Deposition (geology)

Deposition is the geological process in which sediments, soil and rocks are added to a landform or landmass. Wind, ice, water, and gravity transport previously weathered surface material, which, at the loss of enough kinetic energy in the fluid, is deposited, building up layers of sediment.

where:

- π is the ratio of a circle's circumference to its diameter.
- R is the radius of the spherical object (in m),
- ρ is the mass density of the fluid (kg/m^3),
- g is the gravitational acceleration (m/s^2),
- C_d is the drag coefficient, and
- w_s is the particle's settling velocity (in m/s).

the sediment moving;[4] with the suspended load this can be some distance as the particles need to fall through the water column. This is determined by the grain's downward acting weight force being matched by a combined buoyancy and fluid drag force [4] and can be expressed by:

$$\frac{4}{3}\pi R^3 \rho_s g = \frac{4}{3}\pi R^3 \rho g + \frac{1}{2}\mathbb{C}_d \rho \pi R^2 w_s^2$$

Downward acting weight force = Upward-acting buoyancy force + Upward-acting fluid drag force [4]

profile and forces due to flow asymmetry; the position where there is zero net transport is known as the null point and was first proposed by Cornaglia in 1889.[3] Figure 1 illustrates this relationship between sediment grain size and the depth of the marine environment.

Figure 1. Illustrating the sediment size distribution over a shoreline profile, where finer sediments are transported away from high energy environments and settle out of suspension, or deposit in calmer environments. Coarse sediments are maintained in

The null-point hypothesis explains how sediment is deposited throughout a shore profile according to its grain size. This is due to the influence of hydraulic energy, resulting in a seaward-fining of sediment particle size, or where fluid forcing equals gravity for each grain size.[2] The concept can also be explained as "sediment of a particular size may move across the profile to a position where it is in equilibrium with the wave and flows acting on that sediment grain".[3] This sorting mechanism combines the influence of the down-slope gravitational force of the

refer to the buildup of sediment from organically derived matter or chemical processes. For example, chalk is made up partly of the microscopic calcium carbonate skeletons of marine plankton, the deposition of which has induced chemical processes (diagenesis) to deposit further calcium carbonate. Similarly, the formation of coal begins with the deposition of organic material, mainly from plants, in anaerobic conditions.

Null-point hypothesis

Map of Cape Cod showing shores undergoing erosion (cliffed sections) in yellow, and shores characterized by marine deposition (barriers) in blue.[1]

Deposition occurs when the forces responsible for sediment transportation are no longer sufficient to overcome the forces of gravity and friction, creating a resistance to motion; this is known as the null-point hypothesis. Deposition can also