

Physical Geography Notes: Introduction

Unlike most scientists in related disciplines, Geographers may focus their research on nearly any topic or subject related to the scientific analysis of human or natural processes on earth.

Geography

Geo—earth

Graphy—picture or writing

Geography has many subdivisions (Fig.1.2)

Verifying factors-understanding/explain

1. Spatial locations
2. Distributions
3. Relationships

Main Subdivisions

1. Human Geography – study of human attributes and the result of these attributes.

>populations, cultural ... industrialization, urbanization

☺ Regional Geography-Middle East, Asia

2. Physical Geography-encompasses the study of the process and features that make up the earth:

Meteorology

Biography

Climatology

Soil Geography

Geomorphology

Hydrology

Oceanography

Glaciology

Tech, Tools, and Methods

1) Computer Technology: GIS, GPS

2) Cartography: Map making

Physical Geography Has Three Major Roles Among the Sciences Today:

1) Geography as a Spatial Science

2) Geography as a Physical Science

3) Geography as an Environmental Science

Geography as a Spatial Science

Spatial science – includes recognizing, analyzing, and explaining the various similarities and differences in phenomena located on the earth's surface.

>Regions are meaningful divisions

As a spatial Science, it's all about location. There are two ways of expressing location:

1) Absolute Location: Using a coordinate system

2) Relative Location: identifies where something is in relation to something else

Spatial Questions:

1) Where are sand dunes found?

2) Why are they found there?

Physical Geographers are also concerned with characteristics of places. What do they share with other places that are similar?

3) What do the Sahara Desert and the Mojave Desert have in common? How are they different?

When studying how things are arranged in space, geographers are usually interested in two spatial factors (Figure 1.5).

a) Spatial Distributions: the extent of the area or areas where a feature exists.

4) Where are the world's deserts found?

b) Spatial Pattern: refers to the arrangement of features in space (random, clustered, widely spaced)

5) Do the climates of the world occur in patterns?

Finally, few processes on Earth operate in isolation. An occurrence or process affecting one place generally can also have an impact somewhere else. The Earth is a dynamic place.

Geography as a Physical Science

The EARTH System

System-a set of parts or components that are interrelated.

*components are variables (they can change)

Therefore, changes in one part of the Earth System affect the other parts of the system.
(Location and position of mountains affect rainfall, which affects vegetation)

The Earth System is Dynamic (ever-changing).

Short Term: Seasons, tides, quakes, floods, volcanoes

Long Term: Climate changes (spread of deserts)

*Changes can be natural or human induced

(It is important to understand the system)

The Earth System can be subdivided into four parts:

- 1) Atmosphere-gaseous blanket of air that envelopes, shields and insulates the Earth (the weather and climate)
- 2) Lithosphere-the solid Earth, including landforms, rock, soil and minerals
- 3) Hydrosphere-water, from oceans, lakes, rivers and glaciers
- 4) Biosphere-all living things

There four systems create and nurture the conditions necessary for life on Earth.
Buckminster Fuller: Our planet is a life support system, transporting us through space.

Example: How does the hydrosphere affect the other major divisions of the Earth System?

A human thing: Pollution: an undesirable or unhealthy concentration of a contaminant in an environment as a result of human activities.

*Pollution can travel far (DDT and Lead in Antarctic snow)

Natural Resources: Renewable vs. Nonrenewable

MODELS AND SYSTEMS

Model: Representation of the real world.

- *Simplifies our complex reality
- *Permits prediction
- *Designed with a purpose

Types of Models:

- 1) Physical Models: 3d models, like globes
- 2) Pictorial/Graphic Models: 2d, photos, maps, images, graphs, diagrams and drawings
- 3) Mathematical or Statistical: used to predict possibilities (future floods, quakes)
- 4) Conceptual Models-imagery (mind) that we use for understanding our surroundings and experiences.
Paint a mental map-travel route, spatial info (distribution of features in space)

Systems Theory

Identify System>>>Break It Into Parts>>>Understand how parts are related
(Matter or Energy)

Lumper vs. Splitter>Systems can be subdivided into subsystems and so on.

Subsystems: water cycle, climate systems, weather systems, ecosystems, storm systems, stream systems

Figure 1.7 (Page 8)

Inputs: Energy or matter entering or leaving system.

Feedback: Interactions between Energy and Matter

Open System: Energy and matter are not confined but are constantly entering and leaving.

Closed System: No substantial amount of matter crosses the boundaries, although Energy can go in and out.

Planet Earth is a closed system.
Most Earth systems are open systems.

Using models, we can describe the Earth as a system.

EQUILIBRIUM IN EARTH SYSTEMS

Equilibrium is reached when the parts or variables are balanced (input=output).
This is the balance of nature.

Most natural systems have a tendency toward equilibrium.

Thus, most systems are continually shifting slightly one way or another as a reaction to external conditions.

This change within a range of tolerance is called dynamic equilibrium.

Interactions are called feedback. This feedback causes change within the system.

- 1) Positive: change reinforces the direction of the initial change.
- 2) Negative: a change offsets another change.

Threshold: a condition that causes a system to change dramatically.

- *stress>strain
- *fertilizer

Figure 1.10 The Feedback Loop

Geography as an Environmental Science

Humans and the Environment

Environment-our surroundings physical, social, and cultural aspects.

Ecology-study of relationships between organisms whether animal or plant and their environment.

Ecosystem (ecological system)-community of organisms and the relationships of these organisms to their environment.

☺ Any scale-backyard to the Mojave

Human-Environment Equation

World Map of Population Density

“Humans are not passengers on the spaceship Earth, they are the crew.”