

Transcript of the Video

Magda Bou Dagher Kharrat

Slide #1

The term biosphere is a contraction of the two Greek root words bios meaning "life" and sphaîra: sphere / or globe to refer to the earth globe.

It is therefore the set of living organisms on our planet and the space they occupy, in other words, any place on our planet Earth where there are living beings.

Slide #2

This biosphere consists of 3 parts:

- The atmosphere: the first 20 km of the atmosphere above our heads,
- The lithosphere: or the part of the earth's crust in and on which life exists.
- And the hydrosphere that encompasses all the waters of our planet whether fresh or salt, flowing or stagnant.

Slide #3

The atmosphere

The atmosphere is made up of several layers. We will focus here on the thin film of gas that surrounds the earth where the gases that form it are emanations from the earth itself. This layer is called TROPOSPHERE, it is the seat of activity of living beings. It is thicker at the equator (13-16 km) than at the poles (7-8 km) and it is in this layer that meteorological phenomena, rain, thunder, lightning, storms and it is where airplanes travel.

The atmosphere is vital! No atmosphere, no greenhouse effect, no life on earth. The term "greenhouse effect" has a negative connotation relative to the terrible global warming that our planet is currently experiencing. But be aware that if life is possible on Earth it is thanks to this greenhouse effect that the temperature on its surface is neither too cold nor too hot. Without the atmosphere the temperature on earth would be -18°C. whereas thanks to this atmosphere the average temperature of the earth is around +15°C. The greenhouse effect is therefore vital but it is its accentuation that is harmful to us! To distinguish between these two notions, we will then speak of the "anthropogenic" greenhouse effect.

Slide #4

The lithosphere

The lithosphere is the rigid envelope of the Earth's surface that includes the crust and upper mantle, which make up the hard and rigid outer layer of the Earth.

Slide #5

The Earth's lithosphere is both continental and oceanic. The Earth's crust is divided into a number of tectonic plates, also called lithospheric plates.

Slide #6

Everything we know as living beings is on the lithosphere.

Slide #7

Not only on the surface but also IN the soil where millions of life forms evolve and make the soil fertile. Yes the soil is alive.

Slide #8

The hydrosphere refers to all water on Earth, whether it is in liquid, solid or gaseous form; fresh, brackish or salty; flowing or stagnant.

Water provides shelter and food for a wide range of plant and animal organisms, enabling the establishment of complex and balanced food chains.

Slide #9

One should not conceive these 3 subdivisions The atmosphere, the lithosphere, and the hydrosphere as independent! Indeed, the biosphere is the seat of a constant interaction between the environment and the organisms that live there.

The biosphere's living conditions are maintained thanks to physico-chemical cycles (carbon, water, nitrogen cycles, etc.) that allow elements to circulate between the environment and living beings.

Slide #10

The biosphere is the seat of a constant interaction between the physical environment and its abiotic (non-living) factors, whether climatic or non-climatic, and biotic factors (living beings) and their variability.

The environment influences living beings, their distribution, life cycle, reproduction, dormancy etc... and in turn these living beings shape the environment in which they live.

Slide #11

These interactions can be as basic as a food web. On this slide the food chain begins with primary producers such as the algae living in the pond which feeds the mosquitoes which in turn are eaten by the frogs The interdependence of several food chains forms a food web. The more complex the network, the more resilient the ecosystem is.

Slide #12

Food networks are not the only forms of interaction, here are some examples: competition, parasitism, predation, commensalism, mutualism or amensalism.... (TD related to these interactions)

Slide #13

The biosphere has been shaped by these interactions for MILLIONS of years! And the history of their presence on Earth and their evolution is very old. Dictated by all the geological and climatic events that our planet has known even before the appearance of mankind.

Slide #14

If you relate the history of life on earth to 1 hour of time, you will notice that the appearance of the human species dates from the very last seconds compared to other forms of life whose presence is much older.

Slide #15

For more than 275,000 years since the appearance of our species, we were a species like any other we hunted and gathered for food. It is from the Neolithic period - around 12,000 - that human civilization became sedentary by domestication of plants and animals and since then our technology has not stopped evolving at times in such a dazzling way that for the first time in the history of the Earth a species is changing its face!

Slide #16

We have disturbed the biogeochemical cycles of our planet so much that we have decreed this new anthropocene area!

It is a term of geological chronology proposed to characterize the time in Earth's history that began when human activities had a significant global impact on the Earth's ecosystem.

Slide #17

Biodiversity is weakened by human activities. It is declining almost everywhere in the world. Human population densities continue to increase. This translates into a continuous and rapid acceleration in the use of space and an increase in pressures on ecosystems and the species they contain. Pollution, the introduction of invasive species, overexploitation of natural resources, degradation, fragmentation and loss of habitats are all factors responsible for the erosion of biodiversity. Exacerbated by climate change, this anthropisation threatens to destroy the fragile balance of ecosystems and the biodiversity they contain.

Slide #18

The UNESCO program, Man and the Biosphere, launched in 1970, its objective is to preserve for present and future use, the diversity and integrity of animal and plant biotic communities within natural ecosystems, and to safeguard the genetic diversity of species on which their continued evolution depends.

Biosphere reserves are sites designated by national governments and recognized by UNESCO. They are learning sites for sustainable development.

Slide #19

Biosphere reserves allow ecological research and in particular basic studies in natural environments as well as in degraded environments. The purpose of these sites is to reconcile the conservation of natural and cultural diversity with economic and social development. They enable innovative approaches to sustainable development to be tested and developed from the local to the international level.

Biosphere reserves must fulfill three major functions:

1. Conservation function - contributing to the conservation of landscapes, ecosystems, species and genes.
2. Development function - to promote economic and human development that respects socio-cultural and environmental particularities.
3. Logistical function - to encourage research, monitoring, education and information exchange on local, national and global conservation and development issues.

Biosphere reserves are organized into three interconnected zones: the core area, buffer zone, and transition area, and only the core area must be protected by national legislation.