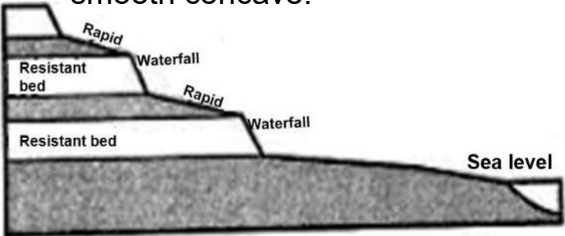
Lower course

Wide open
valley
Floodplain
Deltas

12. RIVER GRADING

A. KEY CONCEPTS AND NOTES

River grading: This is the balance/equilibrium between rate of erosion and rate of deposition.

GRADING	
Graded Rivers When there is a balance between erosion and deposition	Ungraded Rivers When either erosion or deposition dominates
LONGITUDINAL PROFILES OF GRADING	
Graded Profile • The longitudinal profile is SMOOTH CONCAVE • Steep in the upper course and gentle in the lower course 	Ungraded Profile • The longitudinal profile indicates knick points like waterfalls and rapids. • The profile is therefore not smooth concave. 

Permanent / Ultimate base level of erosion

- The lowest level to which a river can erode.
- It is usually sea level

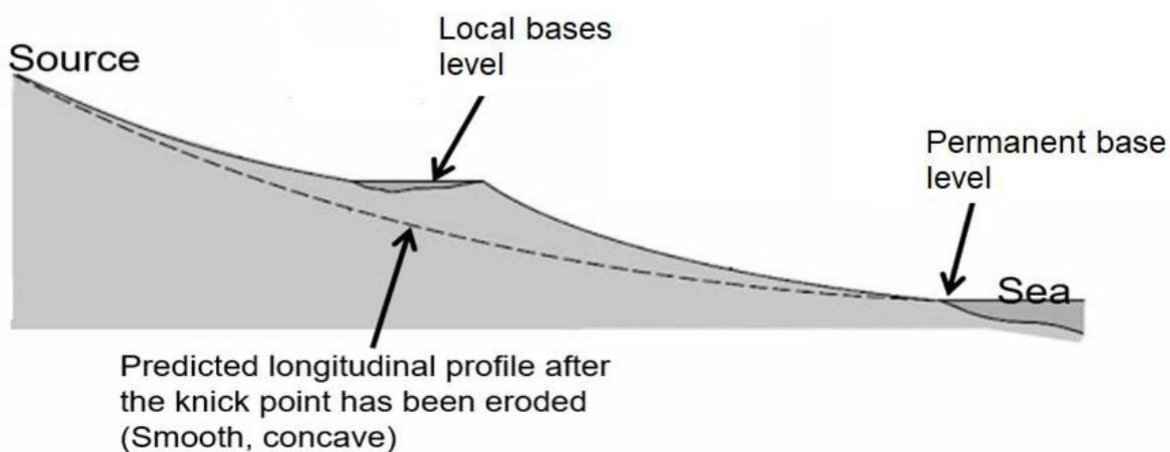
Temporary / Local base level

- When features/ structures delay further erosion
- This local base level causes a knick point in the profile, making it ungraded.

Types of local base levels

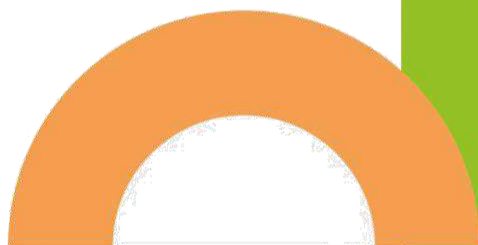
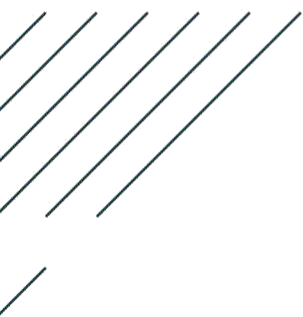
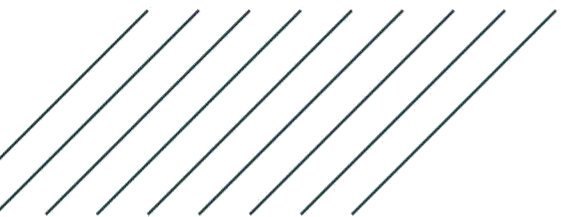
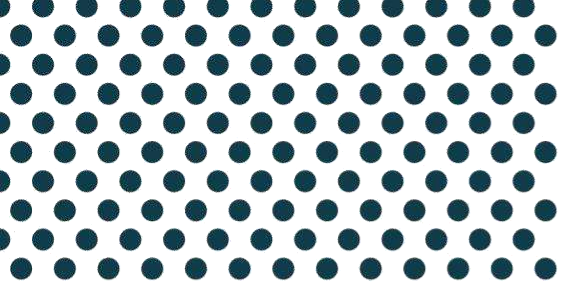
Human-made
e.g., dams

Natural e.g., lakes,
waterfalls, rapids



Processes involved in a river becoming graded from ungraded.

- Downward/Vertical erosion dominates in the upper course causing a steep valley slope.
- Headward erosion removes temporary base levels of erosion in the upper course.
- Downward/Vertical erosion removes temporary base levels (waterfall) in the upper course.
- This material is then transported downstream.
- Discharge of the river increases in middle course causing lateral erosion.
- Gradient in the middle course becomes less steep.
- Deposition dominates in the lower course because the gradient is gentle.
- Deposited materials fill up lakes and dams.
- The river profile will now develop a concave shape from upper to lower course.
- Equilibrium between erosion and deposition will maintain (result in) a graded profile.



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