

**Table 4.9.** Terms relating waves to water depth

**Symbols**

- **D** = Depth of water
- **L** = Length of wave
- **H** = Height of wave

**Deep-water waves**

Deep-water waves are waves traveling across a body of water where depth is greater than half the wavelength ( $D > 1/2 L$ ). Deep-water waves include all wind-generated waves moving across the open ocean.

**Transitional waves**

Transitional waves are waves traveling in water where depth is less than half the wavelength but greater than one-twentieth the wavelength ( $1/20 L < D < 1/2 L$ ). Transitional waves are often wind-generated waves that have moved into shallower water.

**Shallow-water waves**

Shallow-water waves are waves traveling in water where depth is less than one-twentieth the wavelength ( $D < 1/20 L$ ). Shallow-water waves include wind-generated waves that have moved into shallow, nearshore areas, tsunamis (seismic waves) generated by disturbances in the ocean floor, and tide waves generated by the gravitational attraction of the sun and moon.

**Breaking shallow-water waves**

Breaking shallow-water waves are unstable shallow-water waves. Usually shallow-water waves begin to break when the ratio of wave height to wavelength is 1 to 7 ( $H/L = 1/7$ ), when the wave's crest peak is steep (less than  $120^\circ$ ), or when the wave height is three-fourths of the water depth ( $H = > 3/4 D$ ).

**Breaking deep-water waves**

Breaking unstable deep-water waves are waves that begin to break when the seas are confused (waves from mixed directions) or when the wind blows the crests off waves, forming whitecaps.