Oceanography
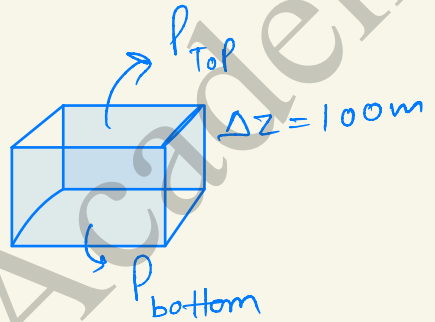
Que: Near Sea level, a height increases of 100m corresponds to what pressure decrease

Answer

Given

$$\rho = 1.225 \ kg \cdot m^{-3}$$

at sea level

$$\Delta z = 100 \ m$$

$$\Delta P = 8 \ kPa$$

$$\boxed{\Delta P = \rho \cdot g \cdot \Delta z} \rightarrow \Delta P = \rho \cdot g \cdot \Delta z$$

$$= (1.225 \ kg \cdot m^{-3}) \cdot (-9.8 \ m \cdot s^{-2}) (100 \ m)$$

$$= -1200.5 \ kg \cdot m^{-1} \cdot s^{-2}$$

$$= -1.20 \ kPa$$

Que- for an intertial ocean current of 5m/s, find the radius of curvature & time period to complete one circuit. Assume a latitude where $f_c = 10^{-4}\,s^{-1}$

Given $M_i = 5\,m/s$

$$f_c = 10^{-4}\,s^{-1}$$

find $R = ?\,km$ $P = ?\,h$

$$R = -\frac{M_i}{f_c}$$ $\Big\{$ Intertial wind coasts around a circular path of radius R'

where M_i — intertial wind speed
f_c — Coriolis parameter

$$R = \frac{-(5\,m/s)}{(10^{-4}\,s^{-1})} = -50\,km$$

$$P = \frac{2\pi}{f_c} = 62832\,s = 17.45\,h$$

MG

Q — If the elevation of wave cut platform is 55 m above the sea level & age of the Erosional surface is 120 kilo years, the rate of rock uplift at this coastal location is _____ m/kilo years.

Solution

Rate of Rock uplift

$$= \frac{\text{Elevation of wave cut platform}}{\text{age of Erosional surface}}$$

$$= \frac{55\ m}{120\ k.y}$$

$$= 0.46\ m/k.y$$