

A Lexicon of the Spheres

Anthroposphere. “Human societies, cultures, knowledge, economies and built environments” (Raupach and Canadell 2010).

Atmosphere. A layer of gases surrounding Earth and retained by the planet’s gravity.

Biosphere. The sum total of all living things on Earth. It was originally defined by Suess as the place on Earth's surface where life dwells. However, in the context of biogeochemical cycling (according to Vernadsky, 1945), it is more appropriate to identify it as an evolving life system which operates as a geological force transforming the planet's surface and maintaining the global biogeochemical cycles.

Cybersphere. All information and contacts available over the Internet.

Ecosphere. Encompassing both the biological and physical components of the planet. The ecosphere initially was the purely physical geosphere, atmosphere, and hydrosphere. Over the last 4 billion years it has come to include the biosphere and the technosphere (Gillard 1969).

Gaia. The living Earth system including geosphere, atmosphere, hydrosphere, and biosphere.

Gaia 2.0 The living Earth system including the recently evolved technosphere (Lenton and Latour 2018).

Geosphere. Broadly defined as the solid part of the Earth. More formally can be differentiated into the lithosphere (surface, crust and mantle) and the core.

Hydrosphere. It consists of water on Earth in all forms: the ocean (which is the bulk of the hydrosphere), other surface waters including inland seas, lakes, and rivers; rain; underground water; ice (as in glaciers and snow); and atmospheric water vapor (as in clouds).

Ionosphere. The uppermost part of the atmosphere, distinguished because it is ionized by solar radiation.

Lithosphere. The outermost layer of rock on the planet. The lithosphere is divided into tectonic plates which move independently of each other.

Magnetosphere. The region around the Earth in which phenomena are dominated or organized by its magnetic field.

Noösphere. The Earth system under the influence of a conscious (self-aware) humanity. There are alternative interpretations of the concept from Teilhard de Chardin and Vernadsky (Turner 2005).

Pedosphere. The layer of soil on the Earth's surface.

Physiosphere. All material components of the Earth system.

Semiosphere. The sphere of signs and symbols. The concept is developed in a collection of Lotman's writings published in English under the title "Universe of the Mind: A Semiotic Theory of Culture" (Lotman 1990).

Sociosphere – All human beings on the planet and all their interrelationships.

Stratosphere. The second layer of Earth's atmosphere, just above the troposphere, and below the mesosphere. Important in relation to the biosphere because ozone in the stratosphere absorbs most of the damaging ultraviolet radiation in unfiltered sunlight.

Technosphere. The sum of all human artifacts including buildings, roads, machines, and electronic devices. Humans and their institutions are a part of the technosphere (Haff 2014). It is maintained by a flow of material and energy from the geosphere, biosphere, and sun.

Technobiosphere. The integration of the human generated technosphere with Earth's biosphere has resulted in a technobiosphere (Turner 2011). The technobiosphere now influences global atmospheric chemistry and climate.

Troposphere. The lowest layer of the atmosphere (heights to 20 km). It contains approximately 75% of the atmosphere's mass. There is active exchange of mass and energy with the planet's surface.

References

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