

MSIP – 01

What is Physical geography?

Lead Author: Christine E. McMichael



The icefields of Patagonia, located at the southern end of South America, are the largest masses of ice in the temperate Southern Hemisphere (approximately 55,000 square kilometers). (Source: NASA)

Physical Geography comprises the study of natural patterns and processes at the Earth's surface, as well as the interactions between people and their environment, and is a sub-field of the discipline of Geography. Geography itself can be sub-divided into two main areas of inquiry - Physical Geography and Human Geography. While physical

geographers investigate natural patterns and processes (e.g., global warming, land-use and land-cover change, water resources, deforestation, and soil erosion), human geographers examine social and cultural patterns and processes (e.g., migration, religious diversity, transportation systems, urbanization, socio-economic conditions, and tourism). The essential question all geographers ask is *Why is what where?* Geographers use a wide range of tools to portray and analyze spatial information (information associated with a geographic location) including maps, geographic information systems (also known as GIS), remote sensing, global positioning systems (also known as GPS), spatial statistics, and mathematical modeling.

Four 'Spheres' of Physical Geography

The four spheres of Physical Geography include the Lithosphere, the Atmosphere, the Hydrosphere, and the Biosphere. The Lithosphere is the 'rock' sphere and comprises the solid and broken rock that has

been sculpted into landforms at/near the Earth's surface, as well as the thin layer of soil covering the surface. The Hydrosphere is the 'water' sphere and includes water in all of its forms (liquid, solid, and gas). The Atmosphere is the 'air' sphere, a gaseous envelope that encircles the Earth and serves as a reservoir for heat and moisture; it is a complex mixture of gases including nitrogen, oxygen, argon, carbon dioxide, water vapor, and ozone. The Biosphere is the 'life' sphere and includes all life forms and all areas at/near Earth's surface that are capable of sustaining life.

Sub-fields of Physical Geography

Physical Geography itself can be divided into five main sub-fields: climatology, geomorphology, pedology, biogeography, and hydrology. 'Weather' refers to the day-to-day variations in factors such as temperature, precipitation, wind, and humidity, while 'climate' refers to the long-term average values of these factors. Climatologists study the patterns of climate, the development of

different climates and the effects of climate on life. 'Morphology' is the study of form and structure, thus geomorphologists investigate the distribution of Earth's surface landforms and the processes that generate them. Pedologists study the distribution of soil types, their physical and chemical properties, and the processes of soil formation. A biogeographer examines the distribution of plant and animal life forms and the processes that produce those distributions. Finally, a hydrologist studies the occurrence and distribution of water in all its forms (e.g., rivers, lakes, oceans, glaciers, clouds, springs, and groundwater).

'Scale' in Physical Geography

Physical geographers may study natural patterns and processes at one or more spatial (space) or temporal (time) scales. Spatial scales range from global (entire Earth) to continental (e.g., North America, Europe, Asia) to regional (e.g., Rocky Mountains, Mediterranean Sea, Japan) to local (e.g., Denver, Colorado, Rome, Italy, Mt. Fuji, Japan) to individual

(e.g., a single animal, plant or hillslope). Temporal scales include long-term (e.g., centuries to millennia), medium-term (e.g., years to decades), and short-term (e.g., hours to days) events. For example, ice sheet formation and retreat occurs at continental scales over long periods, while tornadoes occur at regional scales over short periods. Other 'scale' examples include global warming (global, medium-term), drought (regional, medium-term), soil formation (local, long-term), flooding (local, short-term), landslide (individual, short-term), deforestation (individual, medium-term).

Questions: (answer on a separate sheet and keep it in your MSIP Binder right after the article)

1. Find five words you are not sure of and write definitions for them.
2. Explain the idea of the four spheres of physical geography.
3. What is the relationship between the four spheres?
4. What are the five branches of Physical Geography and what does each study?
5. Locate this article online and provide a proper bibliographic entry for it in MLA format.