# Local Winds

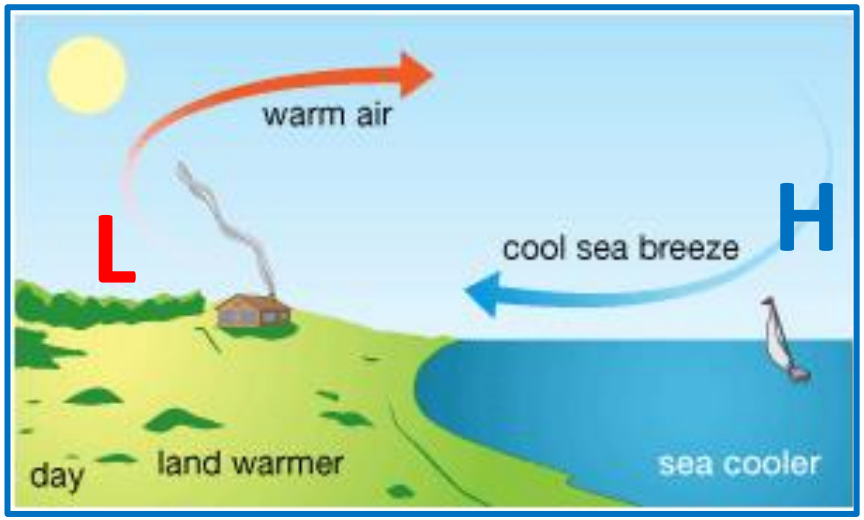
- cover short distances
- blow from any direction

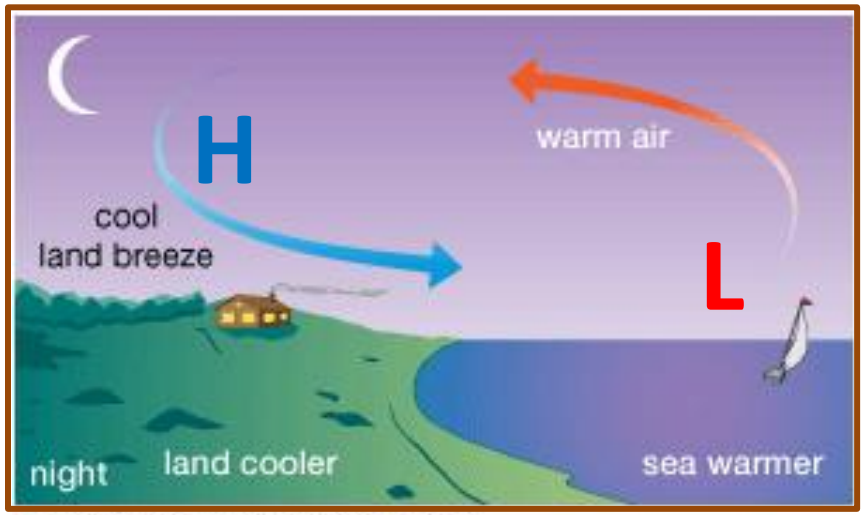

- created and influenced by local conditions, local temperature variations, and local topography.

# Types of Local Winds

**Sea and land breezes are formed by varying temperature differences between the land and water.**

- **During the day the land heats up faster than the water:**
  - **the air above the land warms up and rises, forming a low pressure area;**
  - **the wind will blow from the sea to the land, called a sea breeze.**
- **At night, land cools off faster than the sea:**
  - **the air above the sea surface warms up and rises;**
  - **and the wind will now blow from the land to the sea, called a land breeze.**

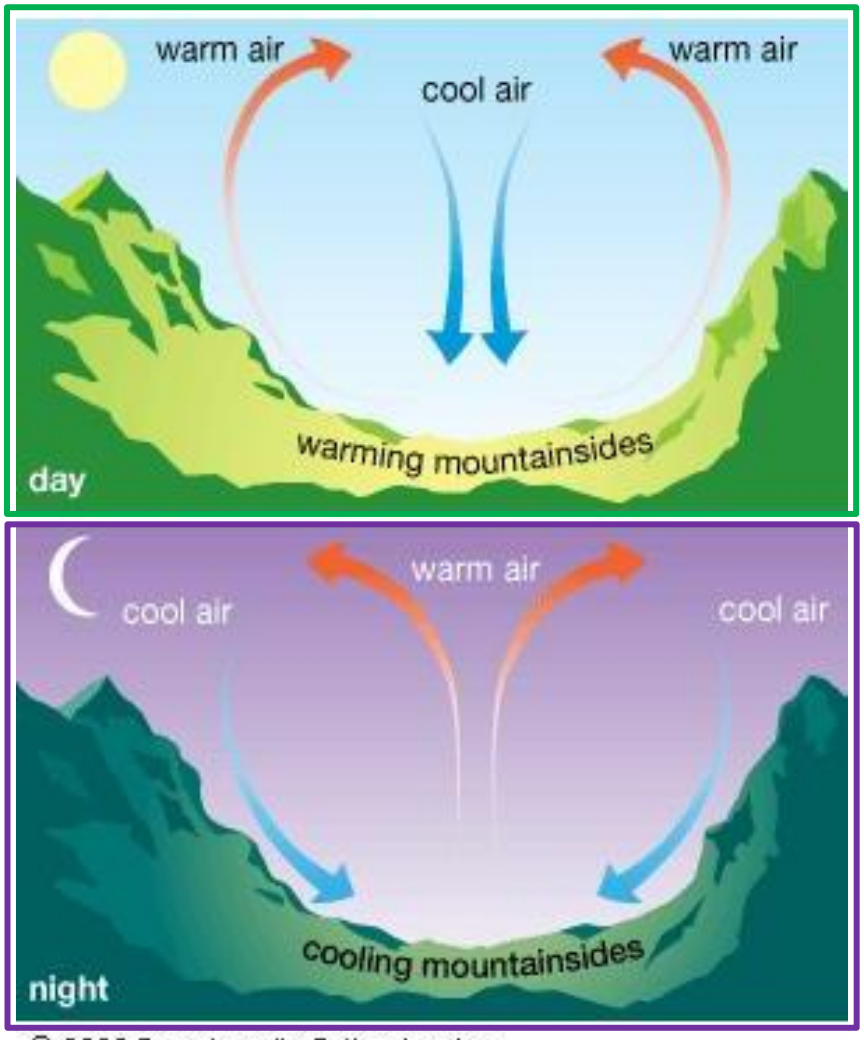


# Types of Local Winds

**Mountain and valley breezes are examples of local winds caused by the topography of an area.**

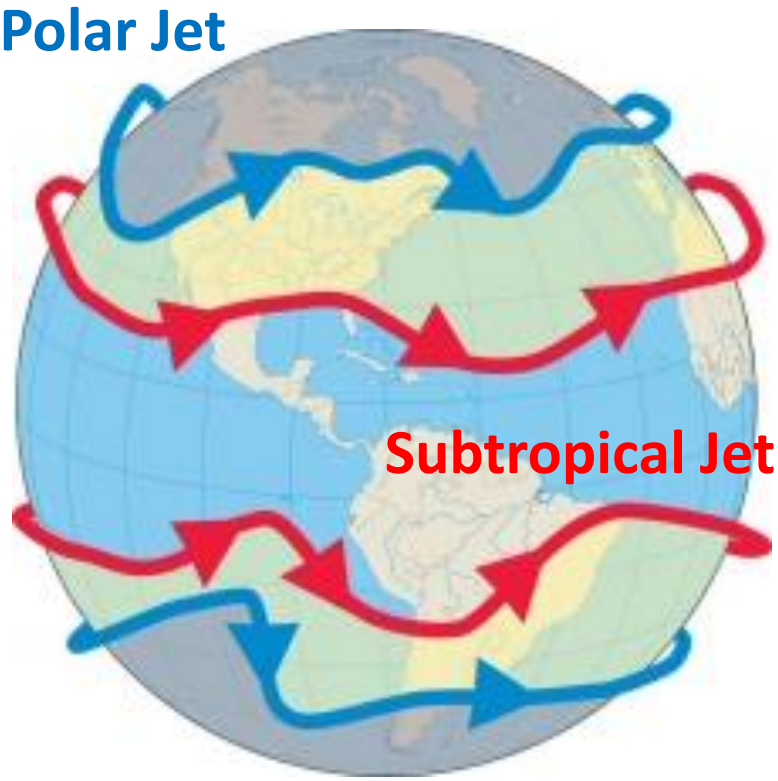
- **During the day the mountain slopes heat up:**
  - **the warm less dense air flows up the mountain;**
  - **this is called a valley breeze.**
- **At night, the mountain will cool off faster than the valley:**
  - **the cool mountain air descends;**
  - **this is called a mountain breeze.**



# Jet Streams

**Jet streams are fast flowing, relatively narrow air currents found in the atmosphere of some planets, including Earth.**

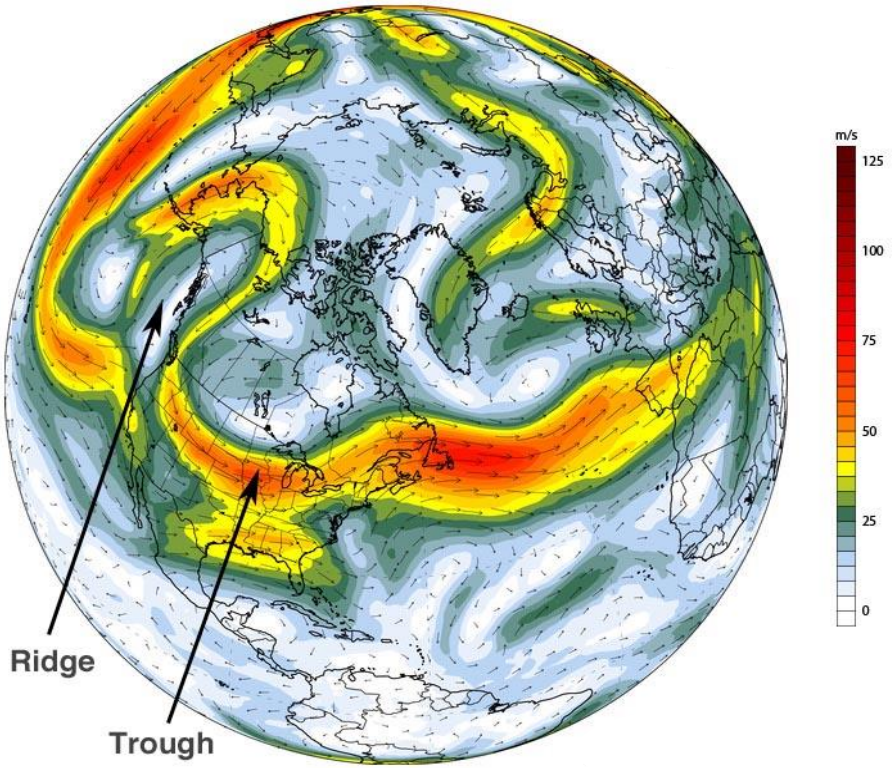
- **Discovered in 1940s.**
- **Can be found in the upper troposphere at ~10-15 km altitude.**
- **Caused by a combination of the Earth's rotation on its axis and uneven atmospheric heating.**
- **Strong, high speed (~50-100 mph).**
- **Major jets move west to east:**
  - **Polar (strongest)**
  - **Subtropical**




- **The polar and subtropical jets merge at some locations and times, while at other times they are well separated.**

# Jet Streams Role

**The path of jet streams steers cyclonic storm systems at lower levels in the atmosphere.**




- **Jet streams develop meanders, that eventually cut off, detaching and moving air masses.**


- **In air travel, flight time can be dramatically affected by either flying with the flow or against the flow of a jet stream.**