Chapter 6, Part 2

Clouds

Major Cloud Groups and Types

• High clouds
  – **Cirrus (Ci)**
  – **Cirrostratus (Cs)**
  – **Cirrocumulus (Cc)**

• Middle clouds
  – **Altostratus (As)**
  – **Alto cumulus (Ac)**

• Low clouds
  – **Stratus (St)**
  – **Stratocumulus (Sc)**
  – **Nimbostratus**

• Clouds with vertical development
  – **Cumulus (Cu)**
  – **Cumulonimbus (Cb)**

Height of Cloud Bases

<table>
<thead>
<tr>
<th></th>
<th>Tropics</th>
<th>Middle Lat.</th>
<th>Polar</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>20,000 to 60,000 ft</td>
<td>16,000 to 43,000 ft</td>
<td>10,000 to 26,000 ft</td>
</tr>
<tr>
<td>Middle</td>
<td>6,500 to 26,000 ft</td>
<td>6,500 to 23,000 ft</td>
<td>6,500 to 13,000 ft</td>
</tr>
<tr>
<td>Low</td>
<td>surface to 6,500 ft</td>
<td>surface to 6,500 ft</td>
<td>surface to 6,500 ft</td>
</tr>
</tbody>
</table>

Note how cloud heights lower at higher latitude.
**Cirrus Clouds**

- Wispy clouds blown by the wind into long streamers
- Generally point to fair weather
- Like other high clouds composed largely of ice crystals

See Figure 6.10

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**Cirrocumulus Clouds**

- Small rounded white puffs which occur individually or in rows
- Seldom cover the entire sky

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**Cirrostratus Clouds**

- Thin sheets of clouds
- Often cover entire sky
- Sun and moon visible through them
Altocumulus Clouds

- Gray and puffy, sometimes in parallel bands
- May indicate later thunderstorms
- Composed mostly of water droplets and some ice, depending on temperature

Altostratus Clouds

- Gray or blue-gray cloud
- Often covers entire sky
- Composed of ice and water

Nimbostratus Clouds

- Dark gray cloudy layer
- Continuous light to moderate rain or snow
Stratocumulus Clouds

- Low lumpy clouds with blue sky visible between them

Stratus Clouds

- Uniform grey cloud that covers the entire horizon
- Usually no precipitation, but may be mist or drizzle

Cummulus Clouds

- Looks like floating cotton with a flat base
- Blue sky visible between them
Cumulonimbus Clouds

- Thunderstorm cloud
- Large vertical extent, e.g., 600m - 10,000m
- Isolated or part of a line of clouds

See Figure 6.20

Illustration of Basic Cloud Types

Determining Sky Conditions

<table>
<thead>
<tr>
<th>Description</th>
<th>Fraction</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clear</td>
<td>0</td>
<td>No clouds</td>
</tr>
<tr>
<td>Few</td>
<td>0 to 2/8</td>
<td>Few clouds visible</td>
</tr>
<tr>
<td>Scattered</td>
<td>3/8 to 4/8</td>
<td>Partly cloudy</td>
</tr>
<tr>
<td>Broken</td>
<td>5/8 to 7/8</td>
<td>Mostly cloudy</td>
</tr>
<tr>
<td>Overcast</td>
<td>8/8</td>
<td>Sky is covered by clouds</td>
</tr>
<tr>
<td>Sky obscured</td>
<td>--</td>
<td>Hidden by fog, smoke, ...</td>
</tr>
</tbody>
</table>
Satellite Observations

Infrared images can distinguish between low clouds (dark) & high clouds.

Summary

• Clouds are classified by height and vertical structure into four groups.
• There are ten basic cloud types, which you should know.