

October 14, 2015

### **Finishing up Unit 9**

Atmospheric circulation, zonal vs. meridional flow, hypothetical flow on a non-rotating earth, equatorial lows/ITCZ, subtropical high, northeast trade and southeast trades, westerlies, polar highs, polar easterlies, polar front, subpolar low, jet streams, Hadley Cells, latitudinal movement north & south during the year, Bermuda and Pacific Highs, polar cell, Canadian and Siberian Highs, Aleutian, Icelandic, and Southern Hemisphere Subpolar Lows; Secondary surface circulation such as monsoons; Circulation of the Upper Atm, zonal flow, polar and subtropical jet streams (also equatorial jet),

### **Unit 10**

Ocean circulation; mixed layer, thermocline, deep ocean, generation of ocean currents by surface winds, Coriolis and the oceans, and density differences, gyre circulations, warm currents, upwelling, deep-sea currents and thermohaline circulation, ENSO & other oscillations

### **Unit 11**

Atmospheric moisture and the water balance; physical properties of water, physical states of water and the energy exchanges between them, water vapor, melting, latent heat of fusion, evaporation, latent heat of vaporization, sublimation, condensation, freezing, deposition. Humidity, vapor pressure, dew, dew-point temperature, relationship of saturation vapor pressure and temperature, specific humidity, relative humidity, sling psychrometers. "Mountain Problem" of adiabatic rates and humidity. The hydrologic cycle, hydrosphere, precipitation, runoff, groundwater, and water use. Evapotranspiration, potential and actual evapotranspiration, clouds, condensation, and condensation nuclei, example of weekend rain. Basic cloud types – stratus, cumulus, cirrus, and height modifiers such as altostratus and cirrostratus, and nimbostratus, cumulonimbus for rain clouds. Precipitation, formation mechanisms including the ice-crystal (or Bergeron) effect and collision coalescence, forms of precipitation, rain, snow, sleet, freezing rain, hail, The concept of the water balance, global variations in the water balance.

### **Unit 12 (If we have time)**

Air masses, source regions, maritime tropical, continental tropical, maritime polar, continental polar, continental arctic, maritime equatorial, movements of air masses. Lifting mechanisms; convergent-lifting precipitation, ITCZ, frontal precipitation – fronts, warm fronts, cold fronts; convective precipitation, air-mass thunderstorms; orographic precipitation, rain shadow effect.