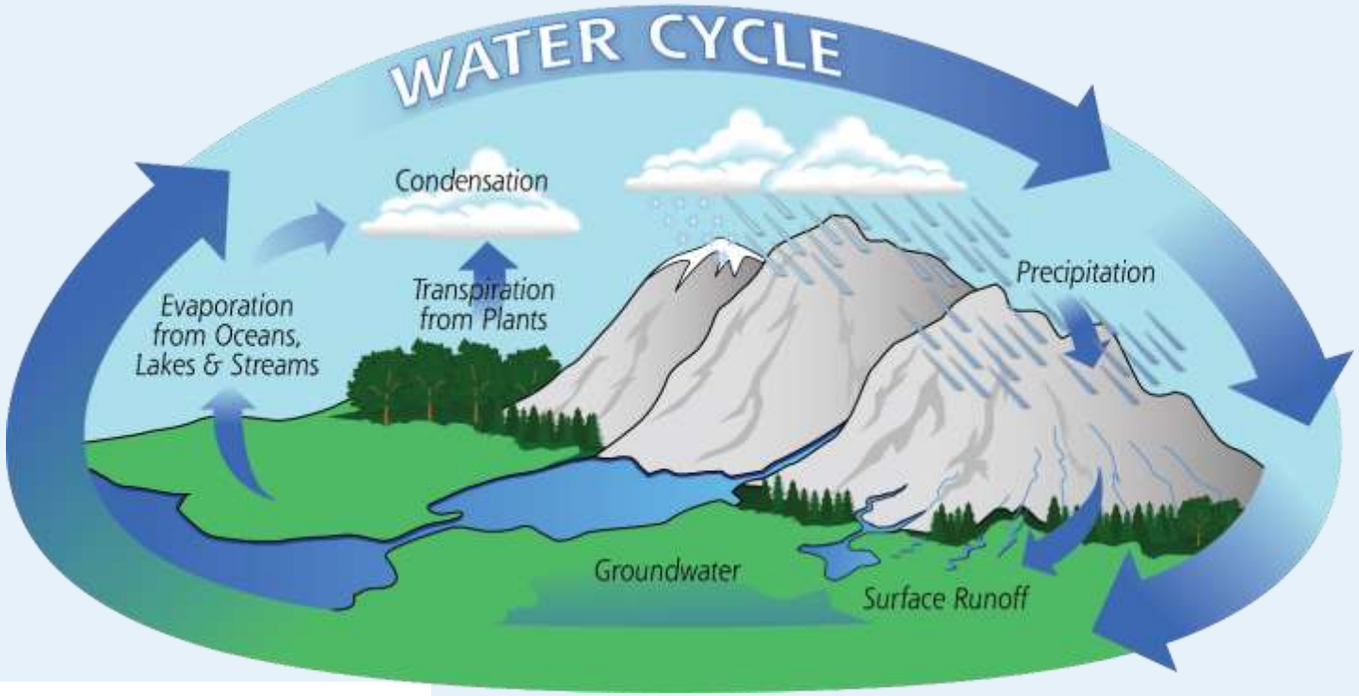
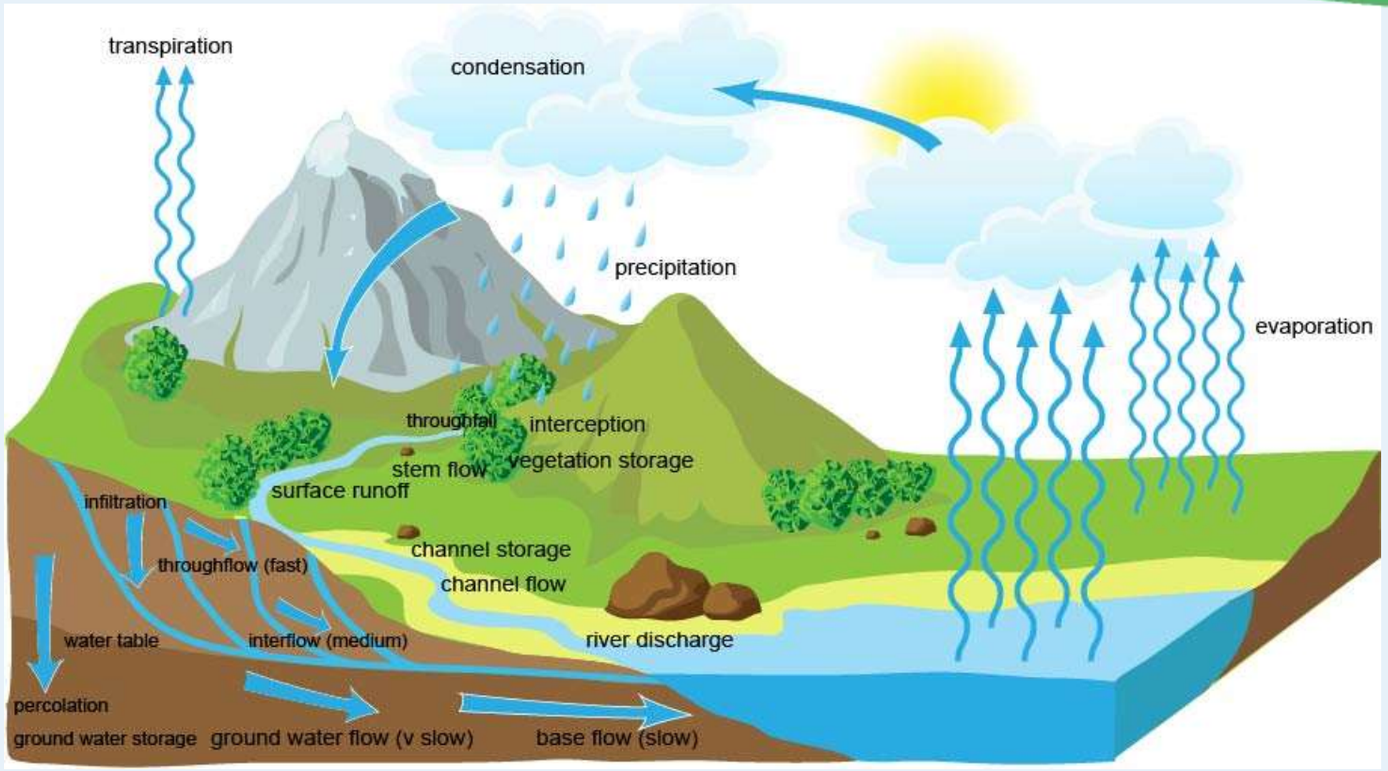
Course Contents

1. Fluvial System
2. **Flow mechanics**
3. Longitudinal Profile
4. Erosion processes
5. Sediment transport
6. Channel morphology
7. Floodplains
8. Terracess

Flow mechanics and regime

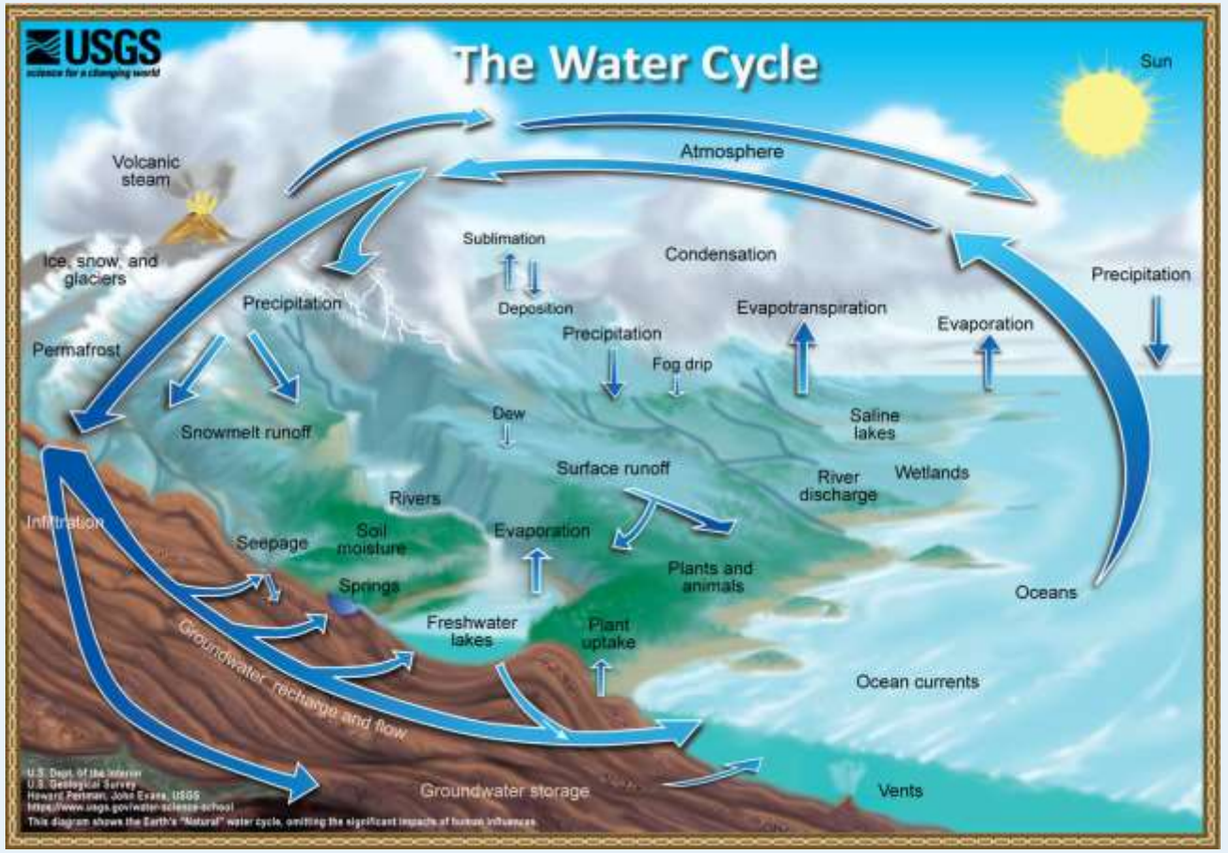


https://gpm.nasa.gov/education/water-cycle



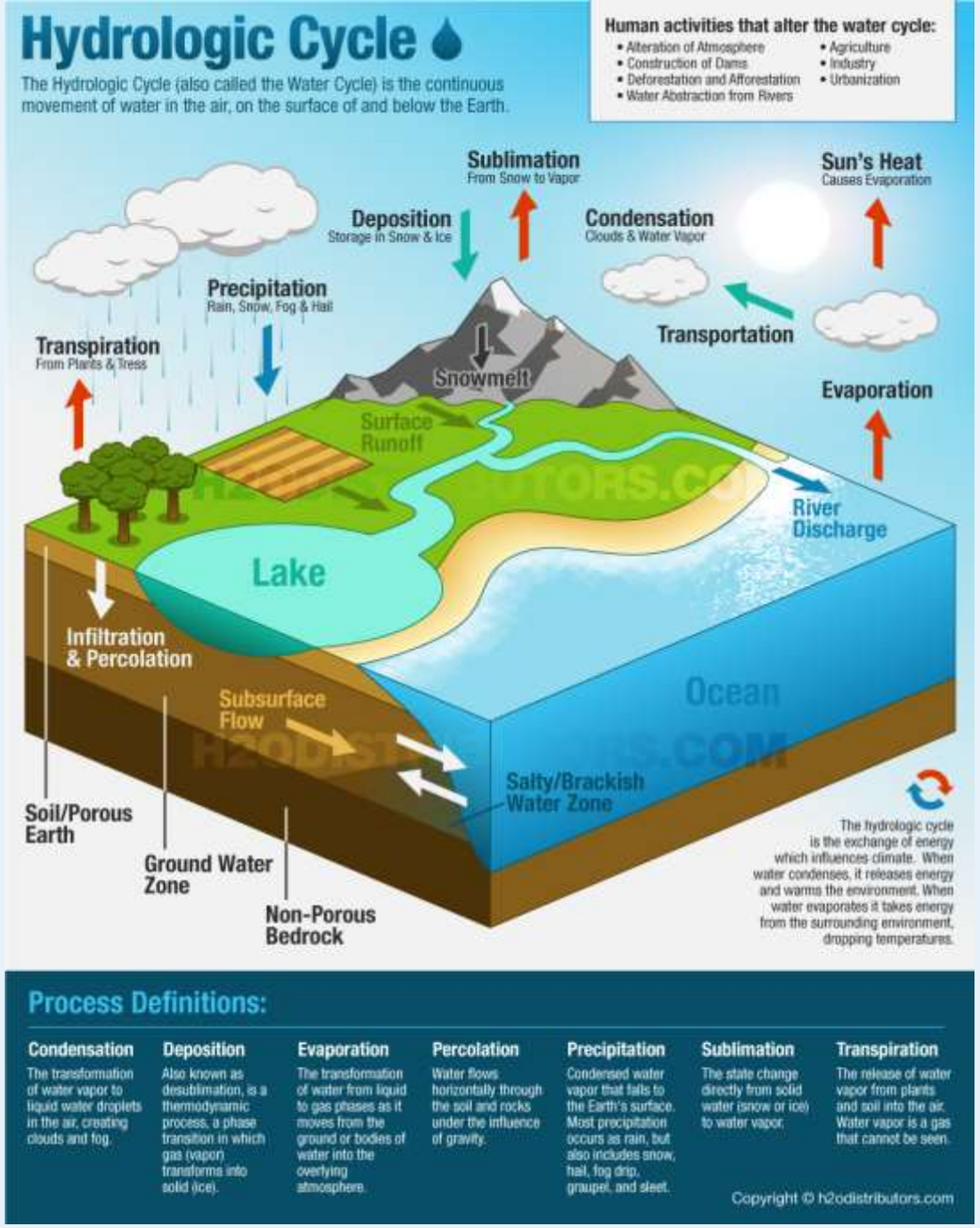
https://www.alevelgeography.com/processes-and-pathways-of-the-water-cycle/

Flow mechanics and regime



https://www.h2odistributors.com/pages/info/info-water-cycle.asp

https://www.youtube.com/watch?v=oaDkph9yQBs&ab_channel=NASAGoddard



https://www.h2odistributors.com/pages/info/info-water-cycle.asp

Flow mechanics and regime

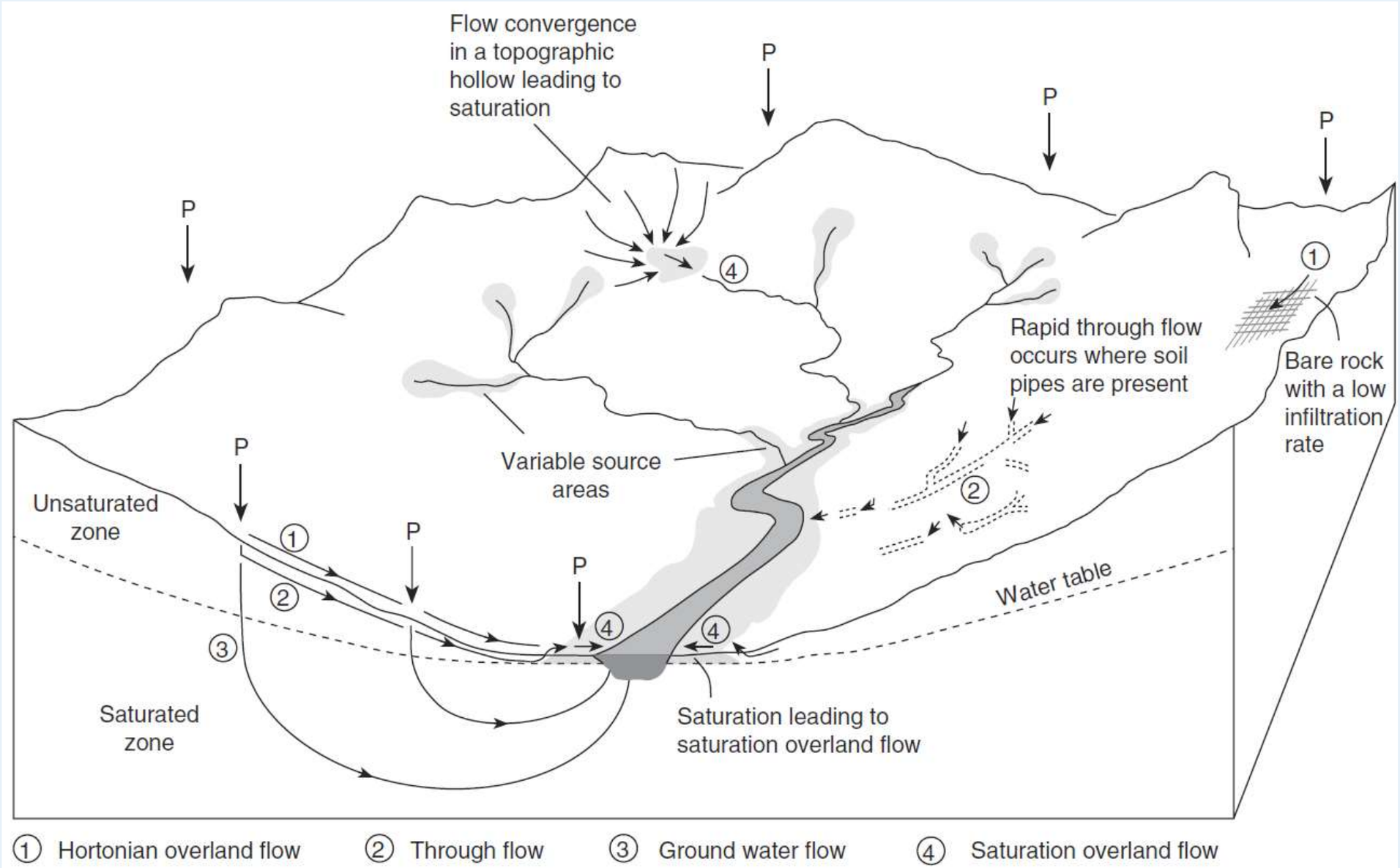
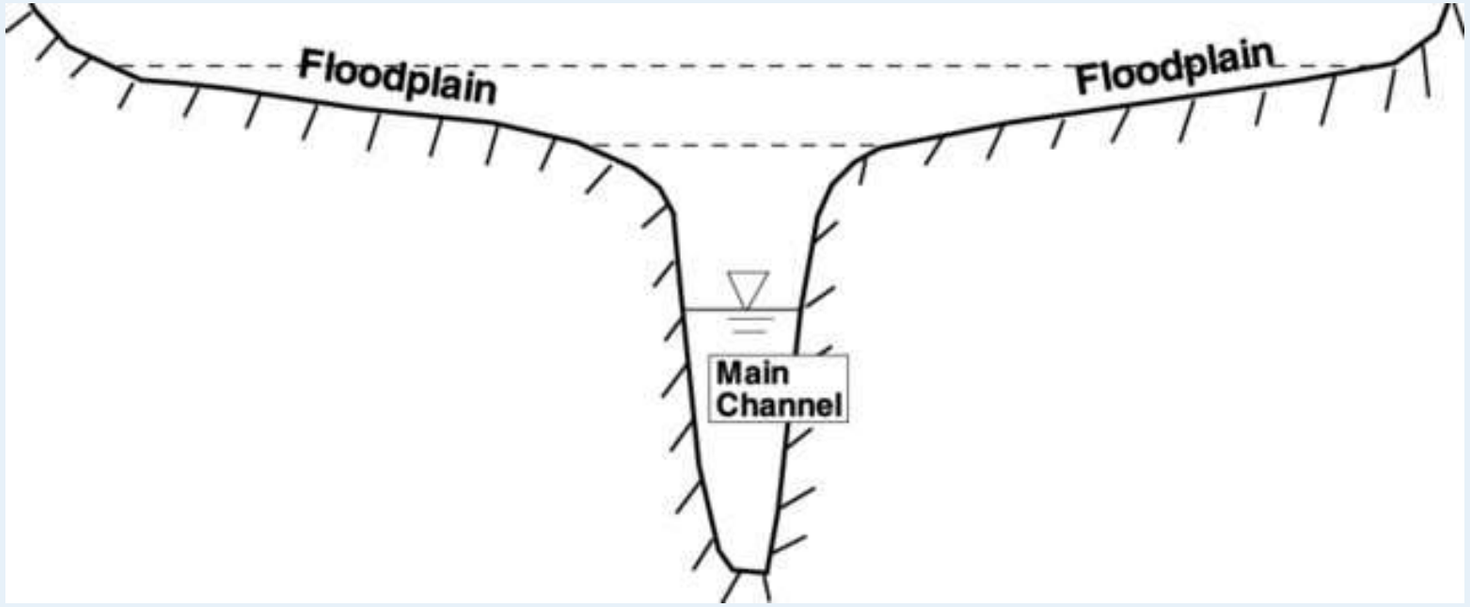


Figure 3.1 Surface and subsurface hydrological pathways.

Flow mechanics and regime

Flow Parameters

- Mass
- Density
- Depth
- Cross-sectional area
- Velocity
- Discharge
- Bed shear stress..

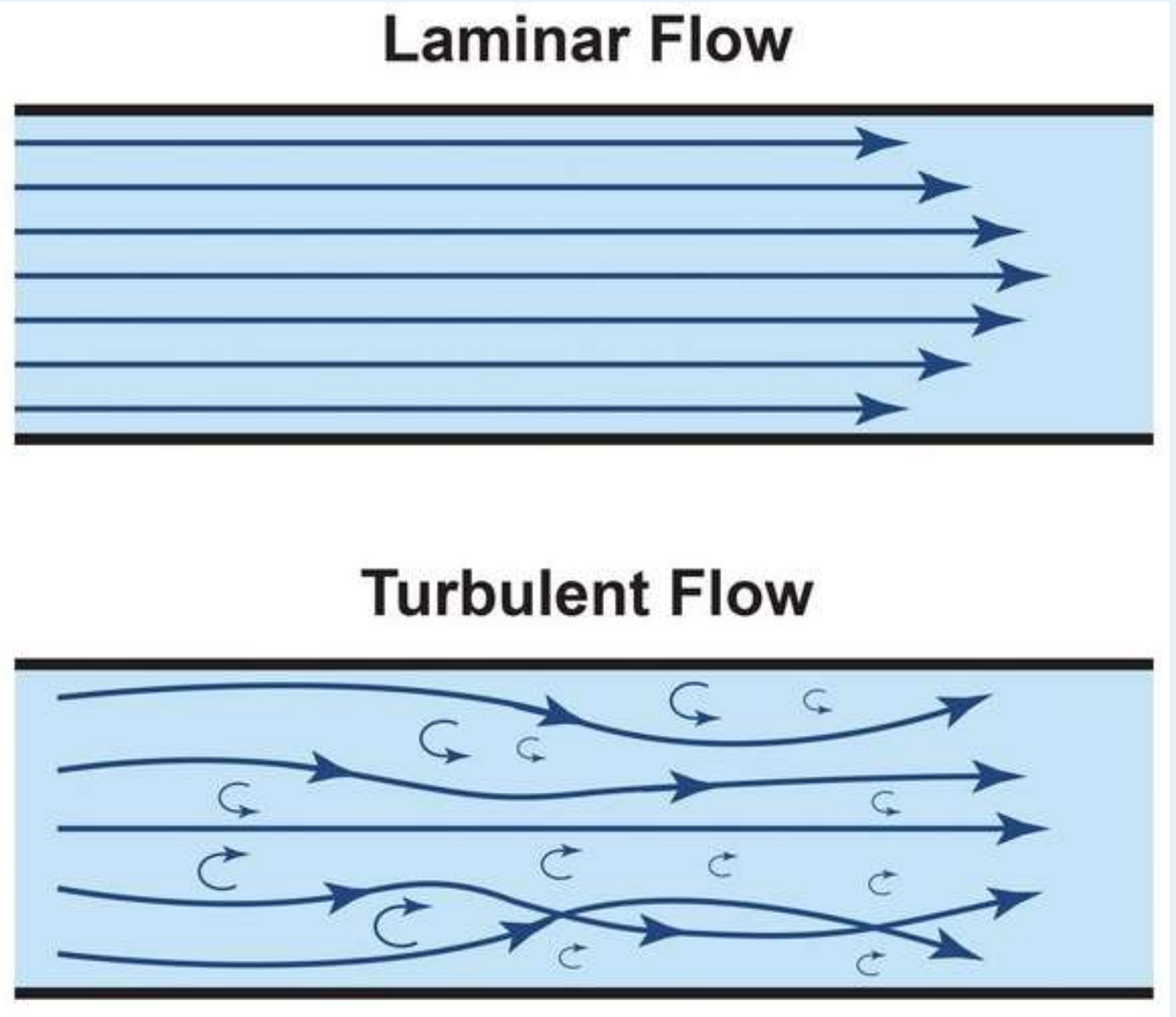


https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2006JC003805

Flow mechanics and regime

Flow Parameters

- Laminar flow
- Turbulent flow

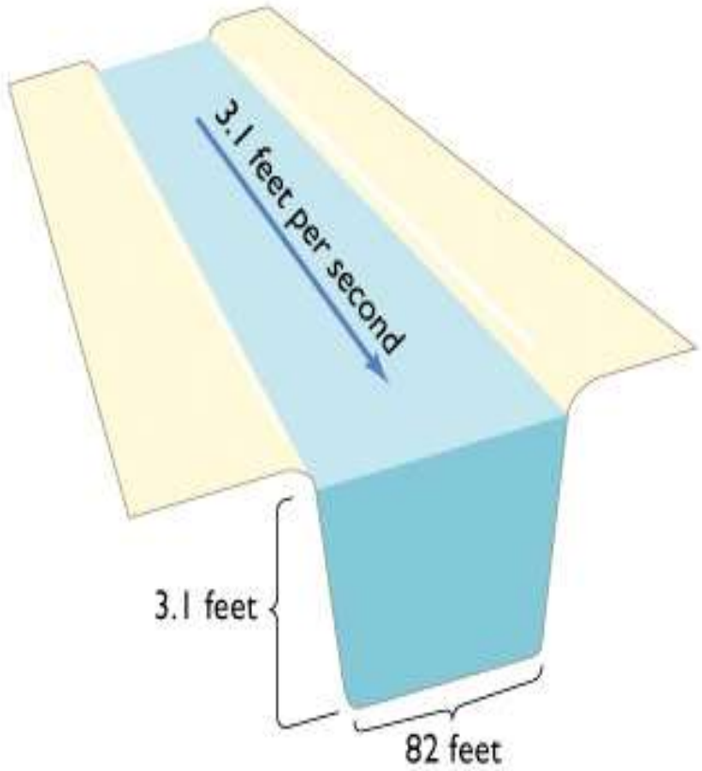


https://www.researchgate.net/publication/337810582_Improving_the_Numerical_Stability_of_Higher_Order_Methods_with_Applications_to_Fluid_Dynamics?channel=doi&linkId=5deb11e792851c8364687dd3&showFulltext=true

Flow mechanics and regime

River discharge

discharge = area x velocity

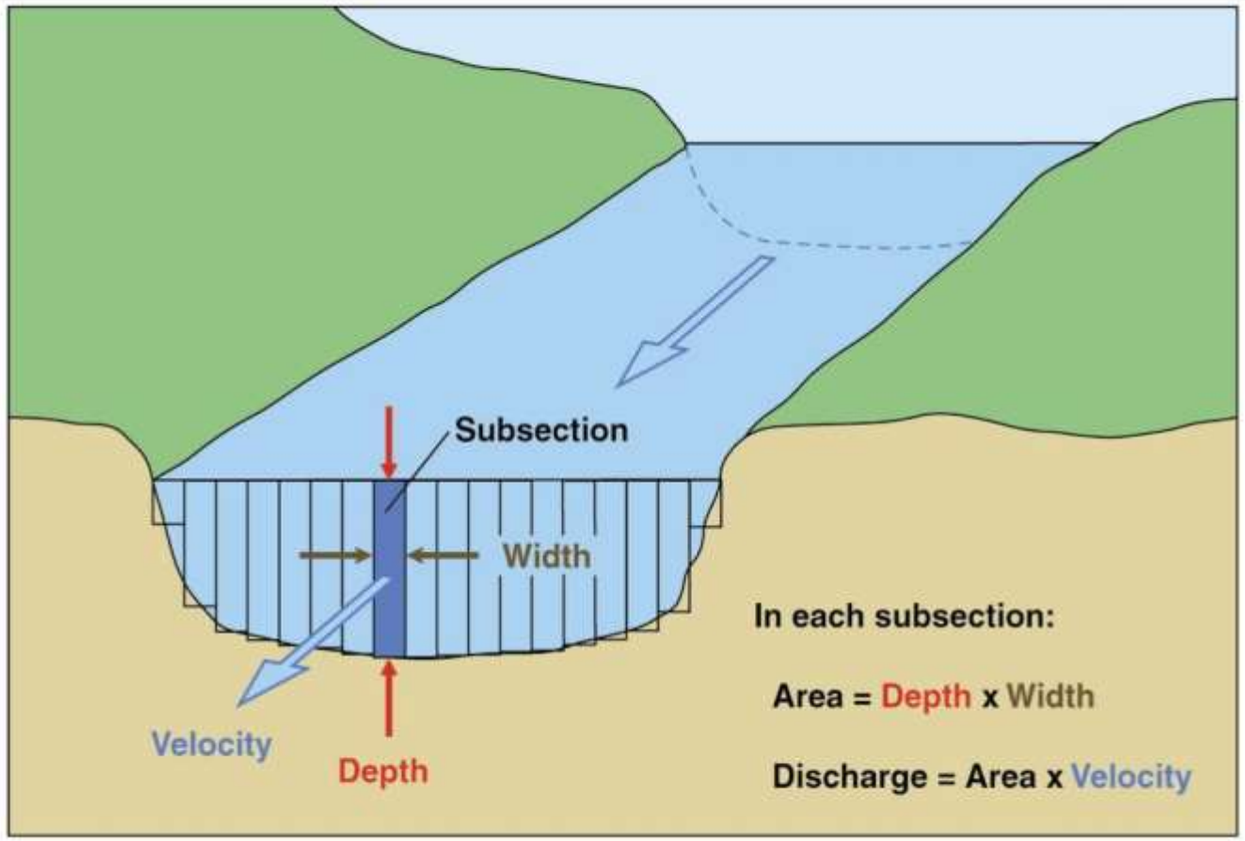


(b) River at high level

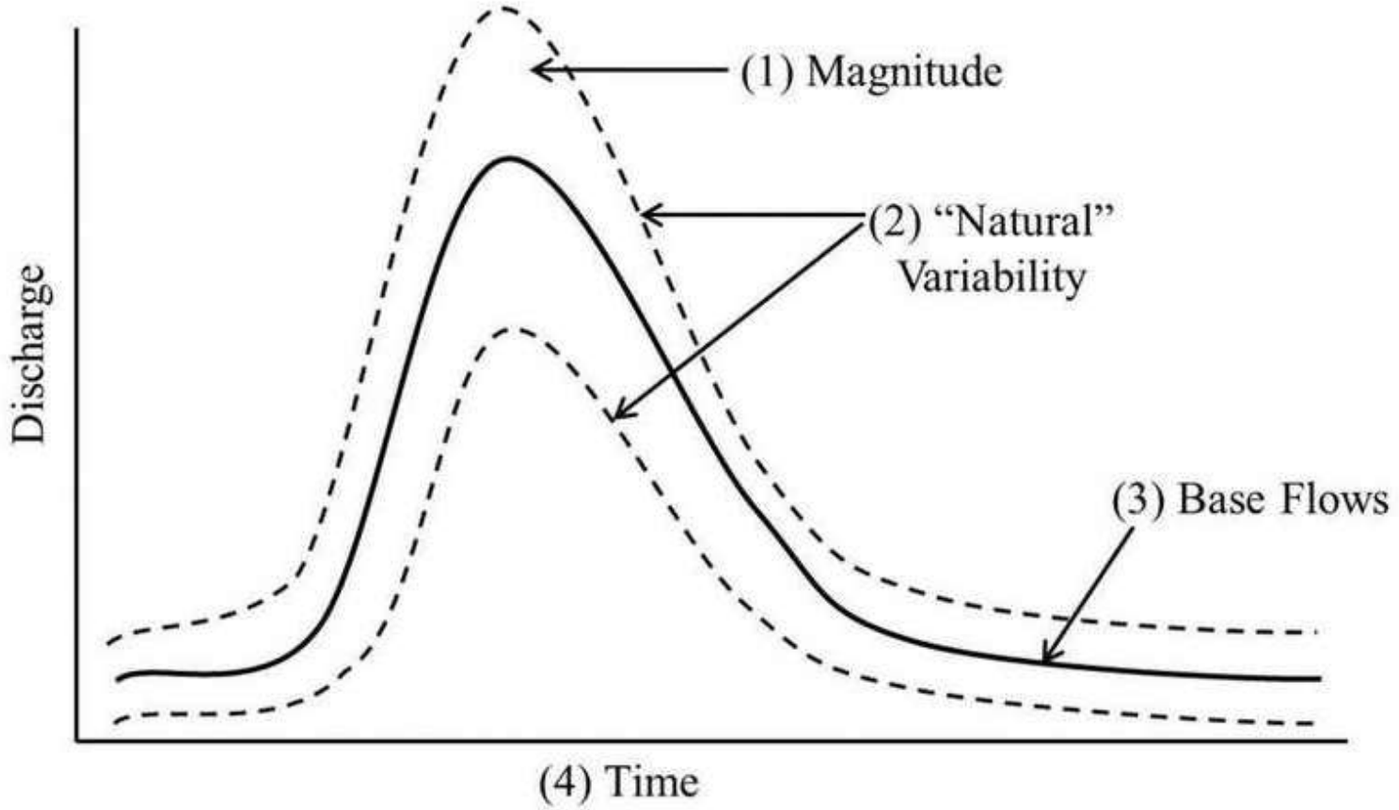
Cross-sectional area high:
3.1 feet × 82 feet = 254.2 feet^2

Velocity high: 3.1 feet/s

Discharge high:
254.2 feet^2 × 3.1 feet/s = 788.02 feet^3/s



Flow mechanics and regime



(1) Large and peak floods allow access to floodplains at the right time for spawning fish, vegetation recruitment, flushing sediment
(2) Overall flow variation maintains habitat (channel and floodplain)
(3) Base flows provide adequate wetted habitat
(4) Timing used as cues for organismal life history characteristics

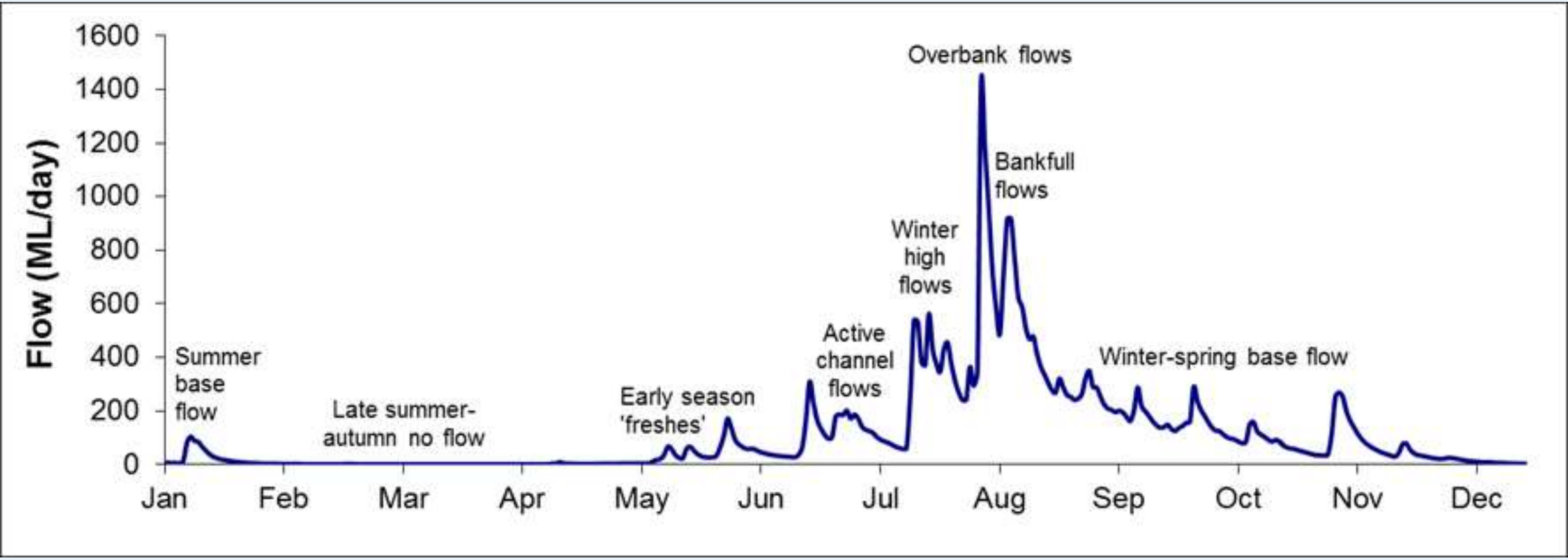
https://www.researchgate.net/publication/317238395_Socio-environmental_tradeoff_analysis_using_decision_science_tools_to_guide_river_management

Flow regime components:

- Magnitude
- Frequency
- Duration
- Predictability
- Rate of change or flashiness

Flow mechanics and regime

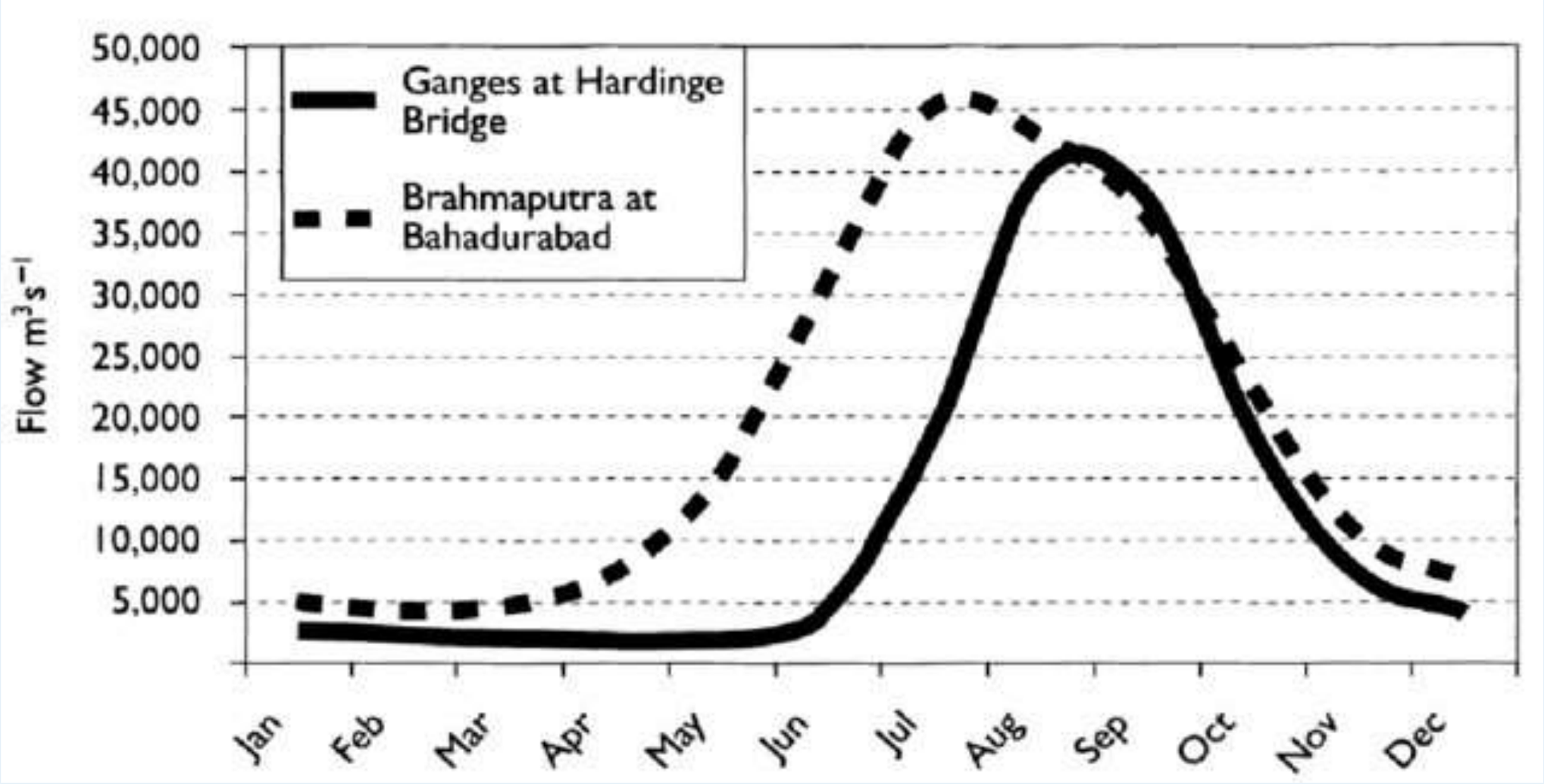
Hydrograph



https://www.water.wa.gov.au/water-topics/waterways/threats-to-our-waterways/altered-flow-regimes

Flow mechanics and regime

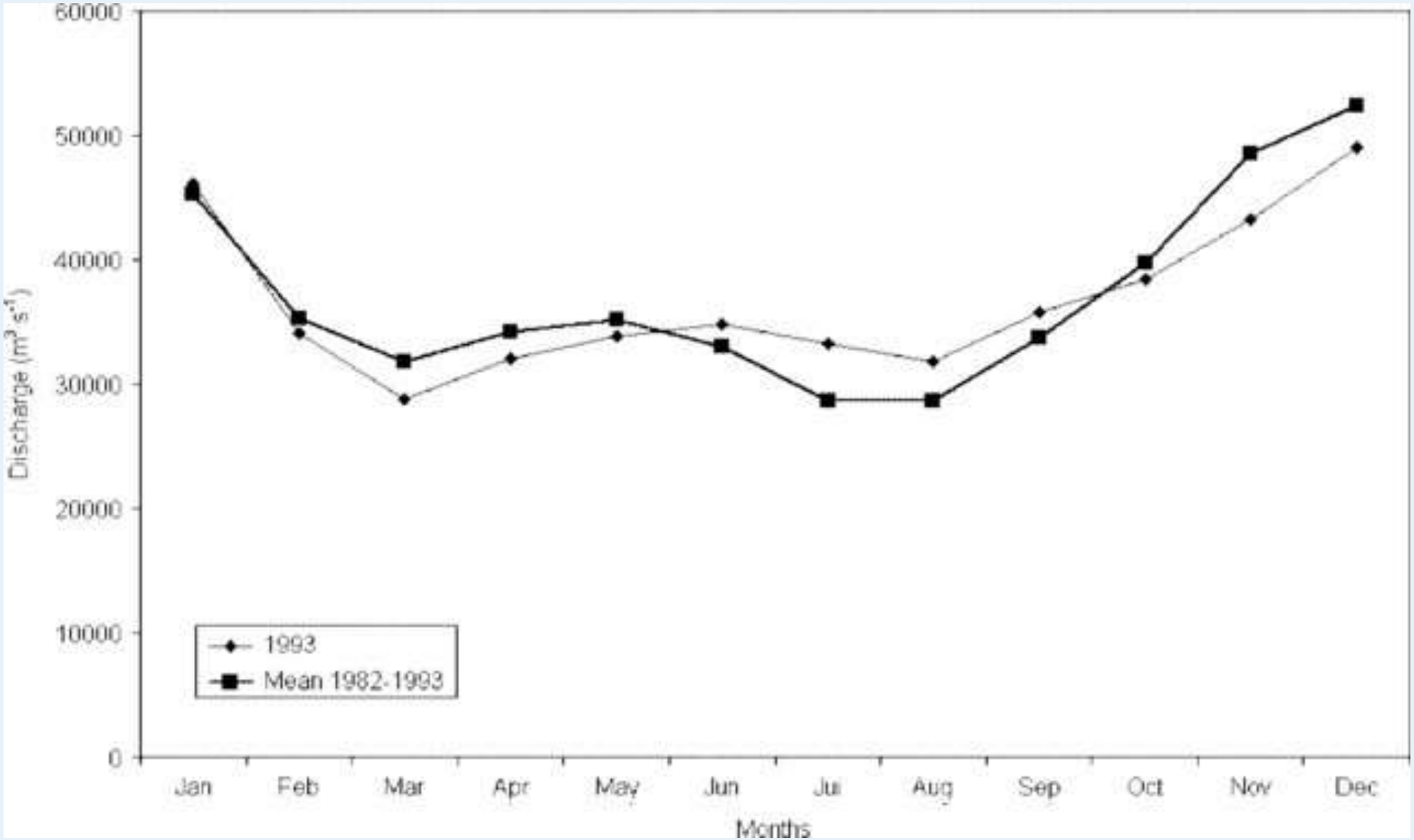
Hydrograph



Ganj

Flow mechanics and regime

Hydrograph



Kongo