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An Introduction to Environmental Science

YOUR WORLD
YOUR TURN



Environmental Science

Chapter 1

An Introduction

Section 1 Goals:

- Discuss the importance of environmental science.
- Analyze the importance of environmental science from a social and economic context.
- Investigate how humans impact on the environment has changed over the course of history.

All notes can be found at <http://www.manskopf.com>

Goals

- Define environmental science
- List the five major fields that contribute to environmental science
- Discuss how human's impact on the environment has changed over history
- Classify environmental problems

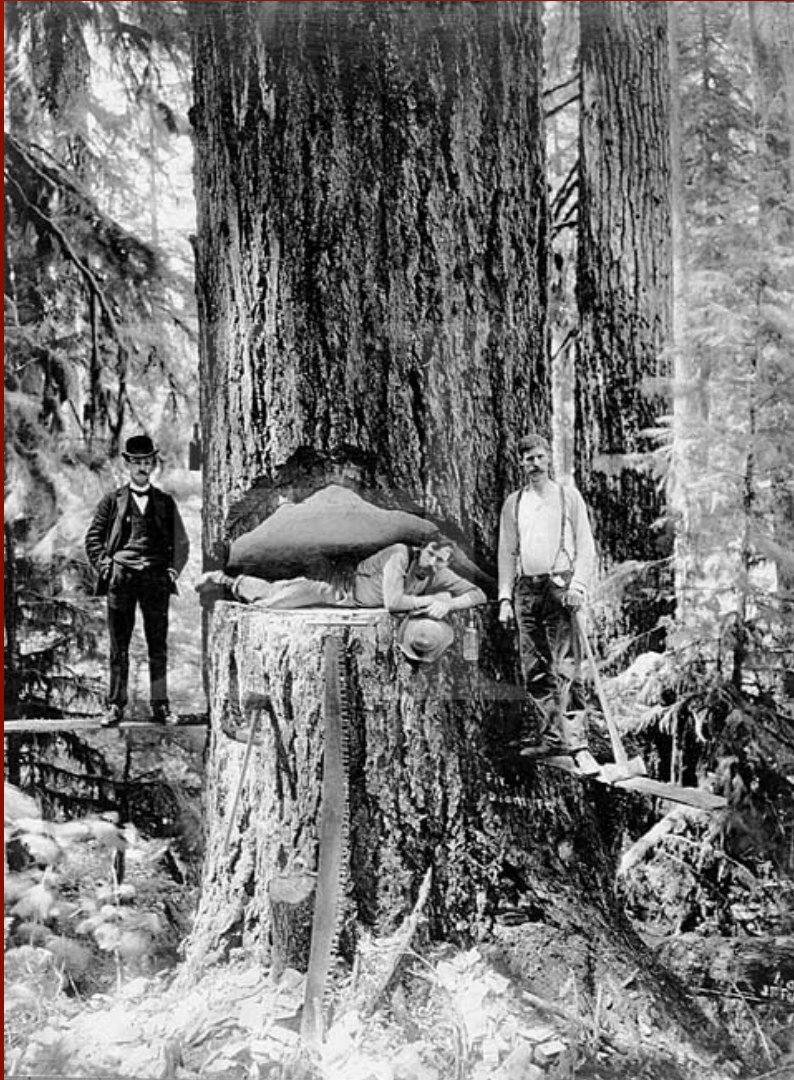
Environmental Science



- Devoted to studying the impacts humans have on the environment

NYC Today and 400 yrs ago

Goal of environment science



To understand and solve environmental problems

- Ecosystem functions
- Air Pollution
- Water Pollution
- Toxic Chemicals
- Climate Change
- Resource usage

Newer field of study

Environmentalism

- Is a social movement
dedicated to
protecting the
natural world.

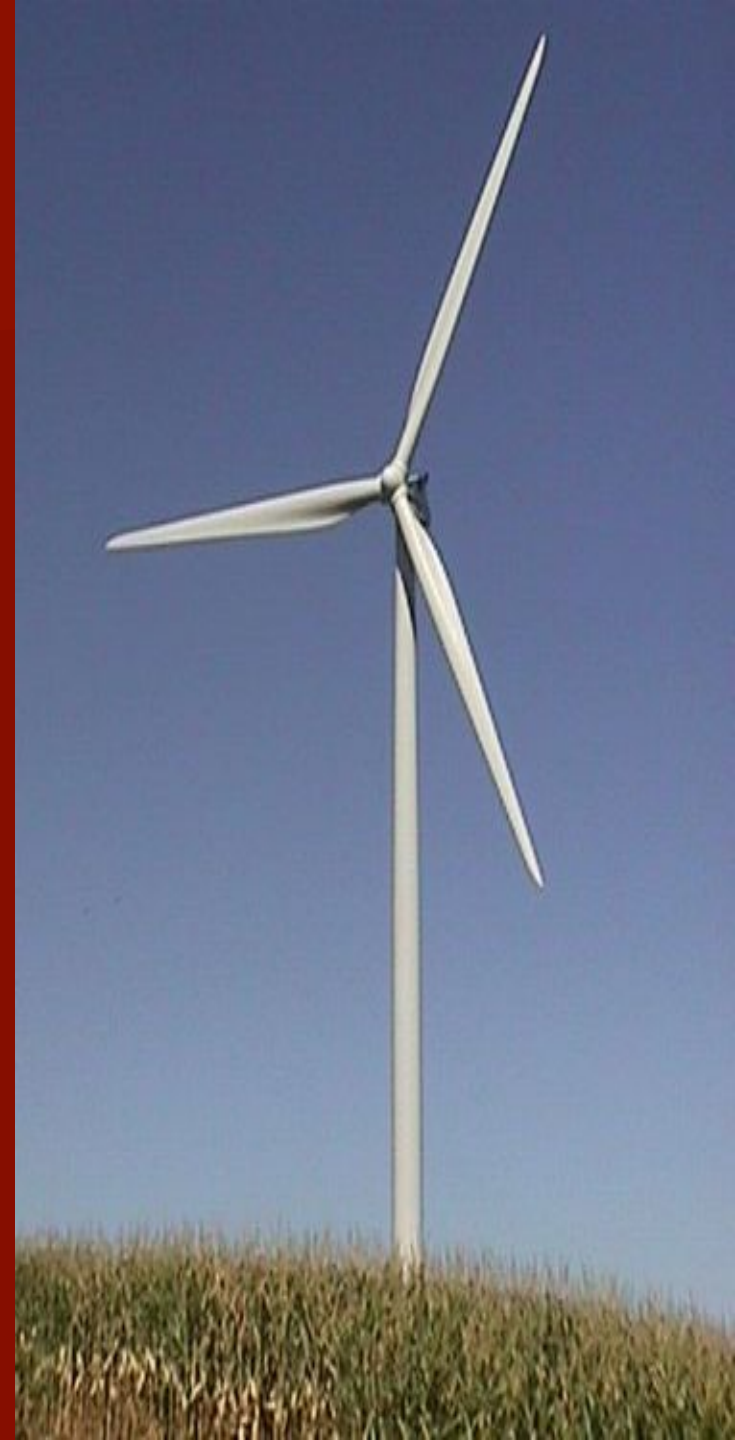




What are the environmental consequences of choosing these types of energy sources?

What are the benefits and costs of these energy sources?

Why does 50% of our current electricity come from coal?



Foundation of Environmental Science

Ecology: the study of how living organisms interact with each other and the nonliving environment.

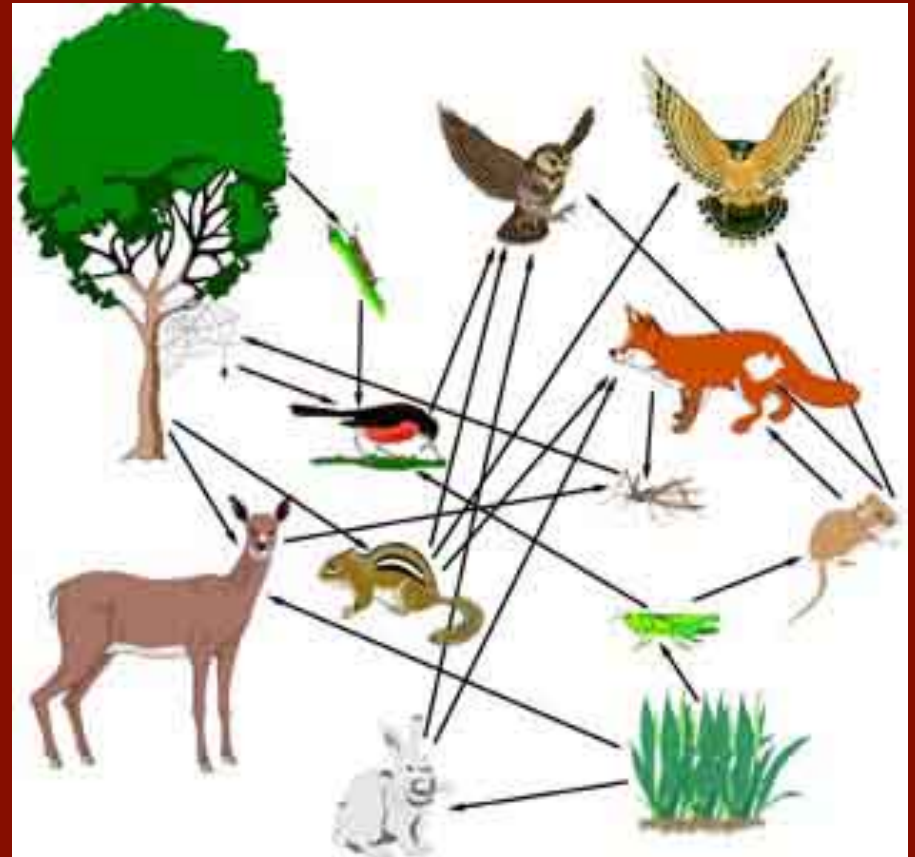
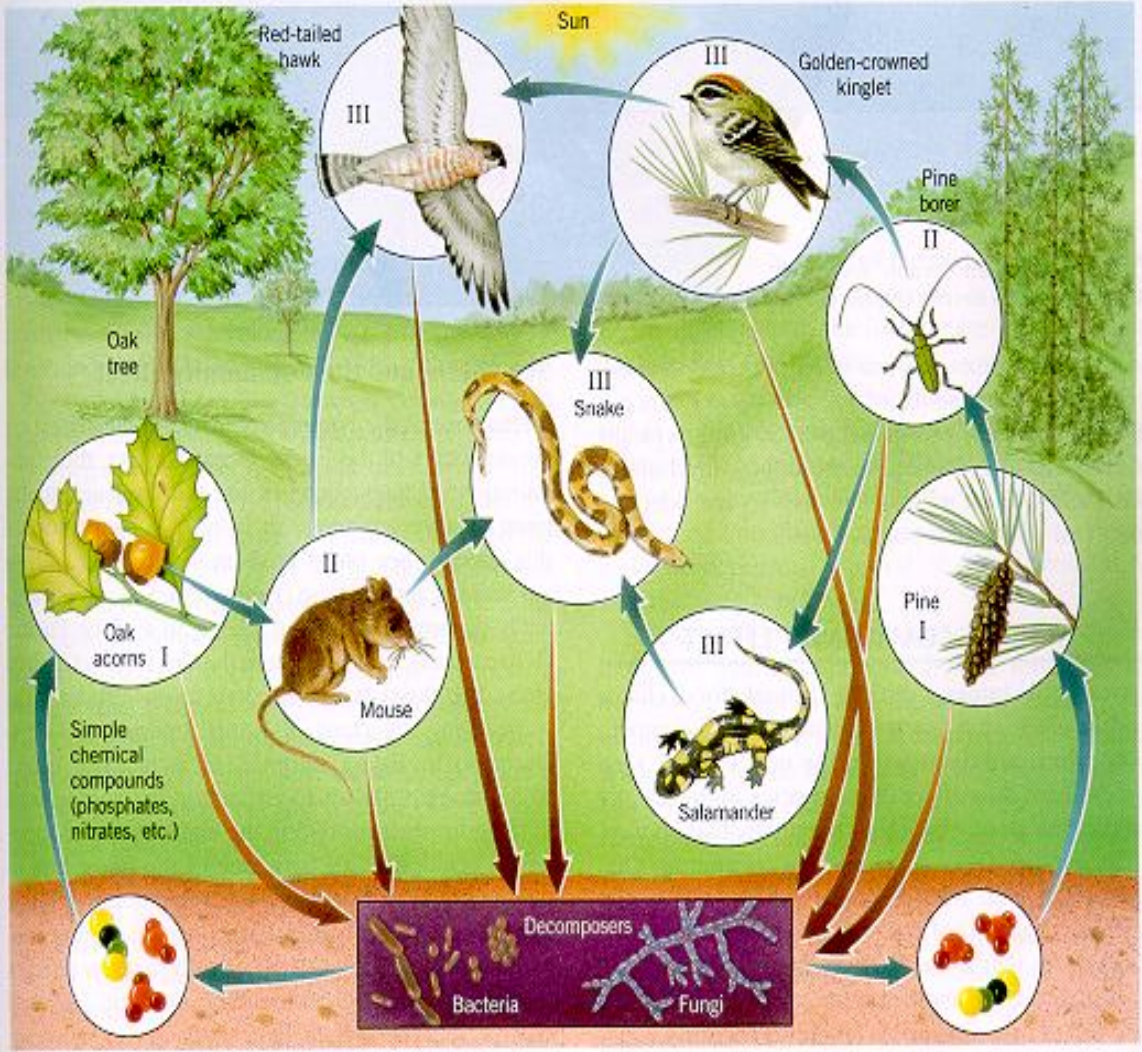


FIGURE 6.3 Food webs: (a) a typical terrestrial food web. Roman numerals identify trophic levels.



Ecology wants to study how all of these living and nonliving things interact

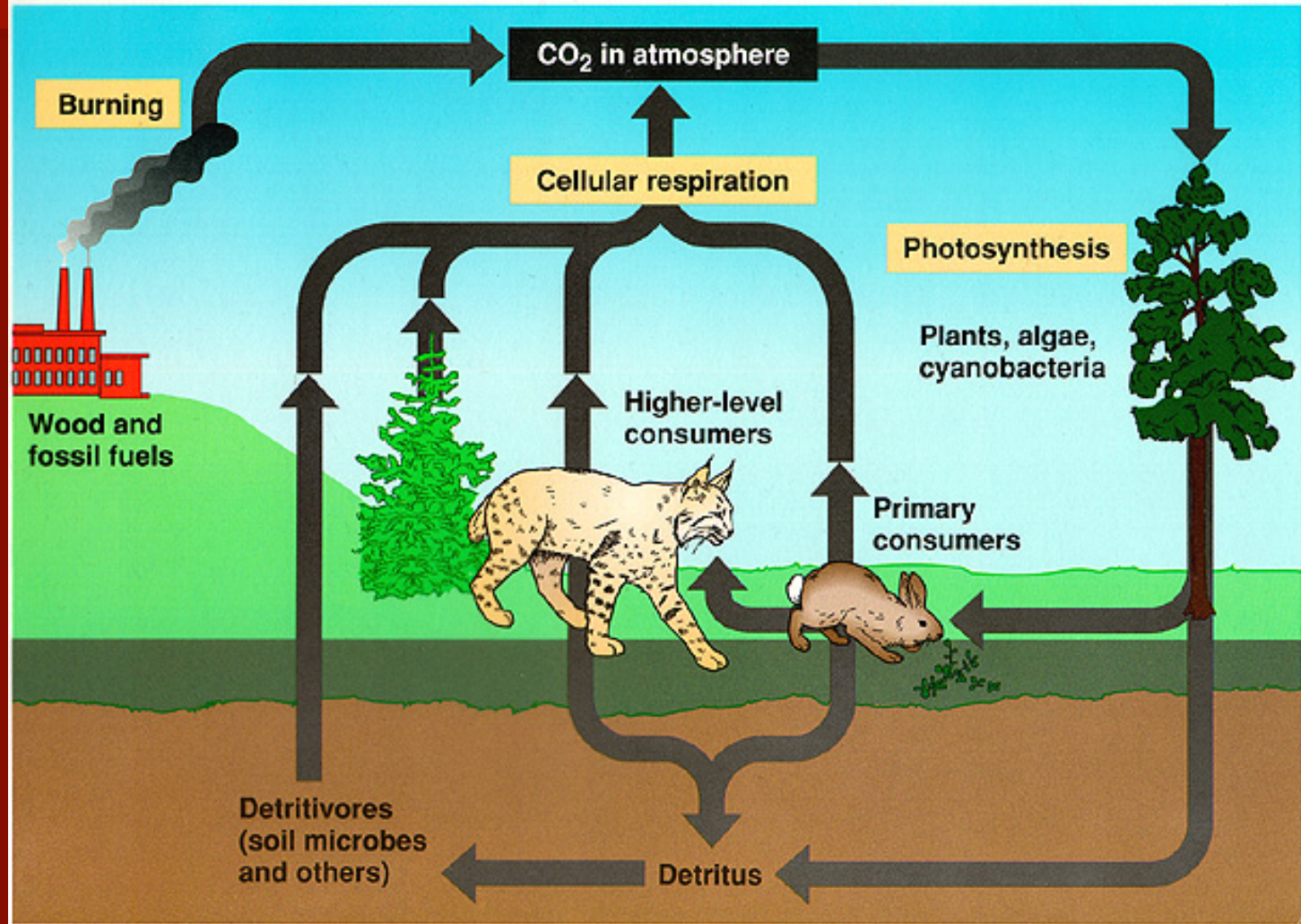


Fields of Study that Contribute to Environmental Science

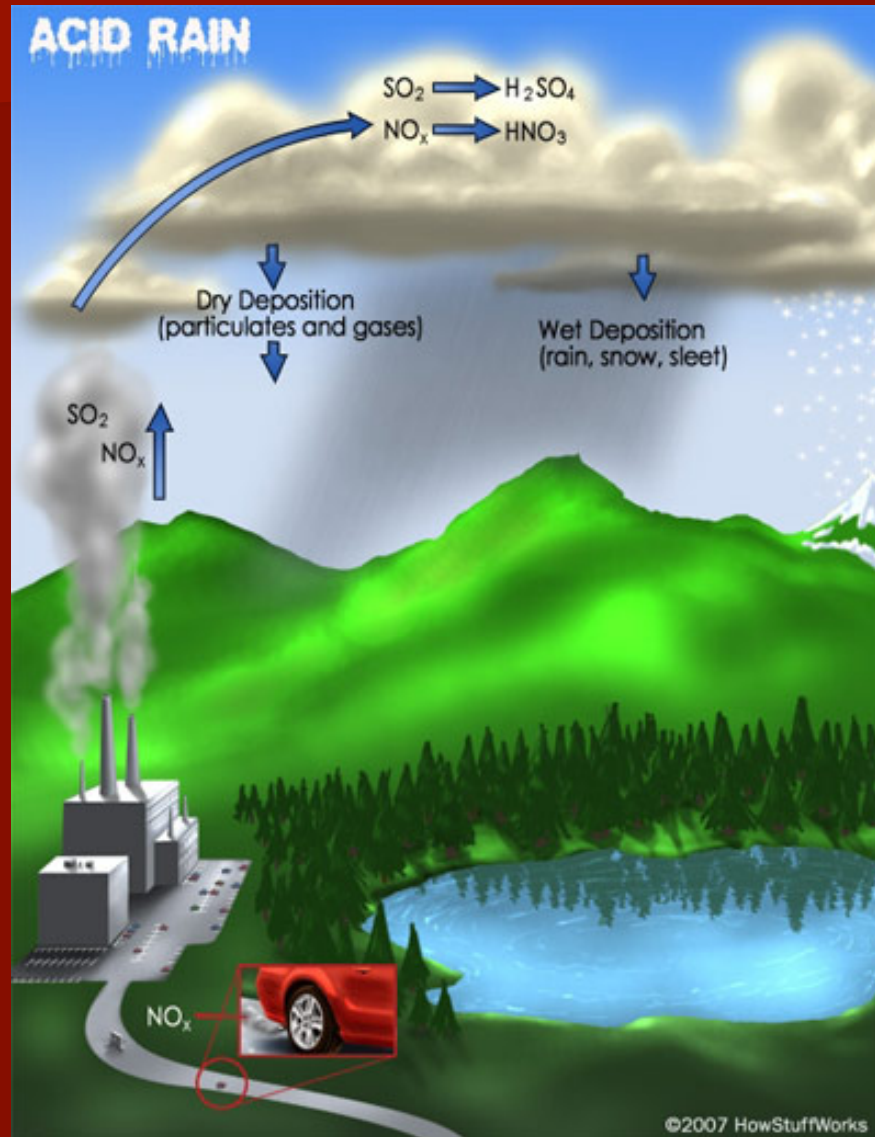
- Biology: the study of living organisms
- Chemistry: the study chemicals and their interactions
- Physics: the study of matter and energy
- Earth Science: the study of earth's nonliving systems
- Social Sciences: the study of human populations

Biology

The carbon cycle



Chemistry



Physics



Earth Science



Social Sciences



Human's Impact Over History

Wherever humans have hunted, grown food, or settled we have changed the environment.

- How have those changes impacted the environment over human history?



Hunter-Gatherers



- Most of human history
- People who obtain food by moving around collecting plants and hunting wild animals.
- What are ways you think they had an impact on the environment?
- Why didn't they have a large impact on the environment?
- What kind of life did they lead?

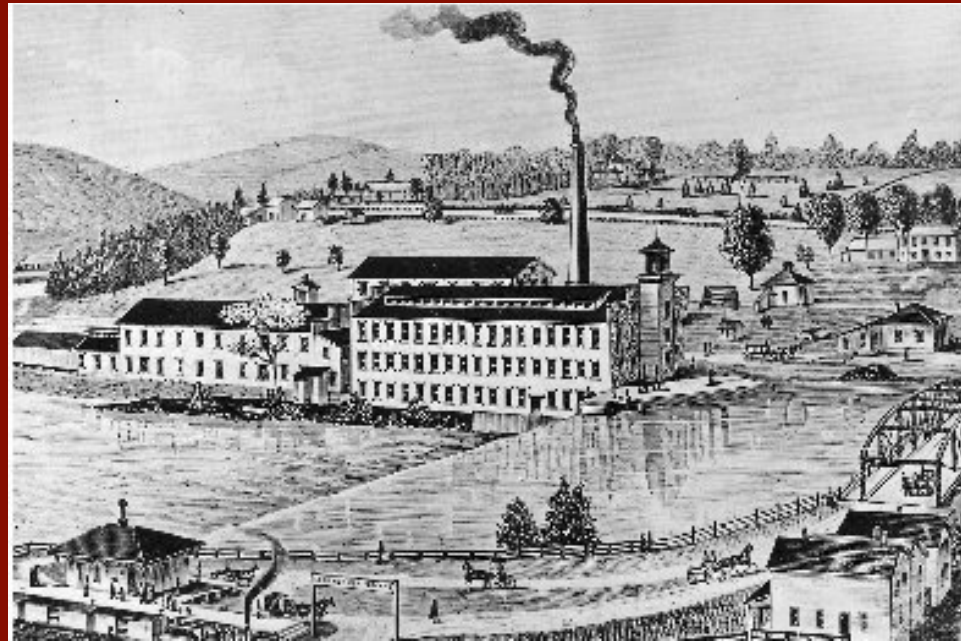
Agricultural Revolution



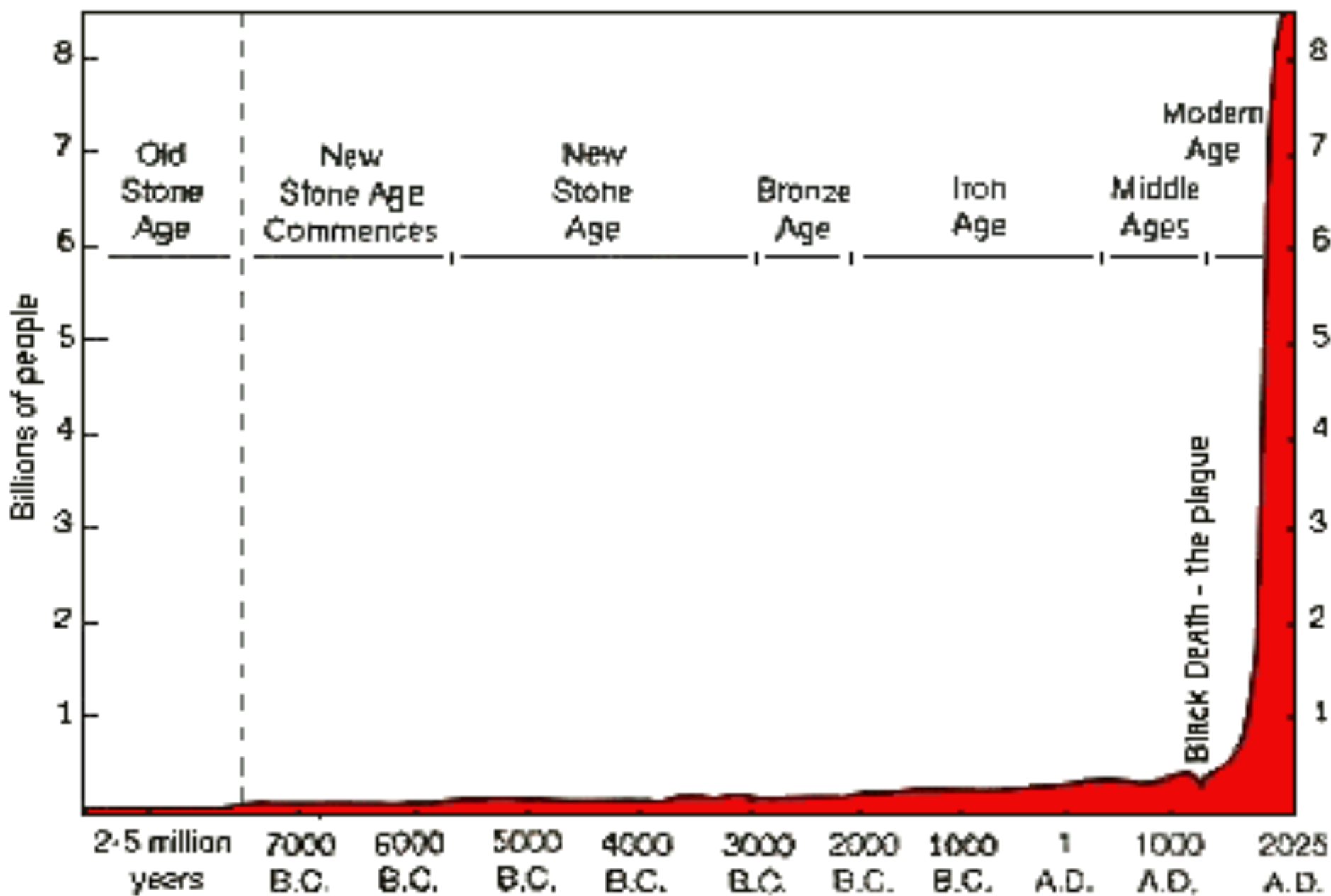
- Plants and animals were domesticated and population grew.
- 10,000 years ago
- Life got easier
- Population grew
- Towns began forming
- Impact on environment grew
- More land used

Industrial Revolution

- Caused a shift to fossil fuels as an energy source.
- 1800s
- Life got easier
- Advances in technology
- People lived longer
- People moved to cities away from farms
- Increased environmental impact WHY???



World Population Growth Through History



Spaceship Earth



- Earth is essentially a “closed system”
- Island Earth
- Energy from sun comes in and leaves as heat
- What we have IS IT... no more... One Earth, One Chance
- Became evident during missions to moon 1969

What are our main environmental problems?



Tragedy of Commons

- Conflicts arise when people share resources
- If no one takes responsibility for the resource it will get overused and become degraded.
- Examples?



What are Our Main Environmental Problems: Resource Depletion

- Resource depletion: using up resources before they can be replenished
- Example: Renewable resources like trees cut faster than they formed
- What are some other example of renewable resources?
- Can theoretically last forever



What are Our Main Environmental Problems: Resource Depletion

- Nonrenewable resource forms more slowly than it is used up
- Examples: minerals like aluminum and fossil fuels like coal, oil and natural gas.
- Resource is said to be *depleted* when almost used up



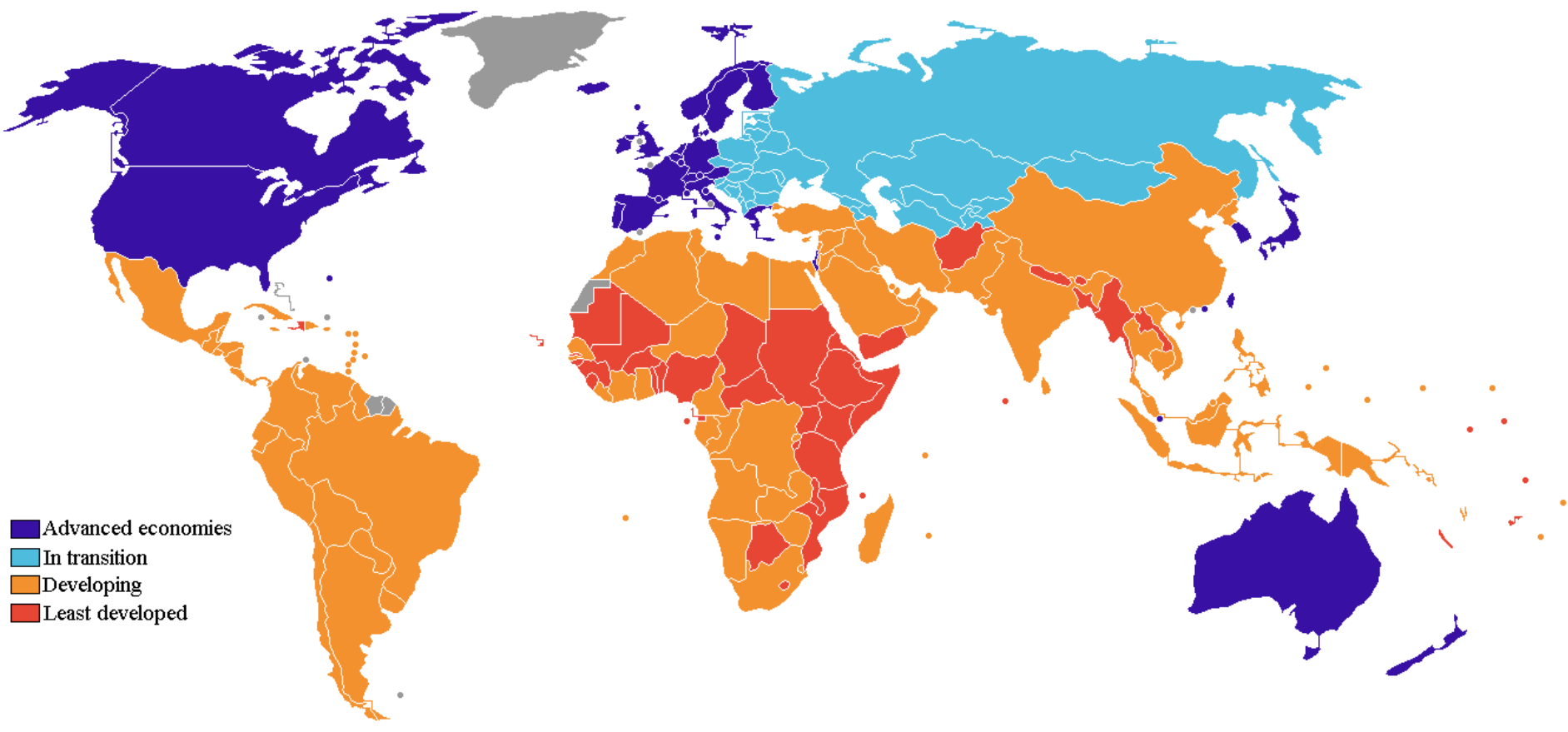
Renewable and Nonrenewable Resources

Renewable	Nonrenewable
energy from the sun	metals such as iron, aluminum, and copper
water	nonmetallic materials such as salt, sand, and clay
wood	fossil fuels
soil	
air	

Who uses most resources?

- Developed Countries like the U.S. (high personal wealth) have high consumption rates
- What are the “developed” countries of the world?
- Developing Countries: have high population growth, poverty and lower resource consumption
- List several

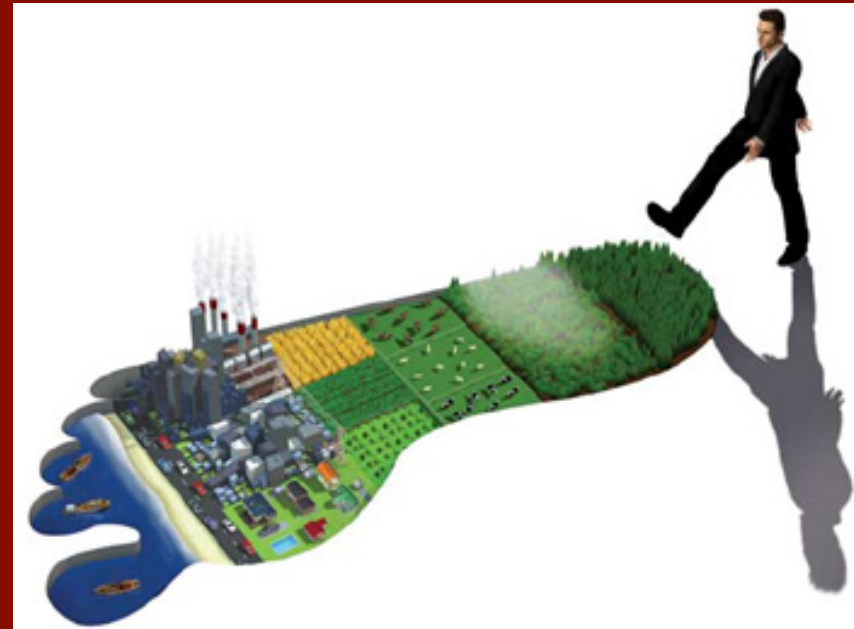




- Advanced economies
- In transition
- Developing
- Least developed

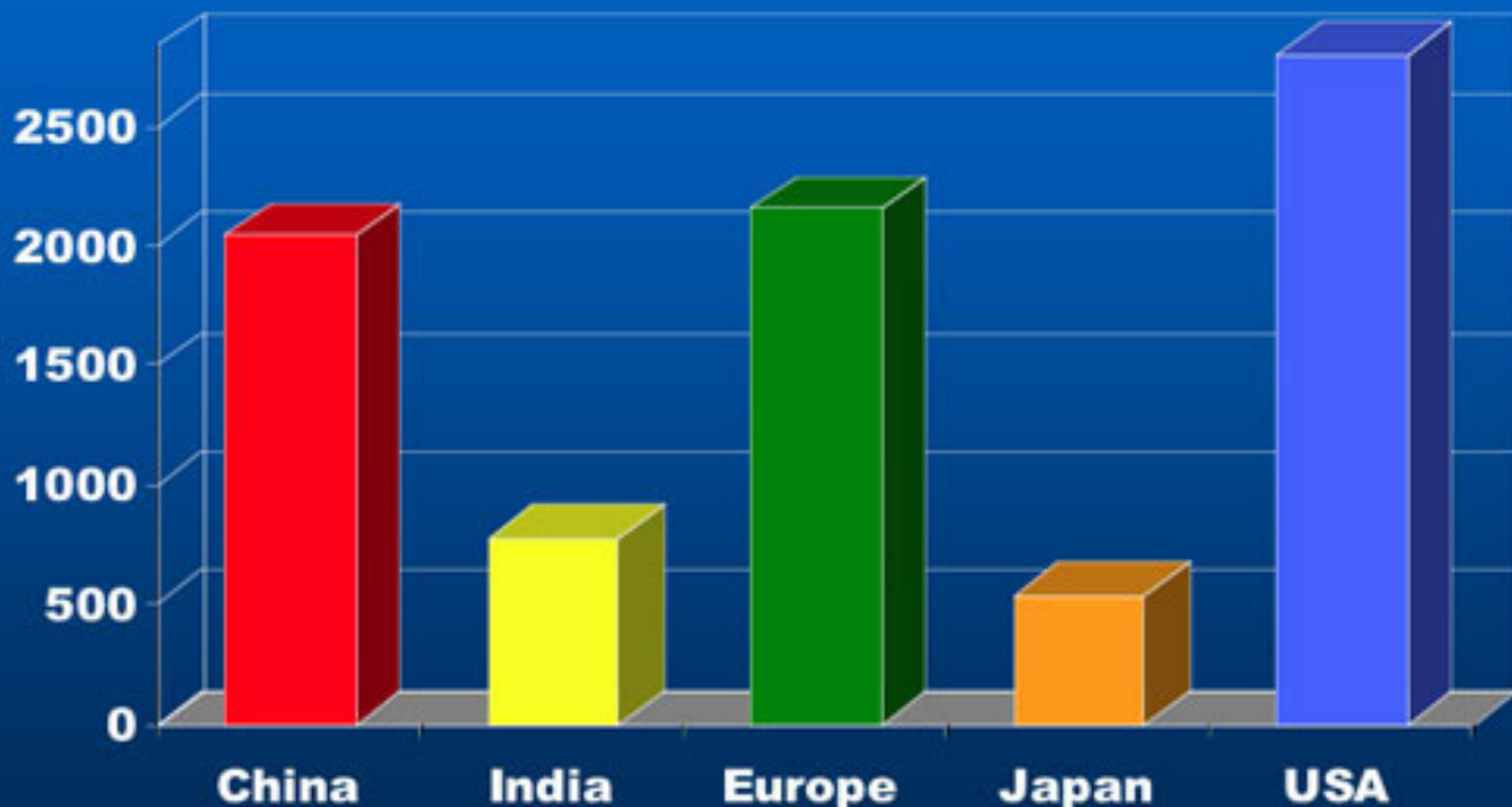
Ecological Footprint

- The productive area of land needed to support a persons life
- Food, cloths, coal, oil, plastics, forest, etc. all needed to support your lifestyle
- Compare countries
- <http://www.myfootprint.org/>

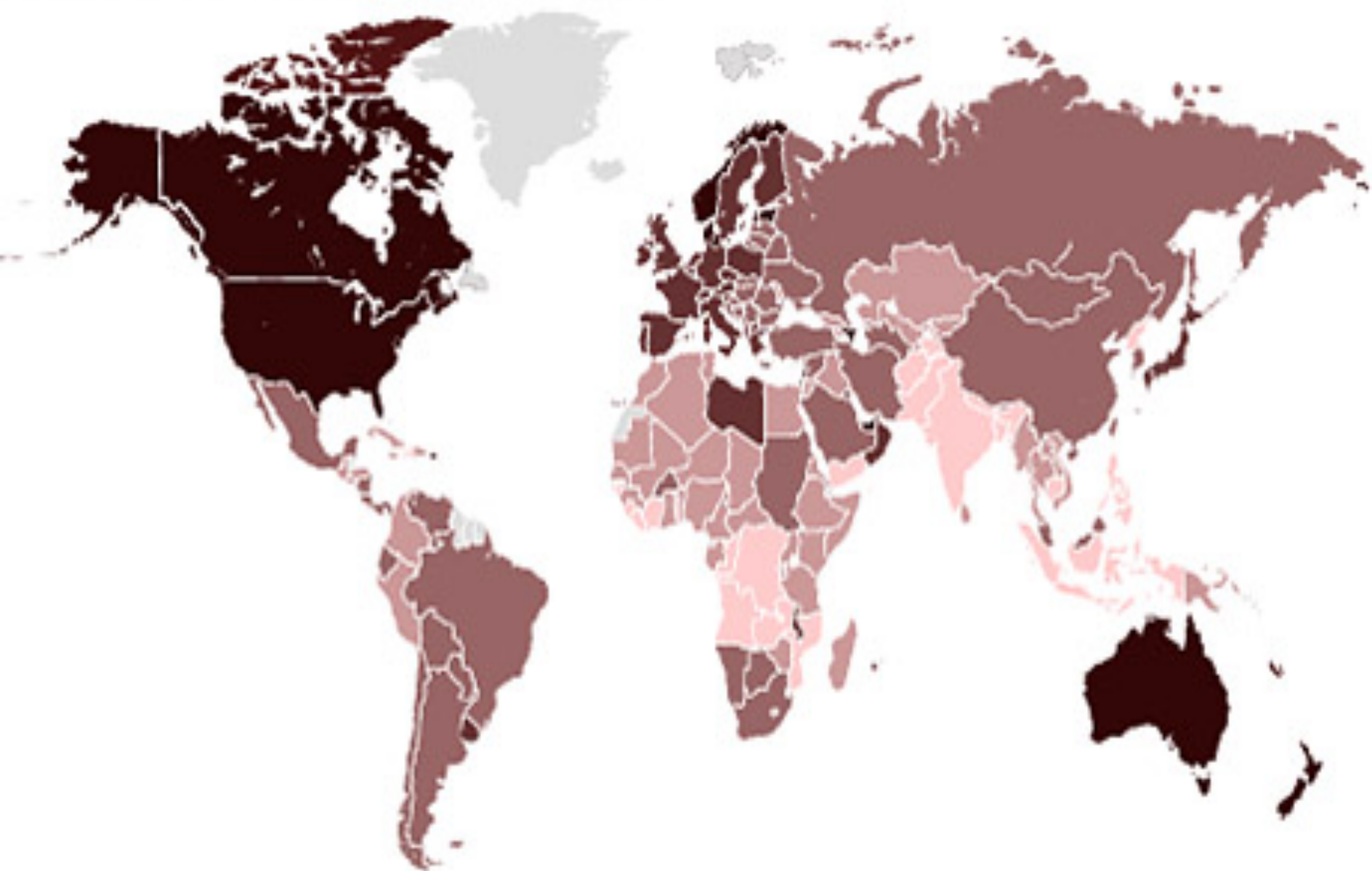


Ecological Footprint 2004

(million global hectares)



ECOLOGICAL FOOTPRINT BY COUNTRY



SOURCE: WWF

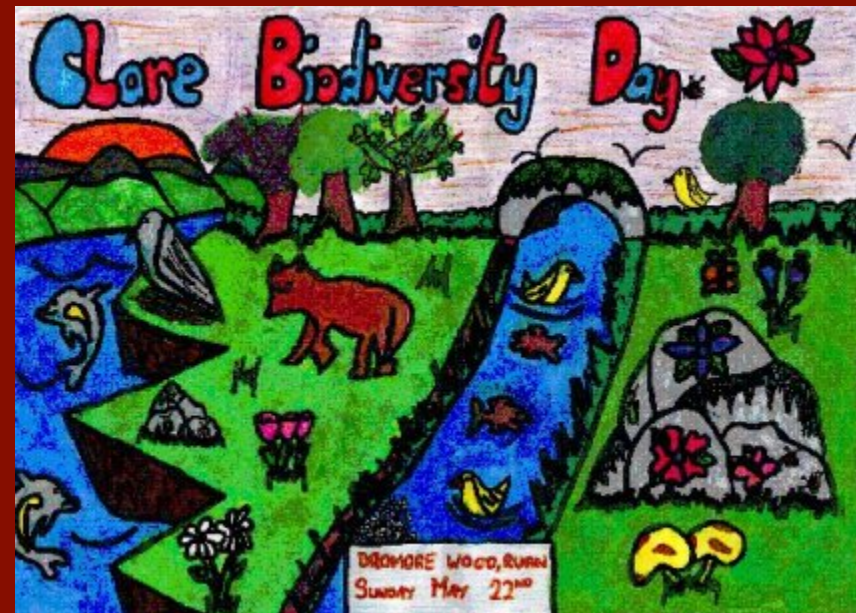
What are our main environmental problems: Pollution



- Pollution: an undesirable change in the air, water or soil that affects humans or other organisms.
- **Biodegradable**
- Air pollution
- Water pollution
- Land pollution
- Can you give examples?

What are our main environmental problems: Loss of Biodiversity

- Biodiversity: the number and variety of species that live in an area.
- Earth has been home to 100s of millions of species
- Only a few exist today
- Mass Extinctions



Sustainability

- Condition in which human needs are met without harming future generations.
- Are we living sustainable today?
- What would need to change?





End of Section 1

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Video:
<http://player.discoveryeducation.com/index.cfm?guidAssetId=384F8786-1450-4770-8786-042807820414>

Remember, notes also at
kdecie.weebly.com