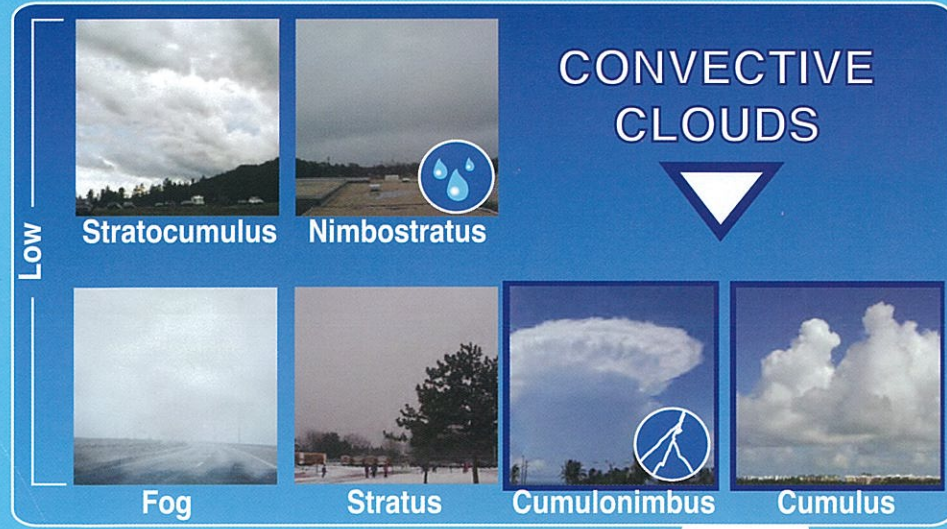
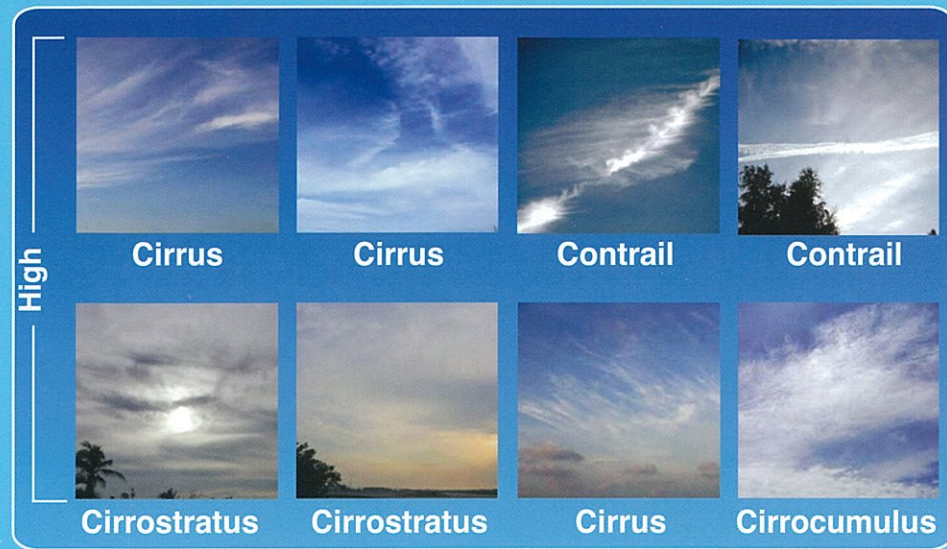


Introduction to Clouds

http://science-edu.larc.nasa.gov/cloud_chart



Convective Clouds form because of large updrafts of warm, moist air moving up into cold air!



Cloud Cover

- Clear (0% - 5%)
- Partly Cloudy (5% - 50%)
- Mostly Cloudy (50% - 95%)
- Overcast (95% - 100%)

Visual Opacity

- Opaque
- Translucent
- Transparent

Cloud Cover

Determination of the amount of cloud cover is done by estimating the percentage of the sky covered with clouds. This is one of several possible scales or categories for cloud cover.

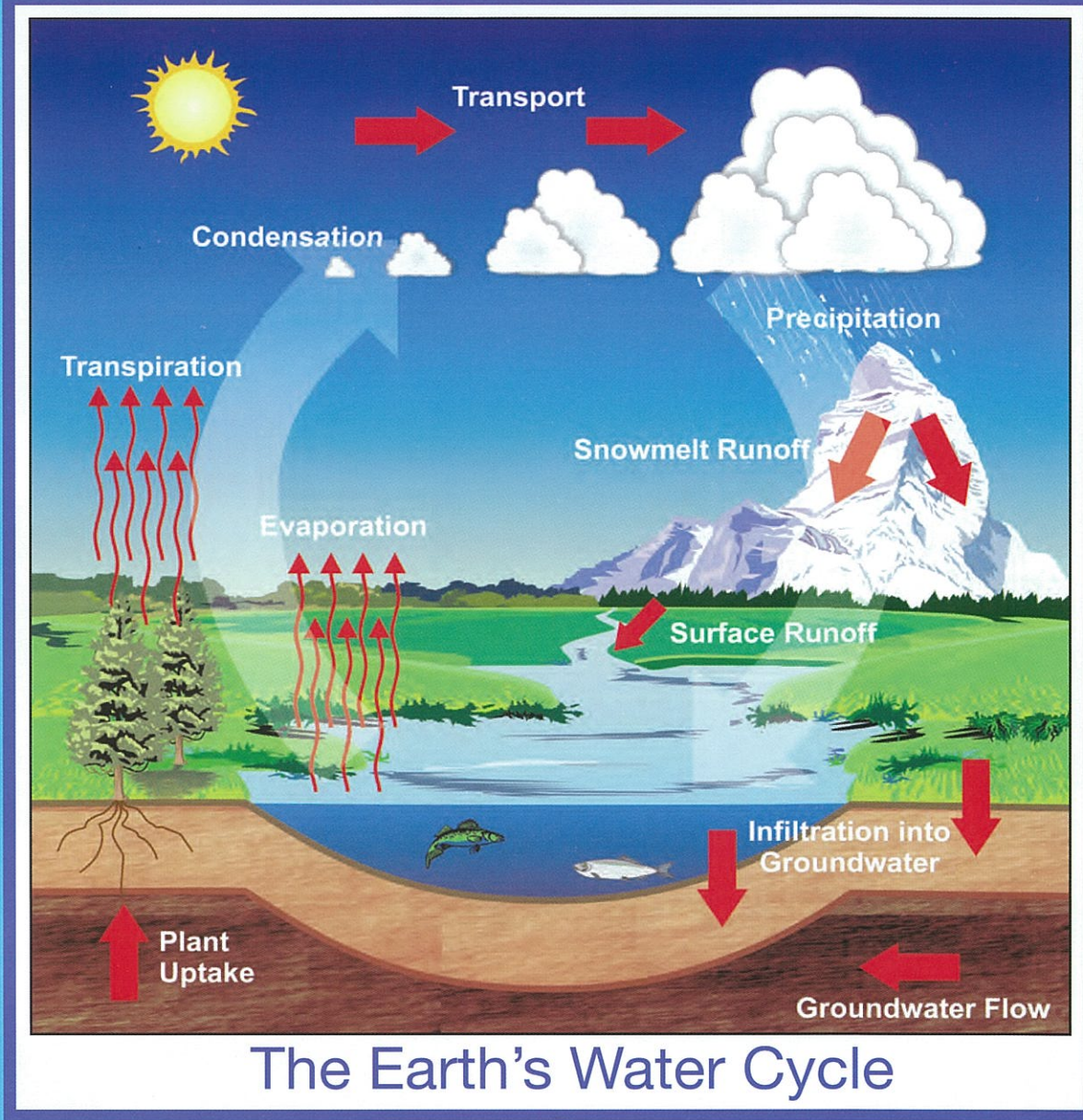
Visual Opacity

The thickness of a cloud determines the amount of light being transmitted through the cloud. Shadows often provide a clue.

Cloud Level

Three levels of clouds have been identified based on the altitude of a cloud's base.

The water on Earth is always on the move, changing state from liquid to vapor back to liquid and snow and ice near the poles and mountains. The process used to describe the continuous movement of water between the Earth and atmosphere is known as the water cycle, and is often referred to as the hydrologic cycle. There is no beginning or end to the water cycle; it behaves much like a Ferris wheel at an amusement park, moving around and around.



Ever wonder how clouds got their names? Well you may be surprised to find out!

In 1803 Luke Howard used Latin terms to classify four main cloud types.

- Cumulus means pile and describes heaped, lumpy clouds.
- Cirrus, meaning hair, describes high level clouds that look wispy, like locks of hair.
- Featureless clouds that form sheets are called Stratus, meaning layer.
- The term Nimbus, which means "precipitating cloud", refers to low, grey rain clouds.
- Alto is used to describe mid level clouds.
- Finally, convective clouds have a vertical development extending through large portions of the atmosphere.



National Oceanic and Atmospheric Administration
<http://www.noaa.gov>
<http://www.weather.gov>
<http://www.education.noaa.gov>
<http://www.srh.noaa.gov/jetstream>
 YPA-200752-L



National Aeronautics and Space Administration
<http://www.nasa.gov>
<http://education.nasa.gov>
<http://school.larc.nasa.gov>
 NP 2007-99-99-LaRC

SKY WATCHER CHART

High Clouds: cloud bases 16,000 - 50,000 ft (5-15 km)

<http://www.weather.gov/os/brochures/cloudchart.pdf>

Typical Types: Cirrus (Ci), Cirrostratus (Cs), Cirrocumulus (Cc)



H1: Cirrus
In the form of filaments, strands, or hooks



H2: Cirrus
Dense, in patches or sheaves, not increasing, or with tufts



H3: Cirrus
Often anvil shaped remains of a cumulonimbus



H4: Cirrus
In hooks or filaments, increasing, becoming denser



H5: Cirrostratus
Cirrus bands, increasing, below 45° elevation



H6: Cirrostratus
Cirrus bands, increasing, veil above 45° elevation



H7: Cirrostratus
Translucent, completely covering the sky



H8: Cirrostratus
Not increasing, not covering the whole sky



H9: Cirrocumulus
Alone or with some cirrus or cirrostratus

Middle Clouds: cloud bases 6,500 - 23,000 ft (2-7 km)

Typical Types: Altostratus (As), Alto cumulus (Ac), Nimbostratus (Ns)



M1: Altostratus
Mostly semi-transparent, sun or moon may be dimly visible



M2: Altostratus or Nimbostratus
Dense enough to hide the sun or moon



M3: Alto cumulus
Semi-transparent, one level, cloud elements change slowly



M4: Alto cumulus
Lens-shaped, or continually changing shape and size



M5: Alto cumulus
One or more bands or layers, expanding, thickening



M6: Alto cumulus
From the spreading of cumulus or cumulonimbus



M7: Alto cumulus
One or more opaque layers, w/ altostratus or nimbostratus



M8: Alto cumulus
With cumulus-like tufts or turrets



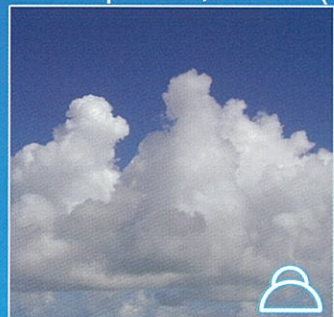
M9: Alto cumulus
Chaotic sky, cloud bases at several levels

Low Clouds: cloud bases up to 6,500 ft (0-2 km)

Typical Types: Stratus (St), Stratocumulus (Sc), Cumulus (Cu), Cumulonimbus (Cb)



L1: Cumulus
Cumulus of fair weather with flattened appearance



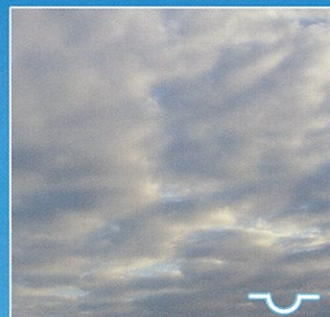
L2: Cumulus
Moderate/strong vertical extent, or towering cumulus



L3: Cumulonimbus
Tops not fibrous, outline not completely sharp, no anvil



L4: Stratocumulus
From the spreading and flattening of cumulus



L5: Stratocumulus
Not from the spreading and flattening of cumulus



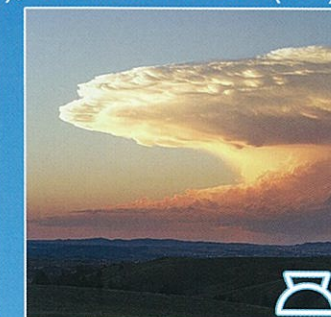
L6: Stratus
In a continuous layer and/or ragged shreds



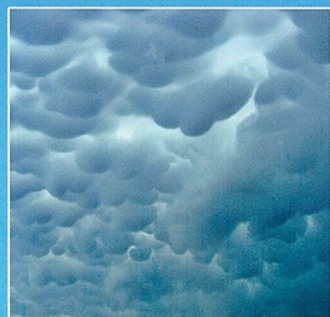
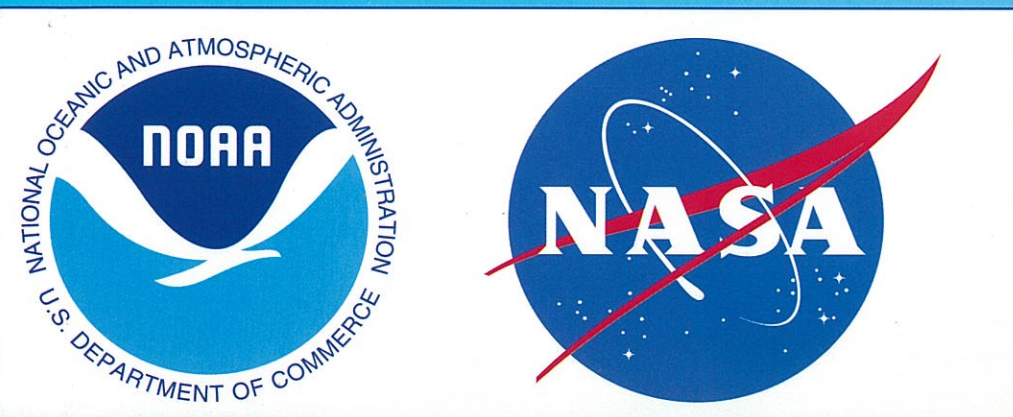
L7: Stratus Fractus
and/or Cumulus Fractus occurs with rain or snow



L8: Cumulus & Stratocumulus
Not spreading, bases at different levels



L9: Cumulonimbus
With fibrous top, often with anvil



Mammatus
Drooping underside of heavy, rain-saturated clouds



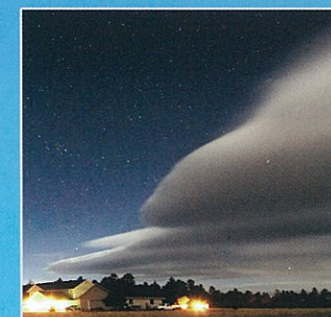
Tornado
Rapidly rotating column under a cumulonimbus cloud that touches the ground



Wall Cloud
Lowering of the rain free base of a thunderstorm, often prior to tornado formation



Shelf Cloud
Represents the leading edge of strong winds in advance of a thunderstorm



Wave Cloud
Formed by strong horizontal winds over uneven terrain

