

# Ch 19.3 Regional Wind Systems

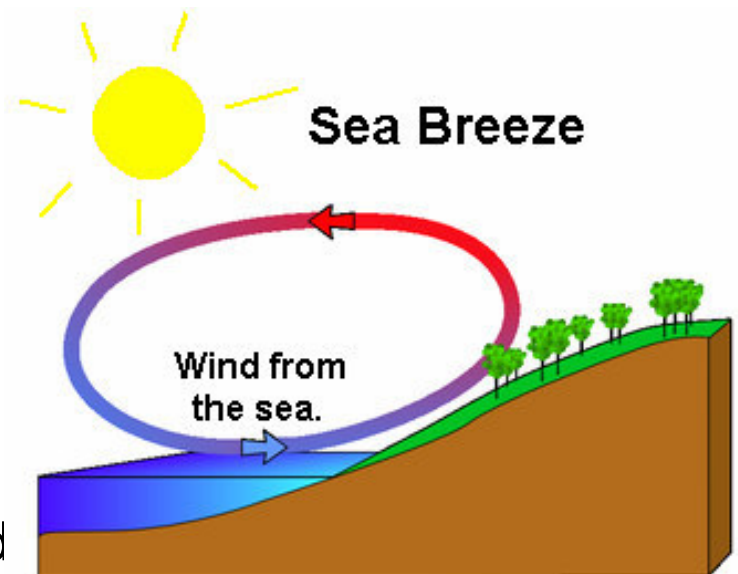
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## Local Winds

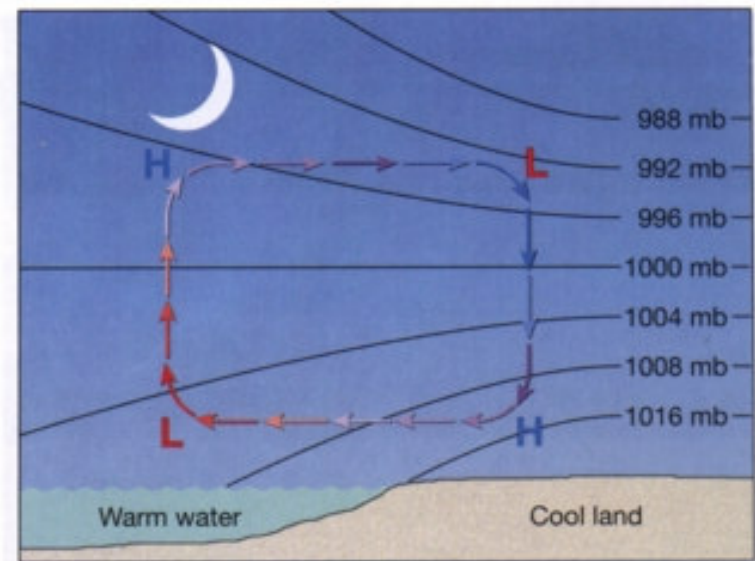
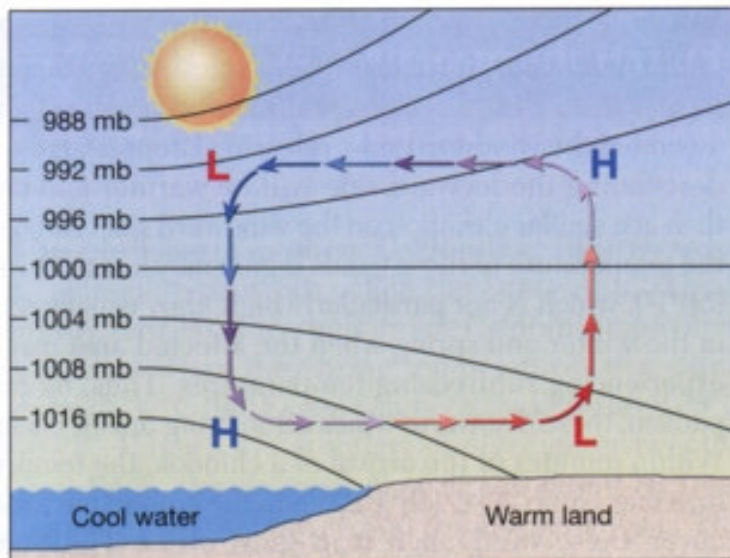
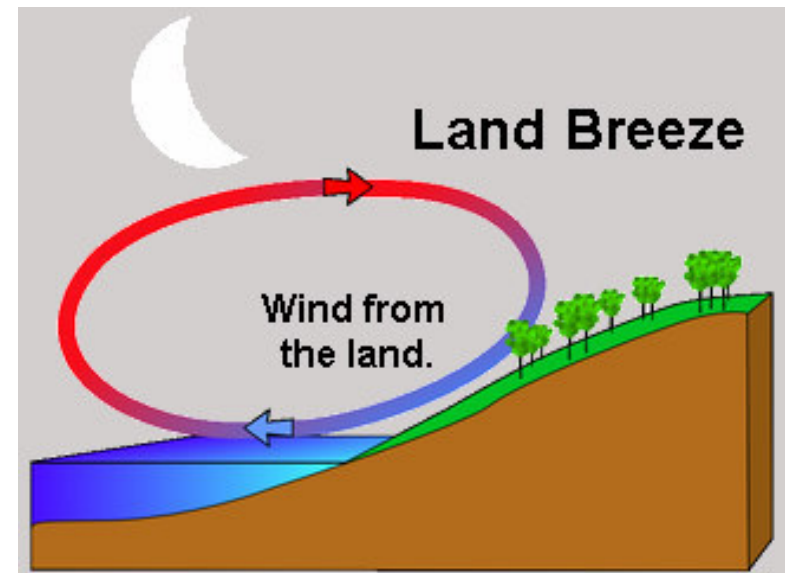
- Small-scale or local winds are produced by locally generated pressure gradient. Local winds are caused either by topographic effects or by variations in surface composition – land and water.

## Land and Sea Breezes

- In coastal areas, the land surface is heated more intensely during the daylight hours than adjacent body of water.
- As a result, the air above the land heats up, expands, and rises, creating an area of low pressure.
- A **sea breeze** then develops because of the colder air over the water moves toward the land creating a cool wind blowing in from the sea.



- At night, the reverse may take place. The land cools more rapidly than the sea, and a **land breeze** develops.
- The cooler air at higher pressure over land moves to the sea, where the air is warmer and at lower pressure.
- Small-scale sea breezes can also develop along the shores of the Great Lakes.
- This lake-effect, cool sea breeze cools summer temperatures near the lake as compared to warmer outlying areas.



## Valley and Mountain Breezes

- During the daylight hours, the air along slopes of the mountains is heated and becomes less dense. This causes the warm air to generate a **valley breeze** and flow up the valleys.
- After sunset, the process can reverse. The rapid cooling air becomes denser and start to flow downslope into the valleys and cause a **mountain breeze**. This happens in the Grand Canyon. The sound of the rushing wind can be louder than the Colorado River below.

