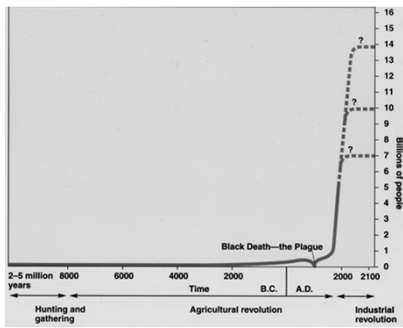


The Foundations of Environmental Science

Sustainability
Stewardship
Sound Science

Chapter One Miller 2011

HUMAN POPULATION GROWTH



J-shaped exponential growth

July 2011 world population 7 billion

WHAT IS ENVIRONMENTAL SCIENCE?

An interdisciplinary study that integrates information from the natural sciences that study the natural world and the social sciences that study how humans and their institutions interact with the natural world

● *The science became mainstreamed with the first earth day in April 1970.*

The four main stages of population transition

1. Hunters & Gathers-

2. Agricultural revolution-

3. INDUSTRIAL/ MEDICAL REVOLUTION

- Began in mid 1700's, 1800's for USA
- **Controlling energy allowed regions to populate past carrying capacity**
- Increased medical knowledge extended life span

SIX LARGEST ECONOMIES BY GDP

1. UNITED STATES

UNITED STATES
EUROPEAN UNION

In the last 50 years
the United States has
used more resources
than the rest of humanity
in its history!!!!!!

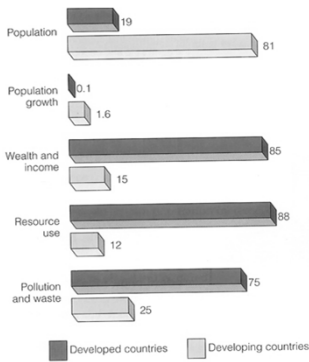
Planetary Stress

Barrels of Oil per person per year		Kg of grain per person in 2005	
● China	1.0	☒ China	292
● India	0.9	☒ India	173
● U.S.	25.3	☒ Europe	561
		☒ Japan	354
		☒ U.S.	918

What would happen to the world's resources if everyone consumed like American's?

When resources become economically depleted we have to make a change.
Do we . . .

Developed vs. Developing Country in 2006



About 97% of the world's population increase between 2006 and 2050 is expected to occur in developing countries

Environmental Impact

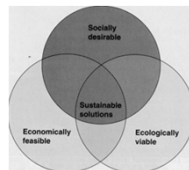
The average U.S. citizen consumes about 30 times as much as the average citizen in India and 100 times as much as the average person in the world's poorest country

What is Stewardship?

- It is the ethical and moral framework that influences our public and private actions.
- A steward of the environment is one who considers the implications of actions upon the biosphere.**
- Those effects can be immediate or they can accumulate.
- They can be short lived or have long term implications**



What about Sustainability?



- Is the resource renewable or non-renewable?
- Can the action be sustainable without negative implications to the surrounding environment?**
- If the implications are negative, can they be remedied in a short period of time?

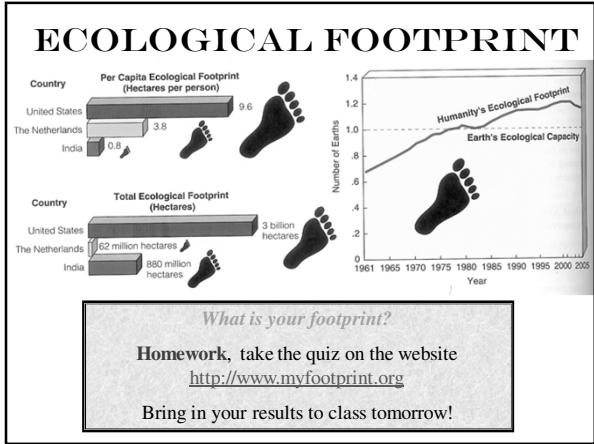


Four Principles of Sustainability

Could living within the principles of sustainability create an environmental revolution



Scientists estimate that ecosystems services given by the natural environment total \$30 trillion a year



Ecological Footprint per person in hectares 2006

- China 1.6
- India 0.8
- Europe 4.7
- Japan 4.8
- U.S. 9.7
