

October 7, 2015

Finishing up Remaining Items in Units 6 and 7

Climate vs. weather, photochemical reactions, isotopes such as N^{15} , trace gases, ppm (CO_2 + ~ 390 ppm), ppb (CH_4 = ~ 1800 ppb), homosphere, heterosphere, constant vs. variable gases, history of atmospheric gases, CO_2 variability, H_2O , O_3 issues, ozone hole, aerosols, troposphere, tropopause, lapse rate, stratosphere, temperature inversions, stratopause, mesosphere (ionization, auroras), mesopause, thermosphere; Celsius vs. Fahrenheit vs. Kelvin, environmental lapse rate (6 deg 1000m average only!), concept of atmospheric stability, dry adiabatic lapse rate (10 deg C/1000m), saturated (or moist/wet) adiabatic lapse rate (4 – 9 deg C/1000m), condensation. $ELR > DALR$ [unstable], $ELR < SALR$ [stable], $DALR > ELR > SALR$ [conditionally unstable] – conditionally unstable means unstable if condensation occurs & stable otherwise, weather balloons, assessing stability by looking at the atmosphere, temperature inversions and air pollution, urban dust domes; horizontal distribution of temperatures: daily and yearly cycles, land/water heating differences, maritime effect vs. continentality, advection, isotherms, temperature gradient

Unit 8

Wind and Pressure, what causes pressure, barometer, pressure vs. altitude, Causes of Atmospheric Circulation: (1) spatially unequal net radiation, (2) earth's rotation around its axis, (3) frictional drag on the air by the earth. Mapping of pressure & isolines, Pressure Gradient Force, Coriolis Effect (and its latitudinal variation), Frictional Force (only effective up to 2000 up into the atm), geostrophic winds vs. surface winds, cyclones and anticyclones, sea and land breezes, mountain/valley breeze systems, cold air drainage and katabatic winds, Chinook & Santa Ana winds

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 density differences, gyre circulations, warm currents, upwelling, deep-sea currents and thermohaline circulation, ENSO & other oscillations