

BASICS of ENVIRONMENTAL SYSTEMS

EARTH'S SPHERES (review)

atmosphere: thin gaseous veil which surrounds the Earth

hydrosphere: all the water above, on, and in the Earth in all 3 states;
includes fresh and saline(salt)

lithosphere: Earth's crust and a portion of the upper mantle

biosphere: interconnection between the living organisms of the
planet with their physical environment

THE ATMOSPHERE

* a mixture of discrete gases with solid and liquid particles suspended in it

* Some components are fairly stable while others vary spatially and temporally

** **constant gases:** found in same proportions within lower atmosphere. Percentage the same, not the numbers!!

Constant Gases: 3 gases make-up just under 100% of the atmosphere

Nitrogen (N): ~ 78% Oxygen (O₂): ~ 21% Argon (Ar): ~ .9% ***know these percentages!!**

** **variable gases:** present in differing amounts spatially and/or temporally

Variable Gases: 4 which influence weather and life systems

Carbon dioxide (CO₂)greenhouse gas, Water vapor (H₂O), Ozone (O₃)NOT a greenhouse gas! blocks out some the solar radiation coming in, allowing less sunlight through, Methane (CH₄) greenhouse gas

There is a rise in carbon dioxide levels and methane levels in the atmosphere.

Ozone Hole- ozone depletion, more sunlight gets in. Ozone hole around both the arctic and antarctic circle

HYDROSPHERE

* WATER (H₂O)

* originally formed within the earth & brought to surface by *outgassing* , also known as *degassing*

* collected on surface after earth cooled some 3.8 BYBP

* covers 71% of earth by area * constitutes 70% of our bodies

* **Distribution**

* 97.22% is in the oceans and other saltwater bodies, 2.78% is **freshwater**. * **know these percentages!**

* of this freshwater: **77% is in ice & glaciers**, **22% is groundwater**, about 1% is in freshwater lakes & ponds, rivers & streams

** HYDROLOGIC CYCLE

gas to solid- deposition

solid to gas-

evapo-transpiration-water lost by plants (water vapor from vegetation)

* *condensation*

* *precipitation-impacts climate change*

* *run-off- what's in the rivers, lakes*

* Why important? provides adequate water supply

LITHOSPHERE

Uppermost portion of mantle, plus the crust

* varies between 25 and 50 mi thick

Things we get out of it, minerals, soil, rocks

Know that there are 2 different kinds of crust

Continental crust

vs

Oceanic crust

- * usually lower density
- * **sialic** rock or **sial**
(Si & Aluminum)
- * ex: granite, shale, marble

- * higher density
- * **simatic** rocks or **sima**
(Si & Magnesium)
- * ex: basalt, lava

The Crustal Surface

**** Topography or topographic relief:** the vertical difference between highest elevation and lowest elevation ****know this definition**

- * high relief (mountains) vs. low relief (coastal plain)

*** Earth's relief:

- * highest point above sea level: Mt. Everest, 29,035 ft *don't have to know exact height.
- * lowest point below sea level: Mariana Trench, -36,198 ft
- * total relief: 65,226 ft, about 12.5 mi

BIOSPHERE

- * the **flora** (plants), **fauna** (animals), & other **living organisms**
- * **biodiversity or biological diversity:** the variety of life forms, the ecological roles they perform and the genetic diversity they contain. ****Know this**

Plants and animals are important but so are the soil, air, environment.

* Processes:

- * photosynthesis
- * energy flow within & between systems
- * ecological efficiency; trophic levels, food webs
- * plant & animal succession

****Look at all the interactions, not just one part! Mess up one part, mess up all the other parts.**

Basic Building Blocks: