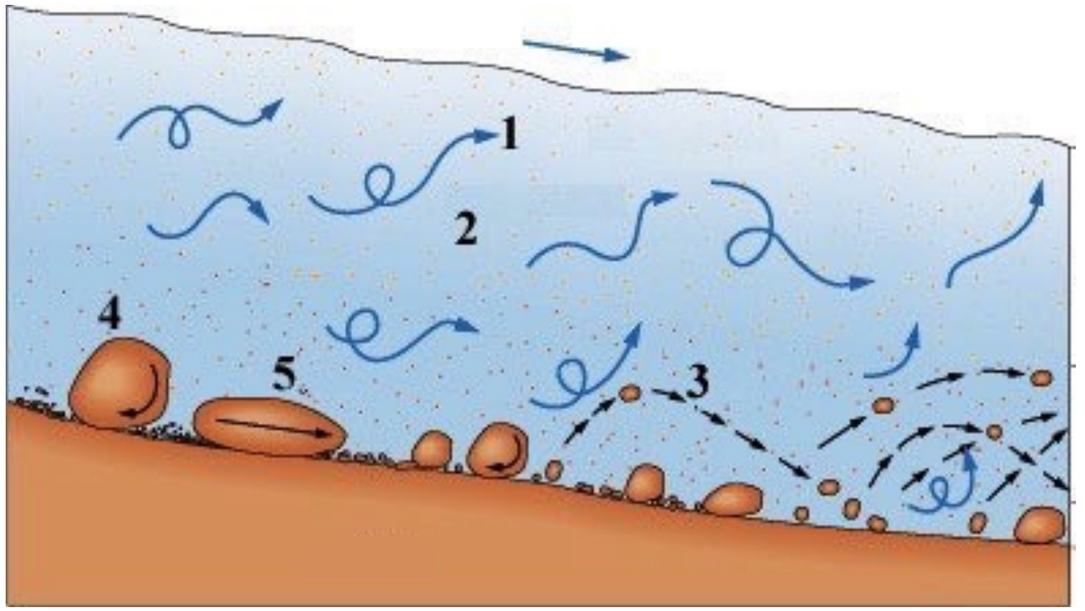
Better physics for coastal dynamics

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

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Sediment transport

- Water flowing near a solid surface is slowed down by a **friction** along the boundary and the region of flow influenced by proximity to the surface is called the **boundary layer**.

- In theory, provided that no sediment on the bed is moving, the thin layer of water in direct contact with the bed is also stationary: its speed should be zero.

- With increasing distance from the bed the successive layers of water move a little faster as the effects of friction with the bed decrease

- There is thus a velocity gradient — a change of velocity with depth or **velocity shear**