**Local Weather 5**

**Outcomes: (115-2)**

**Content: Page 210-211**

## **Regional Weather:**

* As we have seen in the last few lessons the weather conditions you get depend on large weather systems that move across the country.
* However, we also see some weather conditions that are affected by **local geographic features**.
* Living close to **the ocean, a large pond, a mountain range or large hills** will influence your local wind patterns and temperatures.

**Have you ever heard the saying;  "the wind comes and goes with the sun"?**

* This is why fishermen get out on the water early in the morning when it is calm.
* By mid-day, when the **sun is at its strongest the wind picks up and becomes quite breezy**.
* Then in the evening **when the sun begins to set the wind drops off again.**

**Why is this true?**

* It all has to do with **convection currents**.
* Have you ever wondered why the heaters in your house are down near the floor?
  + The answer of course is that **heat rises**.
  + If you lie down on the floor in front of the heater you should feel a **draught of cool air**.
  + This cool air is coming in to **take the place of the warm air that has risen** up away from the heater.
  + The warm air **cycles around warming the room** and as it cools off it drops and makes its way back to the heater to cycle around again.
  + This cycling of rising warm and sinking cool air is called a **convection current.**

**Convection currents are the reason behind some of the local wind patterns that we see such as:**

### **1. Thermals:**

* A **thermal or updraft** is simply a **mass of warm, rising air**.
* Thermals can be created by a small local feature such as a farmer's field or a large paved area like an airport runway.
* During the day the earth is heated by the **hot sun**.
* The warmed earth then **heats the air above it**.
* This warmed air then expands becoming much **lighter and starts to rise**.
* As the warmed air rises, **colder air rushes in underneath** to take its place.
* This creates a convection current in the area of the local heating.

### **2. Sea Breezes:**

* Very similar to a thermal, in the way it is formed, however, sea breezes happen on a much **larger scale**.
* During the day the sun **heats a large land mass**.
* The **hot air would rise up off the land** and cooler air from the surrounding water would rush in and take its place (just like the thermal).
* The cool wind will **blow in from the lake or ocean**.
* As the hot air continues to rise, **it cools and begins to fall**.
* Creating **a large convection current**.

### **3. Land Breeze:**

* During the night time the **sea breeze reverses**.
* At night the **land cools off quickly** while the water tends to be a little warmer than the land.
* In this case, **the convection current is reversed**.
* The warm air rises up off the water while the **cool land air now sweeps out from the land**.
* This creates a **soft offshore wind in the night**.

### **4. Lake Effect Snow:  (Snow squalls)**

* Snow squalls are created when **winds blow over an open body of water** such as a large unfrozen pond, lake, or ocean.
* In winter, **water stays warmer than the land**.
* As this air blows over the water it warms slightly and the air **picks up moisture** from the water.
* When this moist wind blows onshore the land is much colder and **quickly cools the air**.
* This quick cooling causes the air to rapidly **release its moisture in the form of snow**.
* The **snowfalls can be quite large** in the area downwind and around the body of water.

### **5. Chinook:**

* The word Chinook is a Native American name given to a wind, which is known as **"the snow eater"**.
* A Chinook is experienced by areas on the **eastern side of the Rocky Mountains**.
* Warm, moist air from the **Pacific Ocean** blows on shore and begins to rise over the very high Rocky Mountains.
* As this warm, moist air rises it **cools and clouds form**.
* This air continues to rise and starts to release its moisture as **rain or snow**.
* The release of precipitation has a **warming effect on the air**.
* When this air reaches the other side of the mountains it gets trapped underneath a **very cold air mass above**.
* As the heavy cold air mass sinks it pushes this **pocket of warm air underneath it**.
* The warm air then starts to get squeezed together (compressed) which **heats this pocket of air even more**.
* As this warmed air moves through the temperature has been know to change from -20 oC to + 15 oC in a few hours.
* In the middle of a winter deep freeze conditions **rapidly change to a warm spring day in hours**.
* However, rushing in behind this very warm air is an intense cold air mass, which **returns the normal cold winter temperatures.**

**Homework: Page 211: 1, 2, and 4**