

THE HYDROSPHERE

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HYDROSPHERE

The **hydrosphere** consists of all of the water on or near the earth's surface. It is found as *liquid water* (on the surface and underground), *ice* (polar ice, icebergs, and ice in frozen soil layers called *permafrost*), and *watervapor* in the atmosphere. Most of this water is in the oceans, which cover about 71% of the globe.

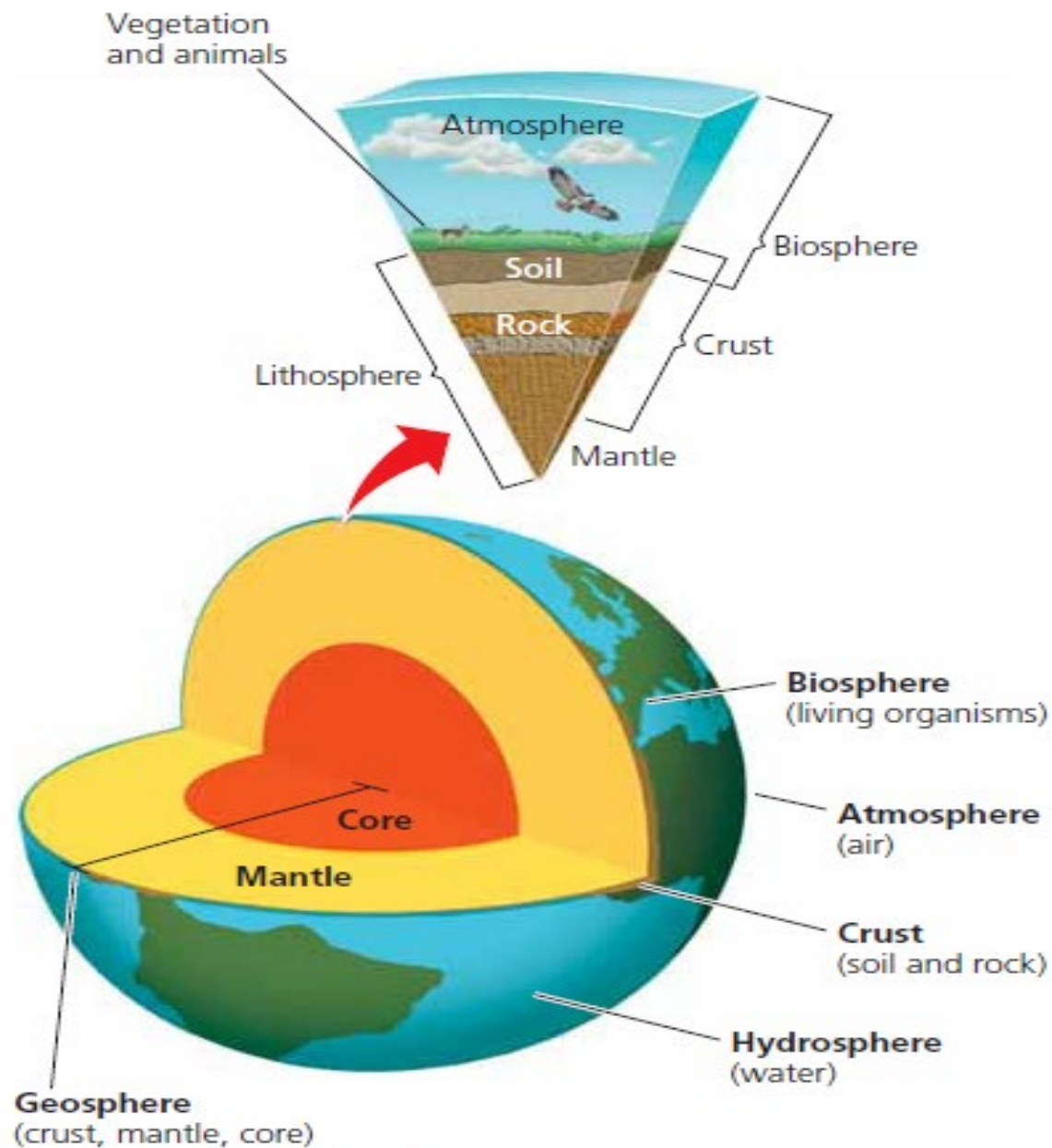


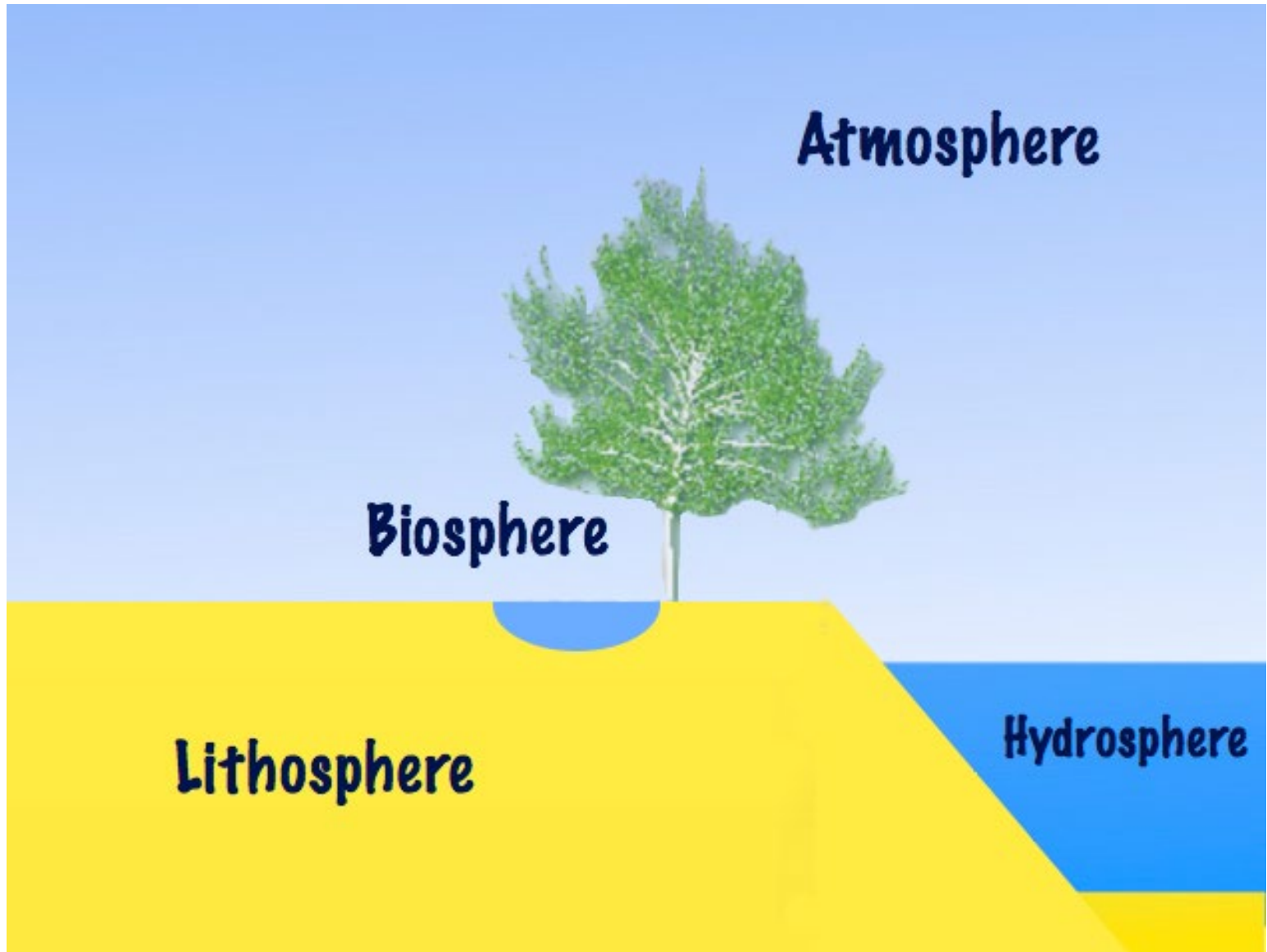
Figure 3-6 Natural capital: general structure of the earth showing that it consists of a land sphere, air sphere, water sphere, and life sphere.

Atmosphere

Biosphere

Lithosphere

Hydrosphere



- Scientists divide the watery parts of the biosphere into **aquatic life zones**, each containing numerous ecosystems. There are *freshwater life zones* (such as lakes and streams) and *ocean or marine life zones* (such as coral reefs and coastal estuaries). The earth is mostly a water planet with saltwater covering about 71% of its surface and freshwater covering just 2%.

Realms of Water

- Total volume of water available , 97% is in the vast oceans, 2% stored in the form of ice and less than 1% is available as fresh water.
- The oceans contain all but 3% of the total amount of water .Salinity and temperature are two important features ocean water which determine water types, its characteristics , movement , flora and fauna. Largest ocean is Pacific ocean covering one third of earth's surface.

- Temperature decreases with increasing depth and range from -5 to over 33 degree Celsius and mainly affect flora and fauna.
- Salinity is due to dissolved salts. It is 35‰ i.e. per 1000kg of water , there is 35 g of salt. Major portin of salt is NaCl followed by MgCl₂, MgSO₄ and K₂SO₄.

Oceans

- One ocean, broken down into 4 major oceans
 - Pacific, Atlantic, Indian and Arctic Oceans
- Surface currents
 - Driven by atmospheric circulation
 - Warm currents: western part of each basin
 - Cold currents: eastern part of each basin
- Underwater currents
 - Thermohaline circulation
 - Driven by density which is controlled by temperature and salinity
 - Act as convection currents

Ice

- The cryosphere

- Second only to the oceans as a place to store water

- Land ice

- Alpine glaciers, ice sheets, ice caps

- 10% of the land surface

- Oceanic ice

- Ice pack (floating ice), ice shelf continental ice sheet that projects over sea), ice snow

- (mass of ice that breaks off from larger ice bodies, floating independently), iceberg

- (chunk of ice broken from ice shelf)

- Largest ice pack in the arctic ocean

- Extent of permafrost

- Permanently cold subsoil: ground which remains below 0°C for more than 2 years

Surface waters

- Limited amounts-0.25% of the world's total water supply
- Highly variable in space
- Used for drinking water, agriculture (sustaining human life)

Lake

- Body of water surrounded by land
- Natural basin having a restricted outlet
- Sufficient inflow of water to keep basin filled

Marshes

- Body of water with water tolerant plants, primarily grasses and sedges

Swamps

- Body of water with water-tolerant plants, predominantly trees

Reservoirs

- Artificial lakes

Rivers and streams

- Natural watercourse flowing towards and ocean or another body of water

Undergroundwater

- Water stored underground
- 2.5 times that found in lakes and streams
- Found in many places, just need to dig
- No evaporation
- Can last a long time