



## Course Foundations

### People and the Environment



## People/Environment Relationships

- We all depend on the environment for our survival
- Problem: not all of us realize this fact
- Modern society makes it easy to ignore our natural environment and the ecosystems that support us

## People/Environment Relationships

- A good way of thinking about this situation: a two-way relationship
  - The environment has an impact on people, and the activities of people play a role in shaping the environment
  - **Q**: can you think of examples of both directions of this relationship? (i.e. nature having an impact on people, and people having an impact on nature)

People clearly have an impact on the environment, but the relationship is not one way only



## People/Environment Relationships

- Today, both directions of the people/environment relationship will give us a foundation for our discussion
  - 1. First, discussion of our impact on the environment, and introduction of our “ecological footprint” assignment
  - 2. Second, discussion of the impact of the earth on human populations, with a focus on a video case study examination of a recent disaster in Japan (2011 earthquake & tsunami)

## Our Impacts on the Environment

- Emphasis of this part of our discussion: the “big picture” on our impact on the environment
  - **Focus**: understanding our society’s “ecological footprint”
  - **Basic question**: what is an ecological footprint?

**The Ecological Footprint Concept**

- Ecological footprint, defined: a measure of the “load” imposed on nature by a given population (a city, state, country, etc.)
  - Analyzes the flow of goods and energy to and from the population
  - Represents the land area necessary to support the population’s demands (resource consumption, waste discharge)

**The Ecological Footprint Concept**

- Q: how does “land area” make sense as a means of defining or measuring a population’s impact on the environment?
  - What might be some alternative ways of measuring a society’s environmental impacts?

**The Ecological Footprint Concept**

- Key thought: we need some common way of measuring all of our various impacts (food, manufactured goods, housing, transportation, energy use, wastes)
  - Land area is not perfect as an impact measure, but it has some logical connection with almost everything we do as people

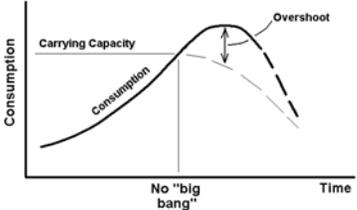
**Related Concepts**

- Carrying capacity: the maximum population of a species that can be sustained indefinitely in a given habitat



**Related Concepts**

- Overshoot: growth beyond carrying capacity



**Related Concepts**

- Overshoot: growth beyond carrying capacity
  - Key point: in the short term, you can overshoot carrying capacity with *no apparent consequences*
  - Q: how might a population overshoot carrying capacity and not “feel the pinch”?



### Related Concepts

- Fair earthshare: the amount of land each person would get if all ecologically productive land were to be divided equally among the current world population
  - A measure of what's available, not what we're using
  - If your fair earthshare were a circle, it would have a diameter of 510 feet (in area terms, 4.8 acres)



### Human Impacts: The Bottom Line

- How has fair earthshare changed over the last few decades? (again, a measure of what's available, not what we use)
  - Fair earthshare trends since 1900:
    - In 1900: 14.0 acres
    - In 1950: 7.5 acres
    - In 2007: 6.7 acres



### Human Impacts: The Bottom Line

- So, what are the comparable trends in our ecological footprint (a measure of what we use, not what's available)
  - Ecological footprint trends for the world's developed nations since 1900:
    - In 1900: 2.5 acres
    - In 1950: 5.0 acres
    - In 2007: 12.5 to 25 acres



### Human Impacts: The Bottom Line

- How does our ecological footprint in the US compare with other countries
  - Per capita footprints (2007 figures)
    - USA: 19.7 acres
    - Canada: 17.3 acres
    - India: 2.2 acres
    - World: 6.7 acres



### Human Impacts: The Bottom Line

- Key comparison
  - Fair earthshare: 6.7 acres
  - Ecological footprint: 6.7 acres
- Crucial questions: What happens when we get to overshoot? When do we start causing real damage?



### Ecological Footprint Assignment

- Getting more information about our consumption trends and patterns is an important input to our thinking
- Ecological footprint assignment: measuring our personal environmental impacts
  - Overall idea: complete an online questionnaire, consider your impacts, and what you could possibly change

**Ecological Footprint Assignment**

- Have a look at the assignment handout now
  - Complete the online questionnaire and assignment questions over the next few days
  - **This assignment is due at the beginning of class on Monday next week (along with your group's project proposal)**

**Ecological Footprint Assignment**

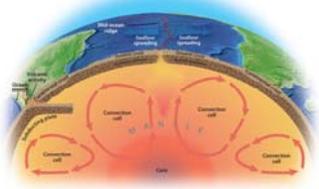
- Monday due date clarification (just to be clear)
  - *Ecological footprint exercise*: an individual assignment (every student hands in one for themselves)
  - *Project proposals*: a group effort (one proposal handed in for every group)

**Environmental Impacts on People**

- Some quick background relating to a video case study we will now view
  - As your reading covers, one of the key theories of modern earth science revolves around the idea of "plate tectonics"
    - The earth's surface is comprised of large plates that are constantly shifting in orientation
    - This plate movement accounts for many of the most significant geological features present on the earth's surface

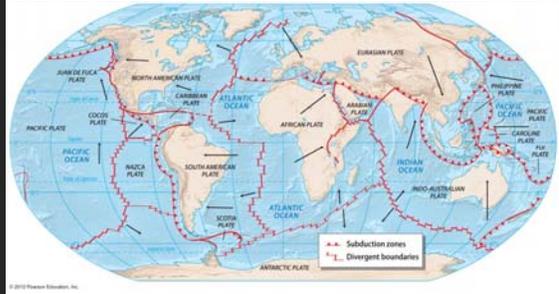
**Environmental Impacts on People**

- Your reading includes a good graphic that summarizes this tectonic concept
  - Key driver: movement of magma deep under the earth's surface, propelling plate movement



**Environmental Impacts on People**

- Plate tectonics are working to shape and re-shape the entire earth surface
- However, certain places on the globe are particularly impacted by plate movements: zones where plates join



**Environmental Impacts on People**

- Such zones are particularly vulnerable to earthquakes, among other disruptions
  - Our video case study today focuses on one of the most violent interactions that humans have had with plate tectonics in recent decades: the March 11, 2011 disaster impacting the east coast of Japan



**Environmental Impacts on People**

- The video case study we will view comes from the PBS series *Nova*
  - Please use the provided handout to guide your viewing of this video
  - The handout questions will help you note the key concepts you need to get out of the video

[Japan's Killer Quake](#)