



**Figure 10.1.** A schematic representation of the boundary layers for momentum, heat and mass near the air–water interface. The velocity of the water and the size of eddies in the water decrease as the air–water interface is approached. The larger eddies have greater velocity, which is indicated here by the length of the arrow in the eddy. Because random molecular motions of momentum, heat and mass are characterized by molecular diffusion coefficients of different magnitude ( $0.01 \text{ cm}^2 \text{ s}^{-1}$  for momentum,  $0.001 \text{ cm}^2 \text{ s}^{-1}$  for heat and  $10^{-5} \text{ cm}^2 \text{ s}^{-1}$  for mass), there are three different distances from the wall where molecular motions become as important as eddy motions for transport. The scales are called the viscous (momentum), thermal (heat) and diffusive (molecular) boundary layers near the interface.