

Thursday, June 5, 2014

Chapter 8: Air Masses

Chapter 8: **Air Masses**

- **What is an Air Mass**
 - Source Regions
- **Classification of Air Masses**
 - Moisture
 - Continental (dry)
 - Maritime (wet)
 - Temperature
 - Arctic (very cold)
 - Polar (cold)
 - Tropical (warm)
 - Equatorial (hot)
- **Air Masses Affecting North America**
 - Continental Polar (cP) & Continental Arctic (cA)
 - Maritime Polar (mP)
 - Continental Tropical (cT)
 - Maritime Tropical (mT)
- **Lake Effect Snows**
 - Snowbelts

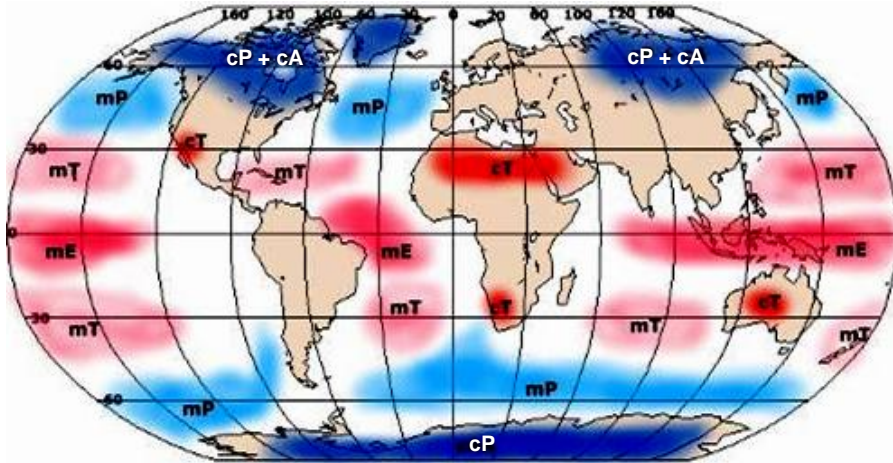
Air Masses

- **What is an Air Mass?**
 - An extensive body of air that has relatively uniform **temperature** and **humidity** derived from a **source region**
- **Source Region**
 - The place where an air mass “gets” its temperature and humidity characteristics
 - Air needs to “sit” over this area to “get” humidity & temp (air stagnates over this area and acquires characteristics)

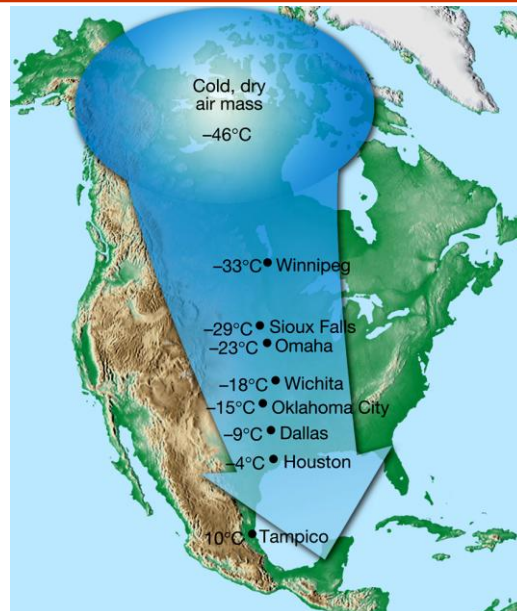
Air Masses

- **Source Region**
 - **Humidity:** Large uniform areas
 - **Land = Continental = Dry**
 - **Water = Maritime = Humid**
 - **Temperature:** Latitude
 - Arctic = Very Cold
 - Polar = Cold
 - Tropical = Warm
 - Equatorial = Hot

Air Masses



Air Masses



Source Regions

- **Moisture:**
 - **m** = Maritime (**Humid**)
 - **c** = Continental (**Dry**)
- **Temperature**
 - **A** = Arctic (**Very Cold**)
 - **P** = Polar (**Cold**)
 - **T** = Tropical (**Warm**)
 - **E** = Equatorial (**Hot**)

Example:

mT

**Maritime
Tropical**

(Humid & Warm)

Source Regions

**Which two air masses really
can not exist even though they
are theoretically possible?**

- **mA** = *maritime arctic*
- mP = *maritime polar*
- mT = *maritime tropical*
- mE = *maritime equatorial*
- cA = *continental arctic*
- cP = *continental polar*
- cT = *continental tropical*
- **cE** = *continental equatorial*

Source Regions

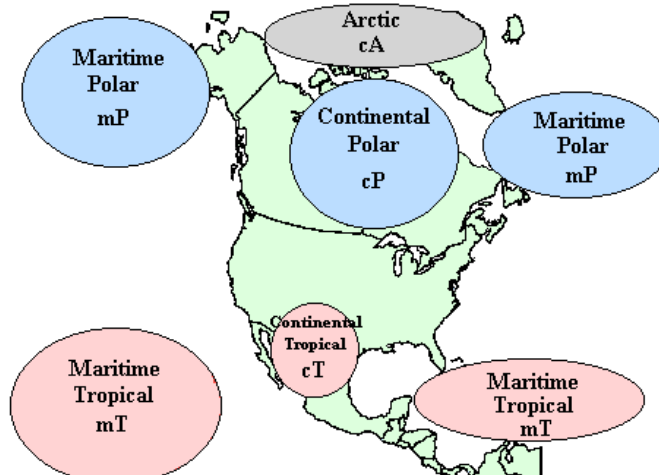
- **mA** = *maritime arctic*
- **mP** = *maritime polar*
- **mT** = *maritime tropical*
- **mE** = *maritime equatorial*
- **cA** = *continental arctic*
- **cP** = *continental polar*
- **cT** = *continental tropical*
- **cE** = *continental equatorial*

Source Regions

- **mA** = *Very Cold and Wet*
- **mP** = *Cold and Wet*
- **mT** = *Warm and Wet*
- **mE** = *Hot and Wet*
- **cA** = *Very Cold and Dry*
- **cP** = *Cold and Dry*
- **cT** = *Warm and Dry*
- **cE** = *Hot and Dry*

Air Masses

North American Air Mass Source Regions

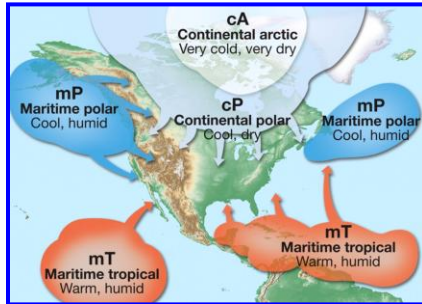


Air Masses Affecting North America

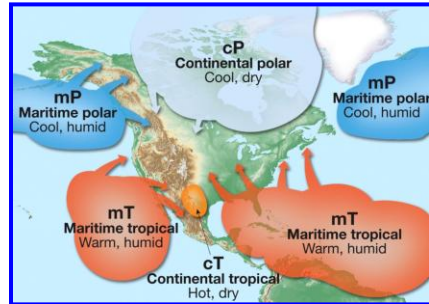
- **Continental Arctic (cA)**
 - Arctic Basin & Greenland
 - Bitterly cold, very dry (winter)
- **Continental Polar (cP)**
 - Interior Canada & Alaska
 - Very cold, dry (winter)
- **Maritime Polar (mP)**
 - North Pacific – Cool, humid (all year)
 - Northwestern Atlantic
 - Cold, humid (winter)
 - Cool, humid (summer)
- **Continental Tropical (cT)**
 - North Mexico & Southwestern US
 - Hot, dry
- **Maritime Tropical (mT)**
 - Gulf of Mexico, Caribbean, Western Atlantic
 - Warm, humid (all year)

Air Masses

Seasonal Variations in Air Masses



Winter Pattern



Summer Pattern

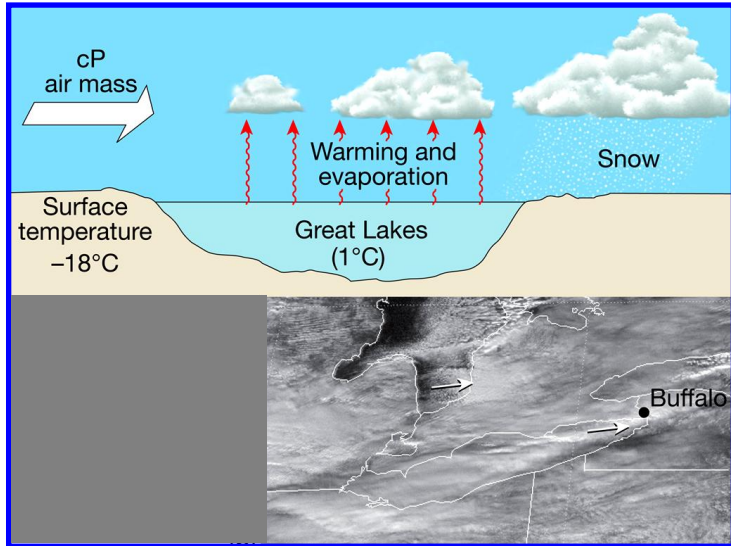
Lake Effect Snow

Lake Effect Snow

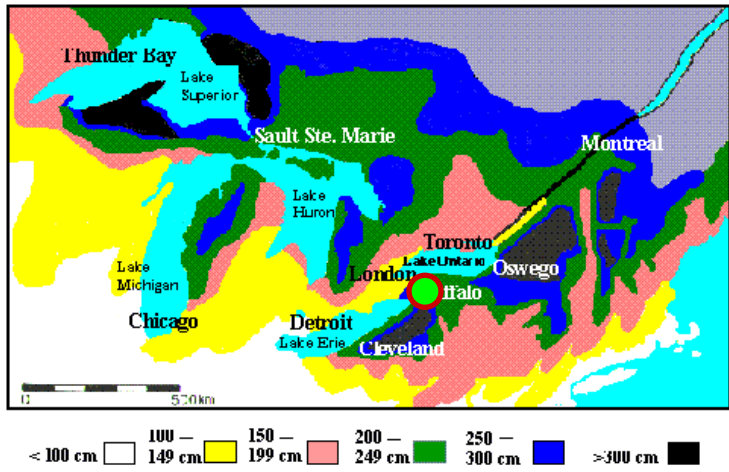
- **Heavy snow that falls on the leeward side of lakes**
- Process
 - Cold, dry air masses move over warmer lakes
 - Air is warmed → can hold more water vapor
 - Evaporation from lakes fills air with water vapor
 - Clouds move off of lakes over colder land
 - Air is cooled → can hold less water vapor
 - Air becomes saturated → precipitation begins (snow)
 - Usually occurs within 50 miles of the lakes
- Buffalo, New York is on the Eastern Shore of Lake Erie
 - From 12/24/01 – 1/01/02...
 - A continuous lake effect snow event...
 - **81.6" of snow!** (record MONTH was 68.4")
 - That is 7 feet 10 inches of snow in one storm!
 - *To put this into context...*
 - **... that is 4 inches taller than Yao Ming!**



Lake Effect Snow

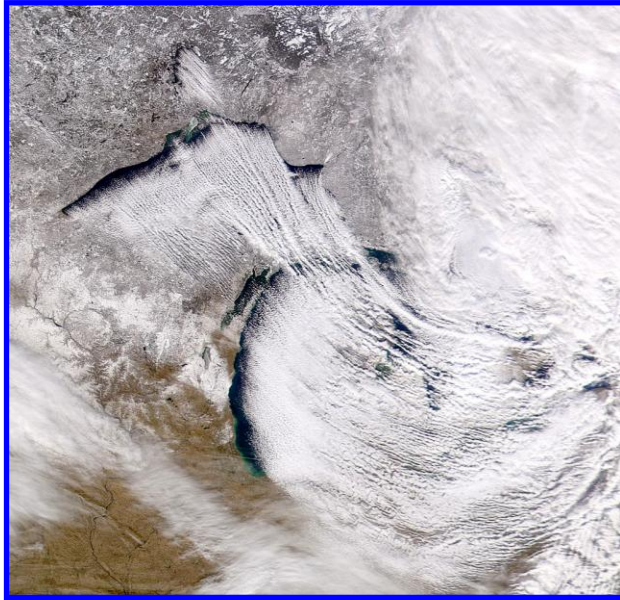


Lake Effect Snow



Mean Annual Great Lakes Snowfall

Lake Effect Snow



Lake Effect Snow

