The Spheres Model

One way to make sense of Earth/Space Science is to view Earth as being composed of a number of interacting “spheres.” The main ones are listed below along with a sphere representing the influence of space:

- geosphere (rock)
- atmosphere (air)
- hydrosphere (water)
- cryosphere (ice)
- biosphere (life)
- exosphere (space)

Earth is a fascinating place in large part because we have more spheres than many other places (such as the planet Mercury). More spheres means more interactions.

Consider these examples of interacting spheres:

Two spheres:

- Geo-Atmo (formation of desert sand dunes due to wind erosion)
- Geo-Cryo (formation of a U-shaped valley due to glaciation)
- Cryo-Atmo (production of a cold front due to air cooling over Antarctica)

Three spheres:

- Hydro-Bio-Exo (Most ocean life exists near the ocean’s surface, where sunlight can reach.)
- Geo-Atmo-Hydro (formation of a limestone cave due to water loaded with dissolved minerals and gases)

Four spheres:

- Hydro-Geo-Bio-Atmo (tube worms found around geothermal vents, a.k.a. black smokers, at great depths in the ocean)

Six spheres:

- Exo-Atmo-Geo-Hydro-Cryo-Bio (asteroid hitting Earth in an ocean and cooling the planet dramatically by vaporizing water and rock, wiping out many life forms as a new ice age is triggered)