

# Significant Atmospheric Levels

Meteorology 111

Fall 2017

# 500mb Charts

- Far away from the influence of the surface.
- Typically produced every 12 hours.
- Rawinsondes (Radiosondes)
  - Flown at standard times by international agreement (00Z and 12Z).

# Heights

- Horizontal wind flows parallel to the height contours
  - Low pressure to the left in the northern hemisphere.
- Speed  $\propto 1 /$  (spacing of height contours)
- Low heights  $\rightarrow$  cold air mass, high heights  $\rightarrow$  warm air mass.
- Movement of troughs and ridges  $W \rightarrow E$ , same as general direction of the wind.
- Longwaves: Generally 3-7 around the Earth.
- Shortwaves: Small scale troughs and ridges superimposed on the longwaves.

# 850 mb

- ~5000ft (1500m) MSL.
- Three locations
  - Underground
  - PBL (planetary boundary layer)
  - Free atmosphere
- Temperature advections
- 0°C line
  - Above freezing → rain at surface
  - Below freezing → wintery mix or snow possible

# 700 mb

- ~10,000ft MSL (3000m)
  - >70%: clouds
  - > 90%: precipitation
- Like 850mb, height contours are every 30 m, or 3dm.
- Isotherms typically every 5 °C.

# 500mb

- Middle of the atmosphere.
- ~18,000ft MSL (5520m)
- Longwave and shortwaves
- Vorticity
- Surface lows move about 50% of the 500mb wind speed directly above the low.
- Height contours drawn every 60m.

# 300/250/200 mb

- Locations of jet streams and jet streaks
  - Winter: 300 mb
  - Summer: 200 mb
  - Transition seasons: 250 mb
- Height contours every 120 m (12 dm)
- As with all upper air plots, dew point depressions plotted, not the actual dew point.
  - $T_d = T - dd$ , where  $dd$  = dew point depression.