

Better physics for coastal dynamics



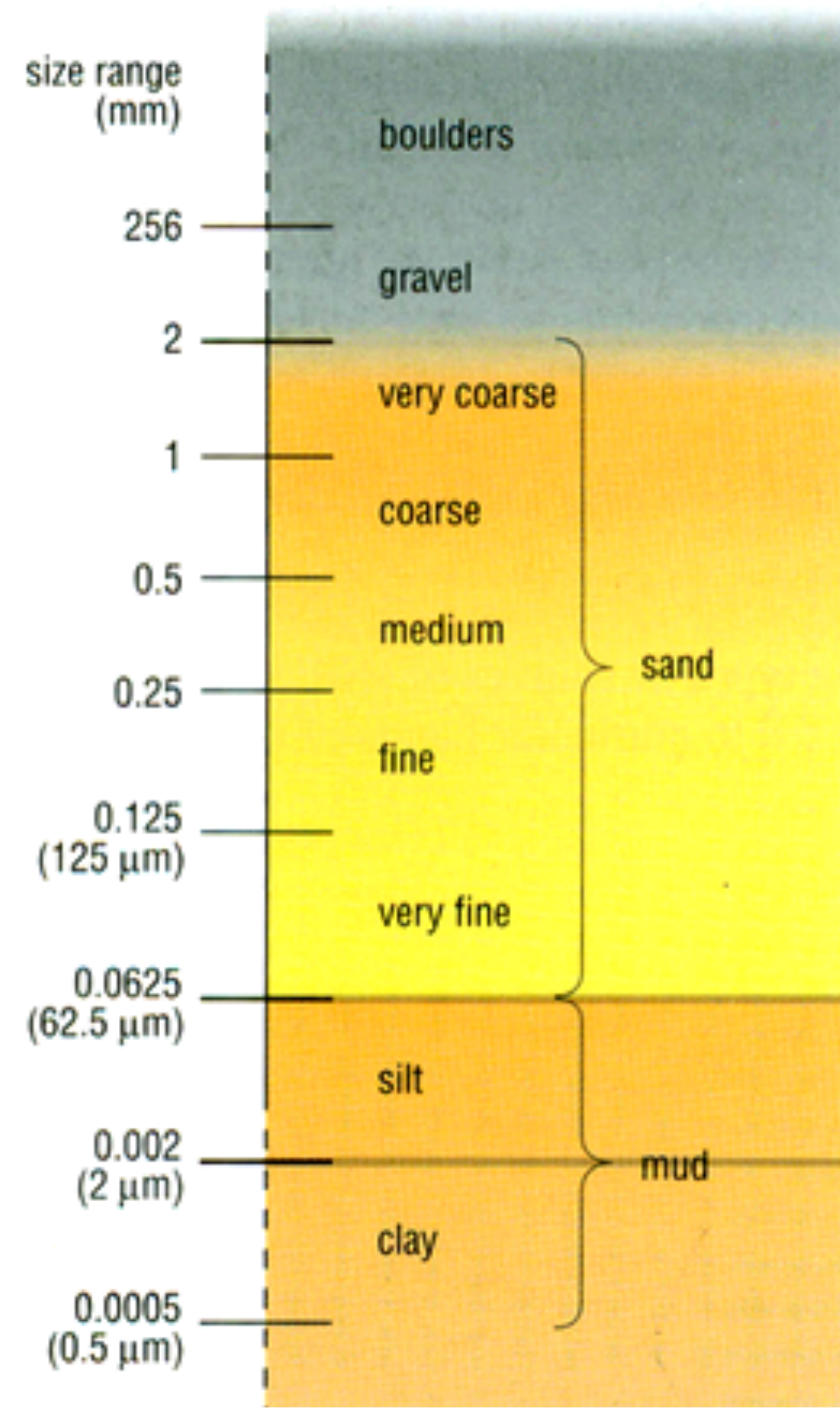
School of Geosciences

- Sediments are moved about more in **shallow water** than in deep water:
 - surface waves can affect the sea-bed
 - tidal currents are stronger in shelf seas than in the open ocean, due to increased tidal ranges
- Sediment transport and deposition are also more easily studied in shallow water **but the principles governing these processes are as valid in the deep ocean as they are in any estuary or beach or anywhere else where there is moving water!**



**one of the most important
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se diment transport

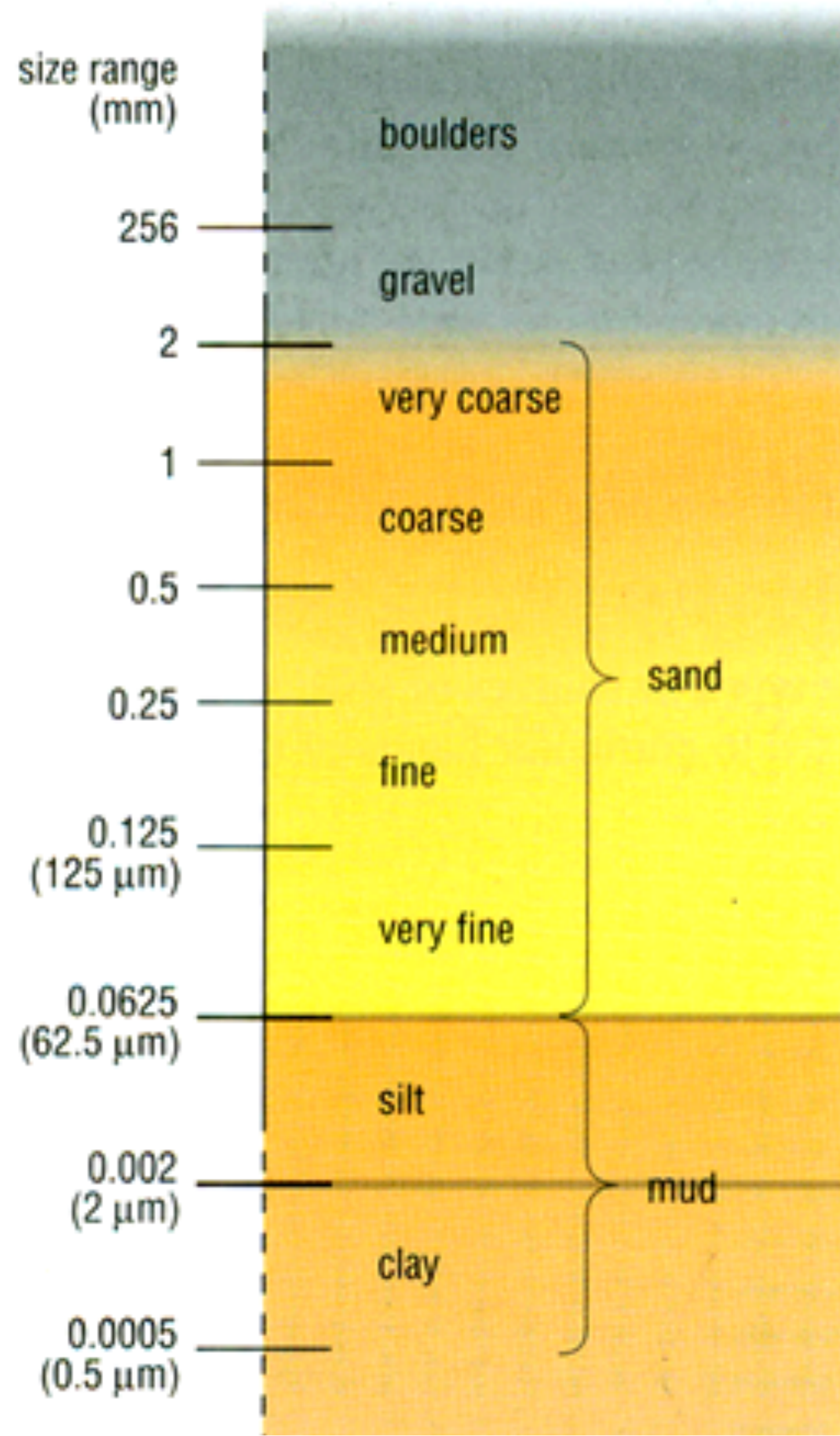


- From your own observations, you know that gentle waves breaking on a sandy beach are capable of washing sand grains up and down the beach but not normally shift pebbles.

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Sediment transport

- Sediments are moved about much **water** than in deep water:
 - surface waves can affect them
 - tidal currents are stronger in the open ocean, due to incursions
- Sediment transport and deposition is easily studied in shallow water but **governing these processes are different in the deep ocean as they are in any beach or anywhere else where there is water!**



- From your own observations, you know that gentle waves breaking on a sandy beach are capable of washing sand grains up and down the beach but not normally shift pebbles.



one of the most important parameter controlling sediment transport and deposition is **grain size**.

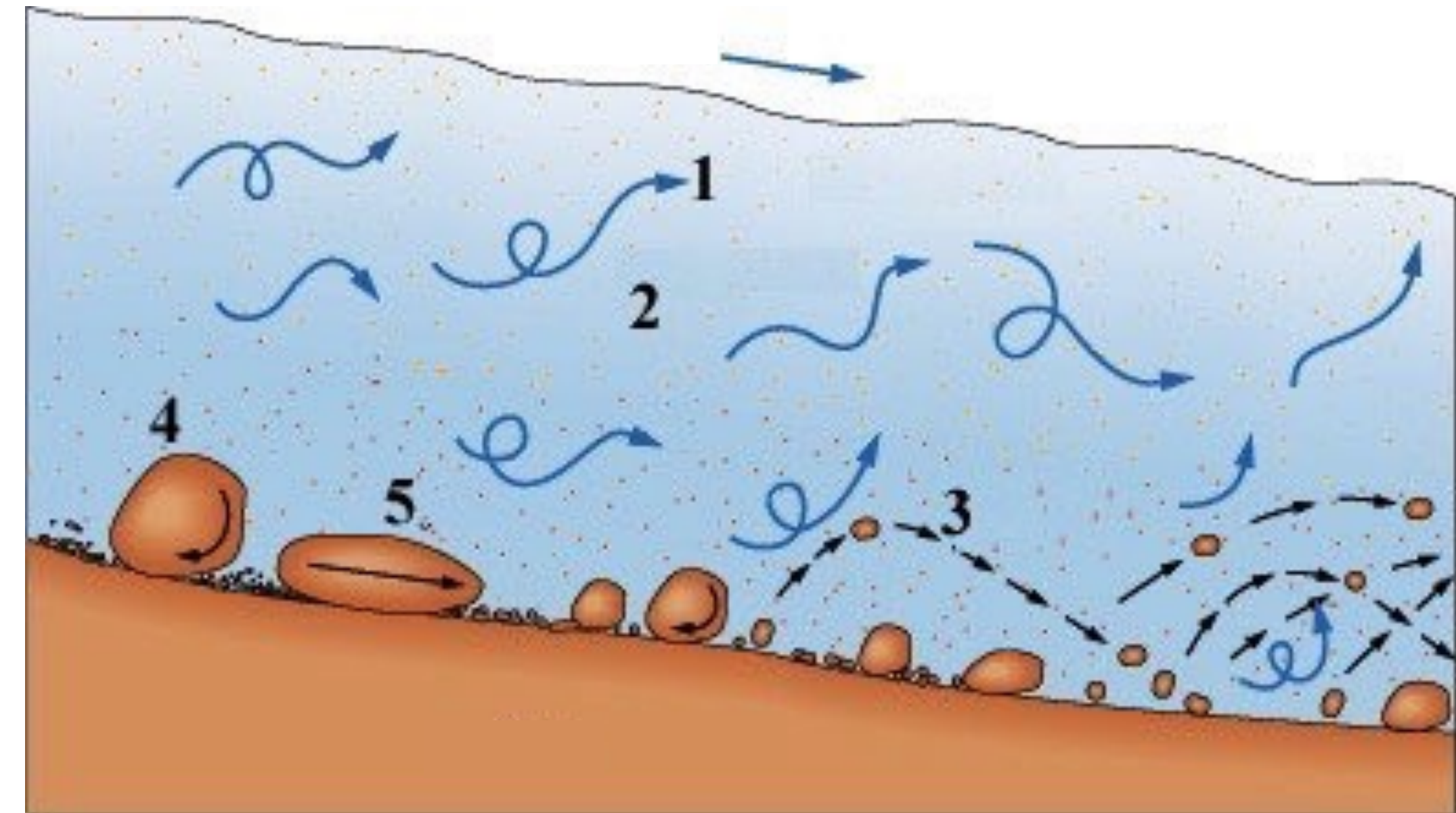
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Sediment transport

Four modes of transport in water:

- **sliding**: particles remain in continuous contact with the bed (merely tilting as they move)
- **rolling**: grains also remain in continuous contact with the bed
- **saltation**: grains 'jump' along the bed in a series of low trajectories

bedload



- **suspension**: particles that follow long and irregular paths within the water

suspended
load