


Human Population Studies

Current Population

- ▶ US
 - 328,311,975
(Net gain of 1 person every 19 seconds)
- ▶ World
 - 7,547,075,940
- ▶ As of 10:45 am 1/18/2019




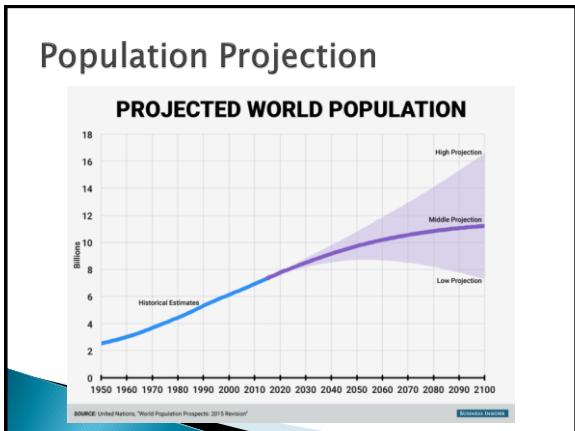
Historical Population Sizes

- ▶ 2000 years ago




Historical Population Sizes

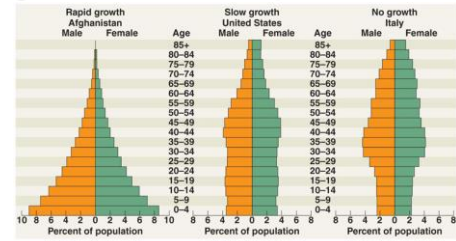
- ▶ surges in population
 - Tools and fire
 - Agricultural Revolution
 - Industrial Revolution
 - Medical Revolution

Population Age Structure

- ▶ breaks down the population by males/females
- ▶ percentage of in each AGE GROUP
- ▶ used to predict population growth

Age Structure Graphs



Why would we need to predict future population sizes?

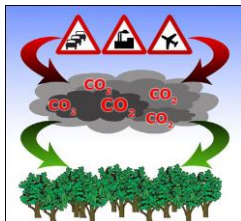
- ▶ Humans are the only organism that can increase their own carrying capacity....
- ▶ HOW??
- ▶ AT WHAT EXPENSE?

Human Impact

- ▶ Deforestation
- ▶ Burning fossil fuels
- ▶ Introduced species
- ▶ Agriculture
- ▶ Ozone
- ▶ Global warming
- ▶ Pollution

So what happens when we...

- ▶ How does cutting down trees effect the carbon cycle?

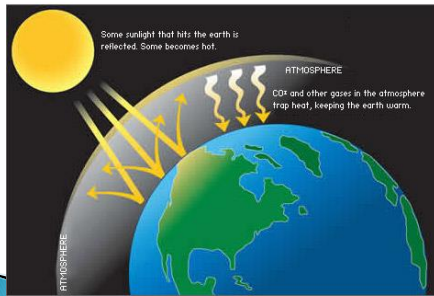


Deforestation

- ▶ cutting down all the vegetation
- ▶ leads to:
 - Increased levels of CO₂
 - Acid rain
 - Greenhouse Effect → Global Climate Change
 - Erosion
 - Habitat Destruction

Greenhouse Effect

The Greenhouse Effect

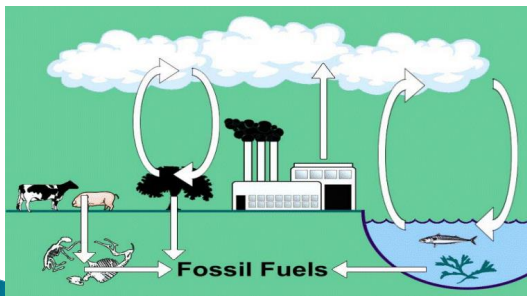


Acid Rain

- ▶ Normal rain has pH = 5.5
- ▶ Water in atmosphere mixes with compounds like CO₂ and SO₂ to form acids
- ▶ Acid rain = Rain with pH less than 5.0



Carbon Cycle: What do you see?



Introduced Species

- ▶ **Non-native species**— one that is introduced to a community and ecosystem by humans.
 - doesn't naturally start out as part of the ecosystem....
- ▶ What's the danger?

▶ **Invasive species**—

- no natural competitors → out competes natural organisms
 - no natural population "checks and balances" in community → spills over into other population niches.
- ▶ So what happens to the other populations?



Pesticide Use: Bioaccumulation & Biomagnification

- ▶ **Bioaccumulation**
 - As organism ages, it collects more of the contaminant
- ▶ **Biomagnification**
 - Higher on food chain = more contamination

Bioaccumulation



Contaminant Levels

Biomagnification

Contaminant Levels

Agriculture

- ▶ **Benefits?**
 - Job specialization
 - Allows settlement
 - Culture
 - Increased food availability
 - Predictable
- ▶ **Drawbacks??**
 - Habitat loss
 - Soil degradation
 - Erosion
 - Pollution





Global Warming

- ▶ What is it?
- ▶ Why is it "bad"?
- ▶ What is really going on?

Sea Level Rise

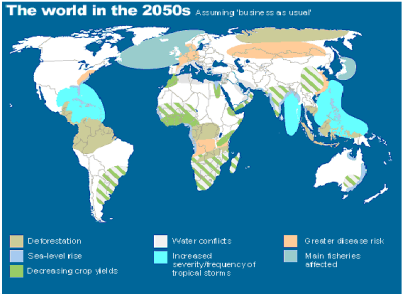
- ▶ Will we be underwater?

Sydney, Australia

The World in 2050

The world in the 2050s Assuming business as usual



- Desertification
- Sea-level rise
- Decreasing crop yields

- Water conflicts
- Increased severity/frequency of tropical storms

- Greater disease risk
- Main fisheries affected