

Environmental Science Is a Study of Connections in Nature

Environmental science: interdisciplinary science connecting information and ideas from

- Natural sciences: ecology, biology, geology, chemistry...
Social sciences: geography, politics, economics, Humanities: ethics, philosophy

Sustainability: the capacity of the earth's natural systems and human cultural systems to survive, flourish, and adapt into the very long-term future



Natural Resources + Natural Services = Natural Capital

Natural resources:

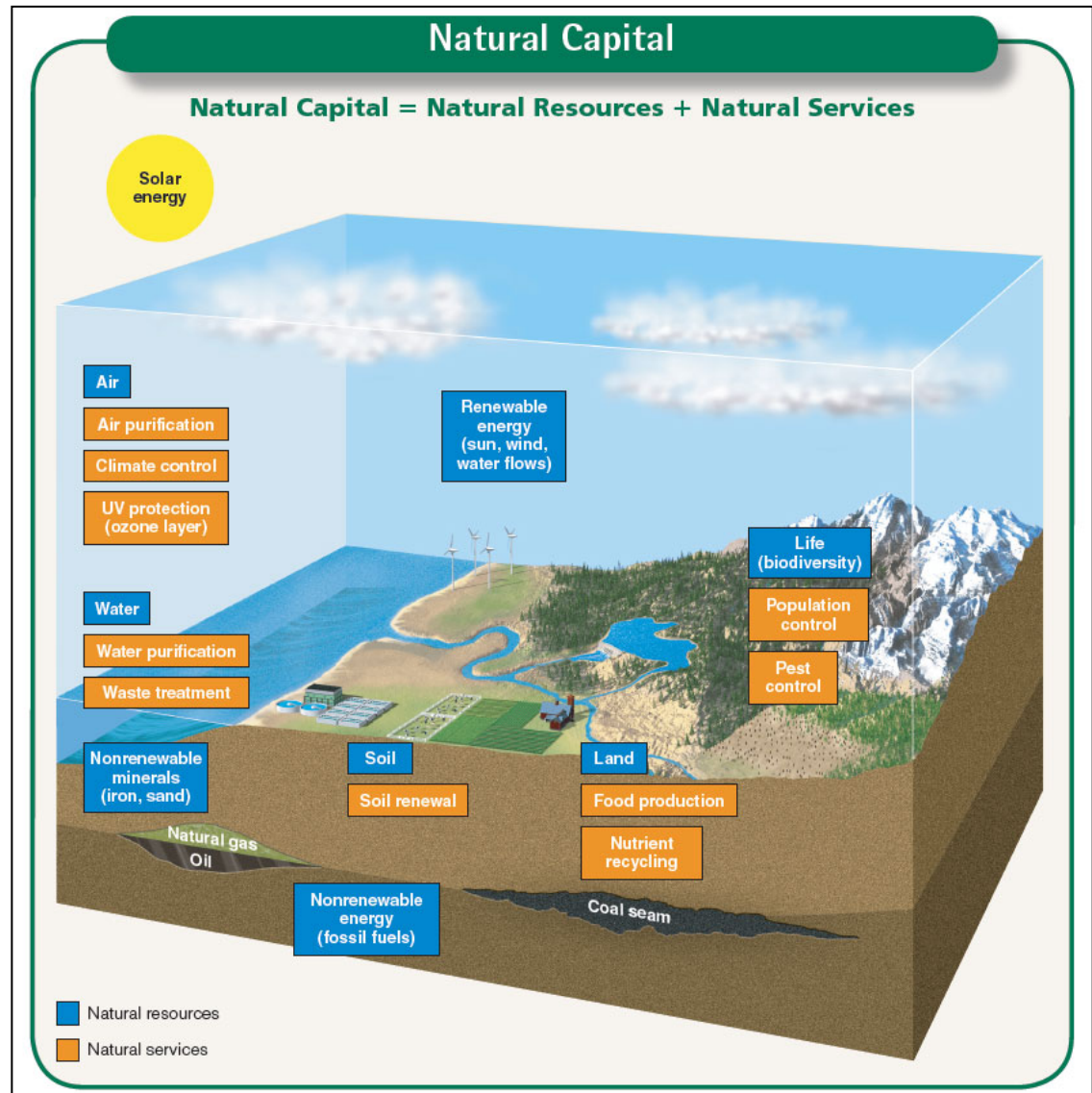
useful materials and energy in nature

Natural services:

natural processes such as renewal of air, water, & soil

Natural capital:

the natural resources and natural services that sustain human population and our economy.



Which of the following is an example of a natural (ecosystem) service?

- a) A parasite attains nutrients from its host.
- ☒ b) Wetlands provide flood control for cities.
- c) Copper is extracted from mines.
- d) The movement of tectonic plates causes volcanic activity and earthquakes.
- e) Tsunamis clear coastland debris.

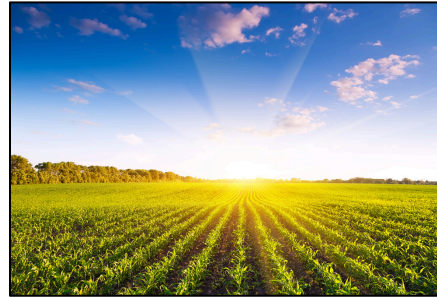
Some Resources Are Renewable and Some Are Not

Resource

- Anything we obtain from the environment to meet our needs

Perpetual resource

- Solar energy



Renewable resource

- Several days to several hundred years to renew
- E.g., forests, grasslands, fresh air, fertile soil

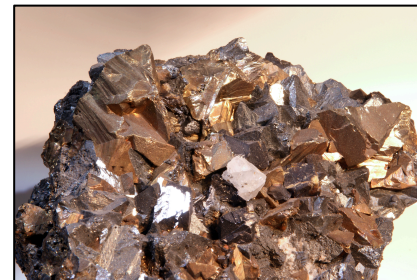
Sustainable yield

- Highest rate at which we can use a renewable resource without reducing available supply



Nonrenewable resources

- Energy resources
 - Metallic mineral resources
 - Nonmetallic mineral resources



Specific examples of renewable resources are:

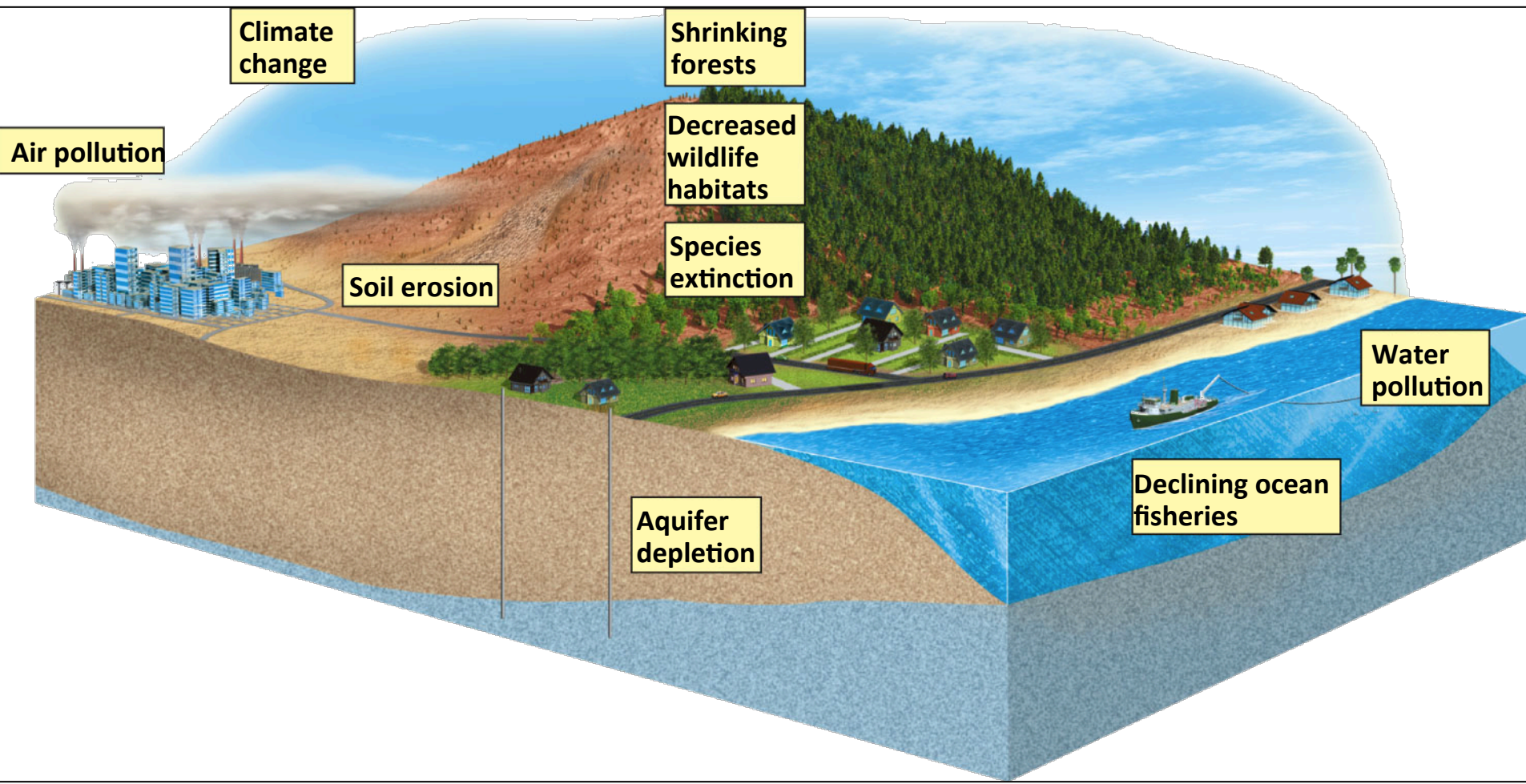
- a. water, soil, air, and oil.
- b. timber, water, and mineral resources.
- c. agricultural crops, soils, and natural gas.
- d. Forests, water, and soil.

We are Living Unsustainably

Environmental degradation: wasting, depleting, and degrading the earth's natural capital (a.k.a. **natural capital degradation**)

Natural Capital Degradation

Degradation of Normally Renewable Natural Resources



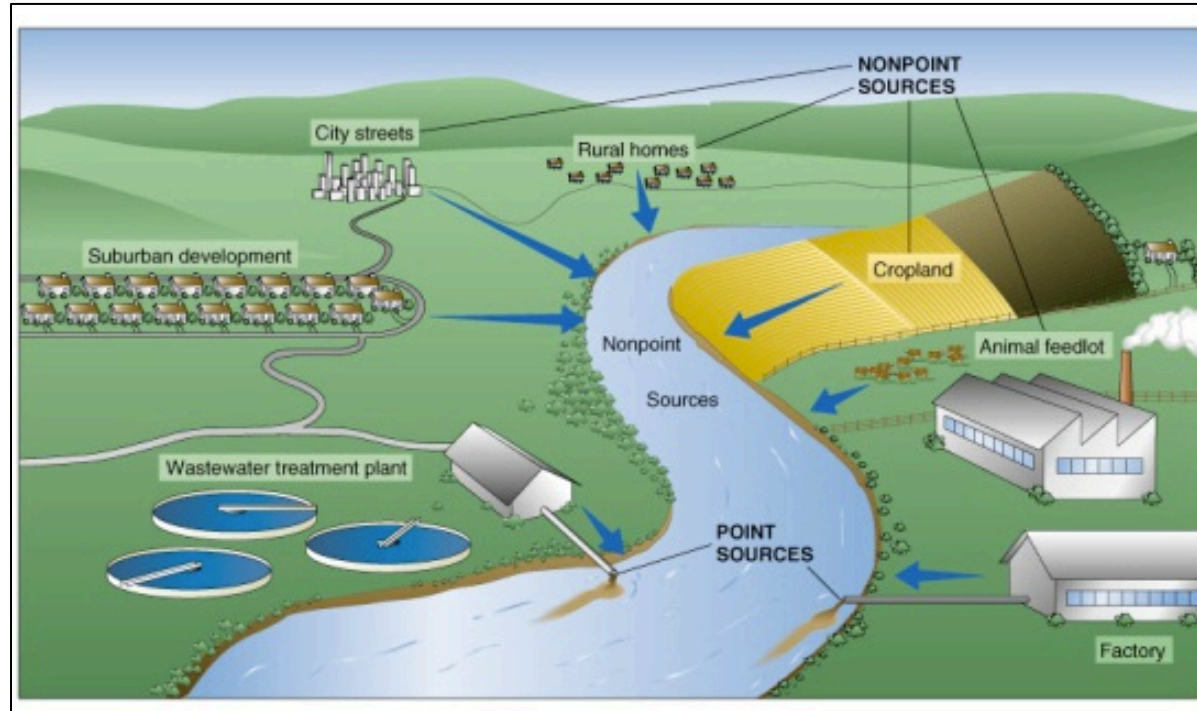
Pollution Comes from a Number of Sources

Sources of pollution

- Point sources
E.g., smokestack
- Nonpoint sources
E.g., pesticides blown into the air

Main type of pollutants

- Biodegradable
- Nondegradable



2 Types of Pollution Control

- Pollution cleanup (output pollution control)
- Pollution prevention (input pollution control)

Nonpoint sources of pollution include all of the following EXCEPT:

- a. overspill from a stockyard (a large yard containing pens and sheds, typically adjacent to a slaughterhouse, in which livestock is kept and sorted).
- b. runoff from croplands.
- c. a smokestack from a power plant.
- d. urban runoff from streets.