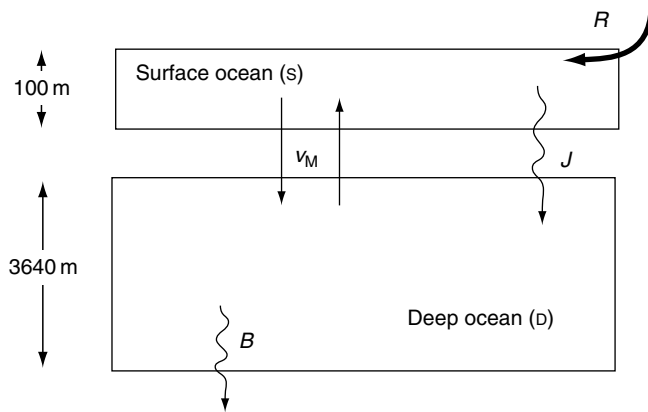


**Figure 6.1.** A schematic representation of the two-layer ocean model including the equations for the surface and deep-ocean mass balance of dissolved constituent  $C$  ( $\text{mol m}^{-3}$ ).  $J$ , particle flux ( $\text{mol yr}^{-1}$ );  $V_D$ , ocean volume ( $1.35 \times 10^{18} \text{ m}^3$ );  $V_S$ , surface ocean volume ( $3.62 \times 10^{10} \text{ m}^3$ );  $R$ , river water flow ( $3.5 \times 10^{13} \text{ m}^3 \text{ yr}^{-1}$ );  $v_M$ , water exchange rate ( $\text{m}^3 \text{ yr}^{-1}$ ),  $B$ , burial flux ( $\text{mol yr}^{-1}$ ).



Surface layer

$$V_S \frac{d[C_S]}{dt} = R[C_R] - v_M([C_S] - [C_D]) - J$$

Deep ocean

$$V_D \frac{d[C_D]}{dt} = v_M([C_S] - [C_D]) + J - B$$