

Visualizing Environmental Science

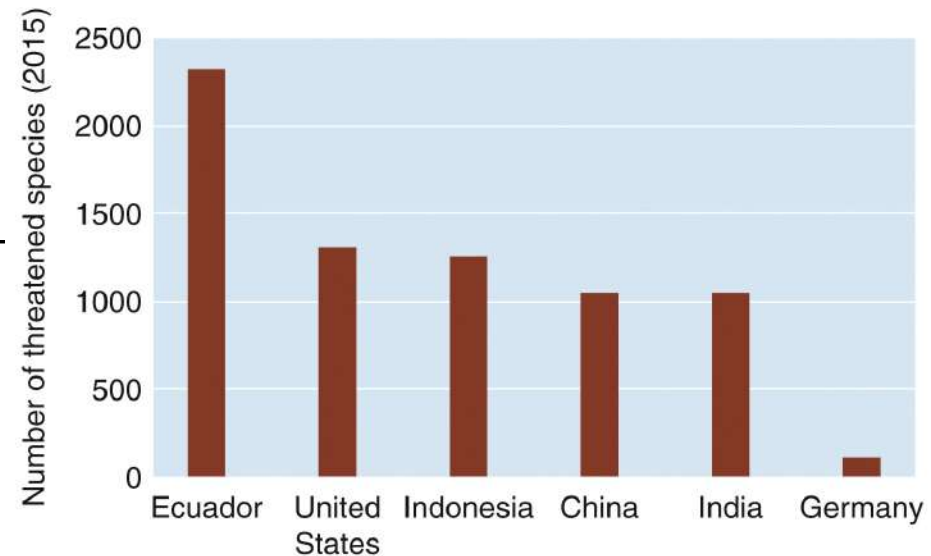
The Environmental Challenges We Face

Chapter 1



A Rapidly Changing World

- _____ are the dominant agent of environmental change
 - Humans transform the _____
 - Increasing _____ are overwhelming Earth's regenerative capacity
- Human activities have:
 - Disrupted _____ of thousands of species
 - In 2015, a total of 22,784 species were classified as _____ worldwide
 - Profound effects on processes such as nutrient cycles and _____



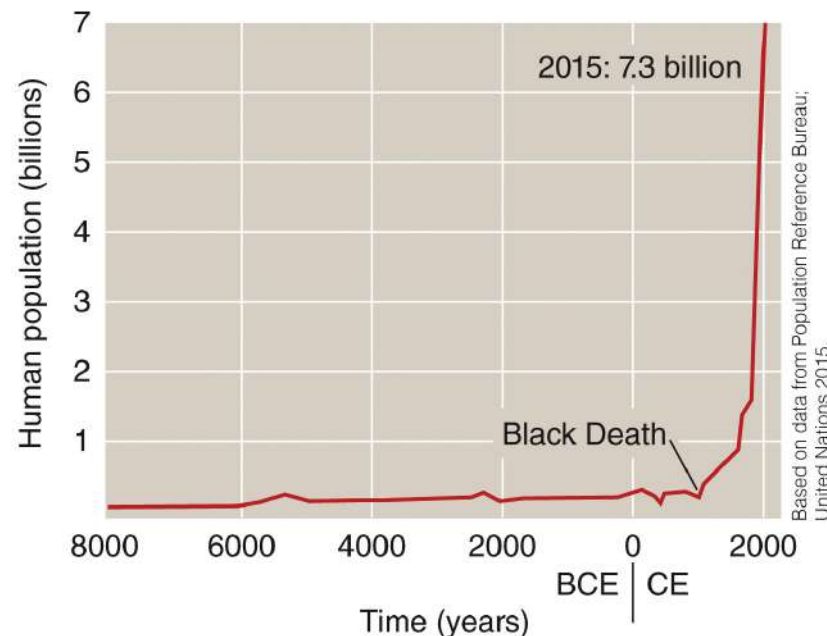
Based on data from International Union for Conservation of Nature 2015. Red List of Endangered Species.

Human Impacts on the Environment

- World population may stabilize by the end of the _____ century
 - Population experts project anywhere from 7.7 to 10.6 billion, depending on how rapidly the _____ decreases
 - Current *average* fertility rate worldwide is _____ children per woman
 - Fertility rates vary: _____ in highly developed countries compared to _____ in some of the least developed countries
 - Even with most countries' active involvement with family planning, population _____ rates take time to change

Human Impacts on the Environment

- How many people the Earth can actually support is _____
 - This will depend on our ability to develop _____ agricultural practices that do not destroy the biological communities that support life on the planet
 - Consumption levels of _____ are also a factor



The Gap Between Rich and Poor Countries

- Countries are divided into rich and poor
- Rich countries are known as _____
_____ (HDCs)
 - Highly developed countries represent 18% of the world's population (US, Canada, _____)
 - They have complex industrialized bases, _____ rates of population growth, and _____ per person incomes.
 - People in highly developed countries consume _____ resources per person than people in developing countries

The Gap Between Rich and Poor Countries

- _____ (MDCs) have:
 - Medium levels of industrialization (_____ and Turkey)
 - Lower per person incomes, and _____ opportunities for education and health care than those in highly developed countries

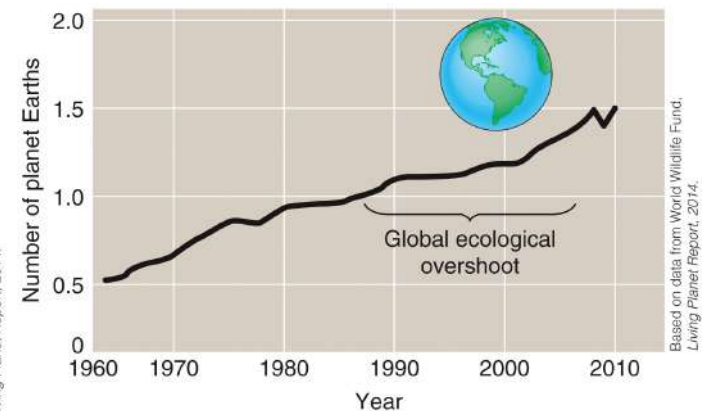
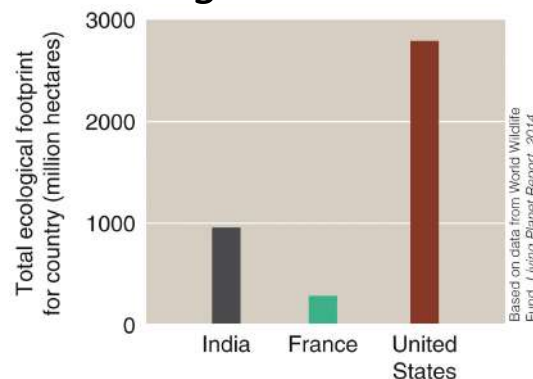
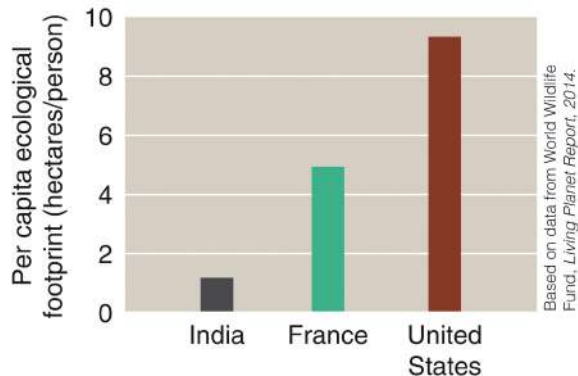
- _____ (LDCs) have:
 - Very _____ per person incomes relative to those in highly developed countries (_____ and Bangladesh)
 - Low levels of industrialization, most economies are _____
 - _____ population growth and infant mortality rates
 - Hunger, disease, and _____ are common

Population, Resources, and the Environment

- The high rate of _____ consumption in highly developed countries affects the environment as much as rapid population growth in other parts of the world
 - During rapid population _____, simply providing the essentials for survival can overwhelm a country's natural resources
 - Often a situation found in developing countries
- In _____ developed countries, consumption of natural resources far exceeds amounts needed for basic survival
 - This depletion of resources extends past the boundaries of individual countries and can affect resources _____
 - Continued high-consumption lifestyles now rely on _____ of resources from less developed countries to sustain them

Population, Resources, and the Environment

- Ecological footprint:
 - Amount of productive land, fresh air/water, and ocean, required to supply _____ person with food, wood, energy, _____, housing, clothing, transportation, and waste disposal
 - Allotted global footprint _____ acres
 - (Amount of Earth's productive land and water ÷ Global human population)
 - Average global footprint _____ acres
 - This results in an *ecological overshoot*

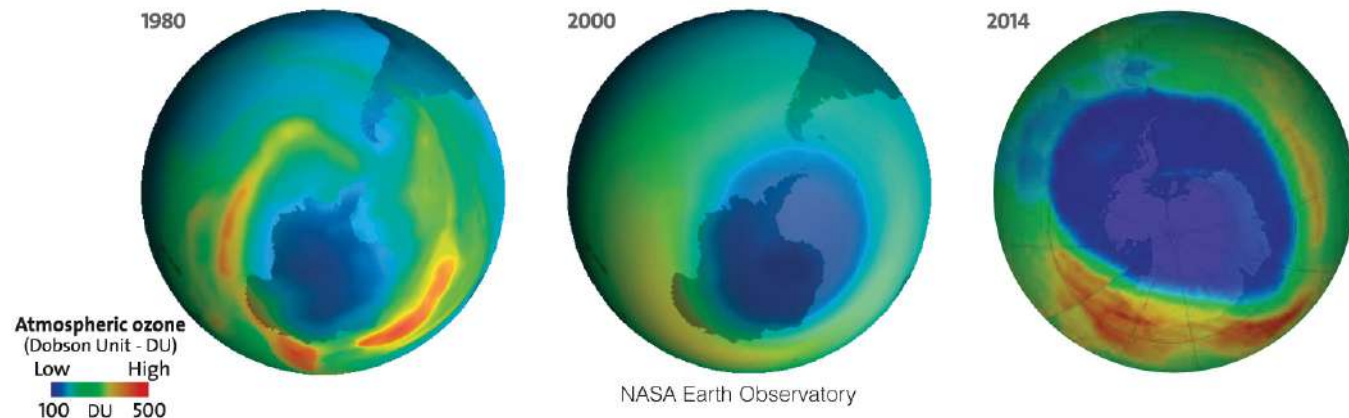


Sustainability and the Environment

- Sustainability:
 - The ability to meet humanity's current _____ without _____ future generations' ability to meet their needs
- Currently, human society is _____ operating sustainably, due to:
 - Use of _____ resources as if they were unlimited
 - Use of renewable resources _____ than they can be replenished
 - We are _____ the environment with toxins as if its capacity to absorb them was limitless
 - Population continues to _____
 - Human _____ disrupt many natural regenerative processes

Global Environmental Issues

- While climate variation is normal, global temperatures are _____ at an unprecedented rate.
- The removal of _____ is disrupting ecosystems.
- The _____ are being polluted and people are overfishing.
- Incorrect animal grazing and agriculture practices are causing fertile land to become _____.
- The _____, which protects us from harmful radiation, is thinning in certain areas.



Environmental Science

- Interdisciplinary study of humanity's _____ with other organisms and the physical environment
 - Combines information from many fields
 - Biology, _____, geology, geography, _____, economics, sociology (including demography), cultural anthropology, agriculture, engineering, law, politics, and ethics.
- The Goals of Environmental Science
 - Establish general principles about how the _____ world functions
 - Develop viable _____ to environmental problems
 - Identify, understand, and solve problems that we as a _____ have created
 - Focus on solving problems based on _____ knowledge

Science as a Process

- _____ :
- The way a scientist approaches a problem, by formulating a _____ and then testing it
- Five steps (see chart)

