CH 10: Land Resources

Chocolate Chip Mining Activity p. 19NB

- How would you change your mining techniques to make more money next time?
- How did your mining techniques change when you were fined for breaking the cookie?
- How does all this relate to real mines?
- Trace your surface area after each mining of each cookie.
- How much surface area was destroyed for each cookie?

TED Talk

- http://www.ted.com/talks/garth_lenz_images_of_beauty_and_devastation#t-31236
- Take notes on pg. 23
- Fish Ladder – American River at Nimbus Fish Hatchery

What's the answer?

- A rare rock formation is found 300km from a matching formation. The continent on which it is found is part of a plate that is moving at a rate of 35mm/year. Which most closely approximates how many years ago the matching rocks were separated.
- 8,300,000 years

4/4 Human Land Use CH 10

Obj. TSW identify and explain the Tragedy of the Commons, externalities and maximum sustainable yield pg. 18

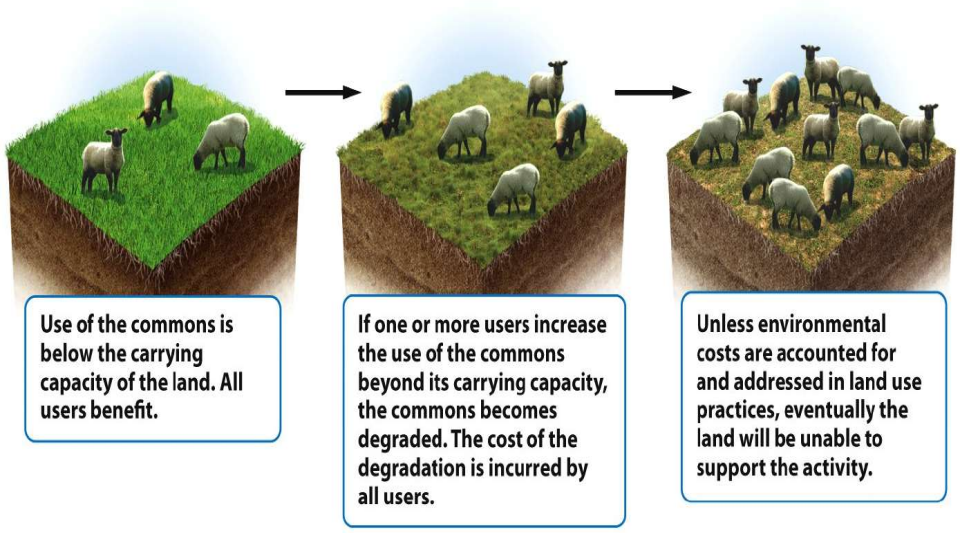


Figure 10.2
Environmental Science

1. Explain the Tragedy of the Commons. What is an example for today's world?
2. Explain an externality.
3. Copy the Maximum Sustainable yield (10.3), what graph does it remind you of?

The Tragedy of the Commons

- 1968: Garrett Hardin described the “Tragedy of the Commons”
- The tendency of a shared, limited resource to become depleted because people act from self-interest for short-term gain
- Observed that when many individuals share a common resource without agreement on or regulation of its use, likely to become overused very quickly

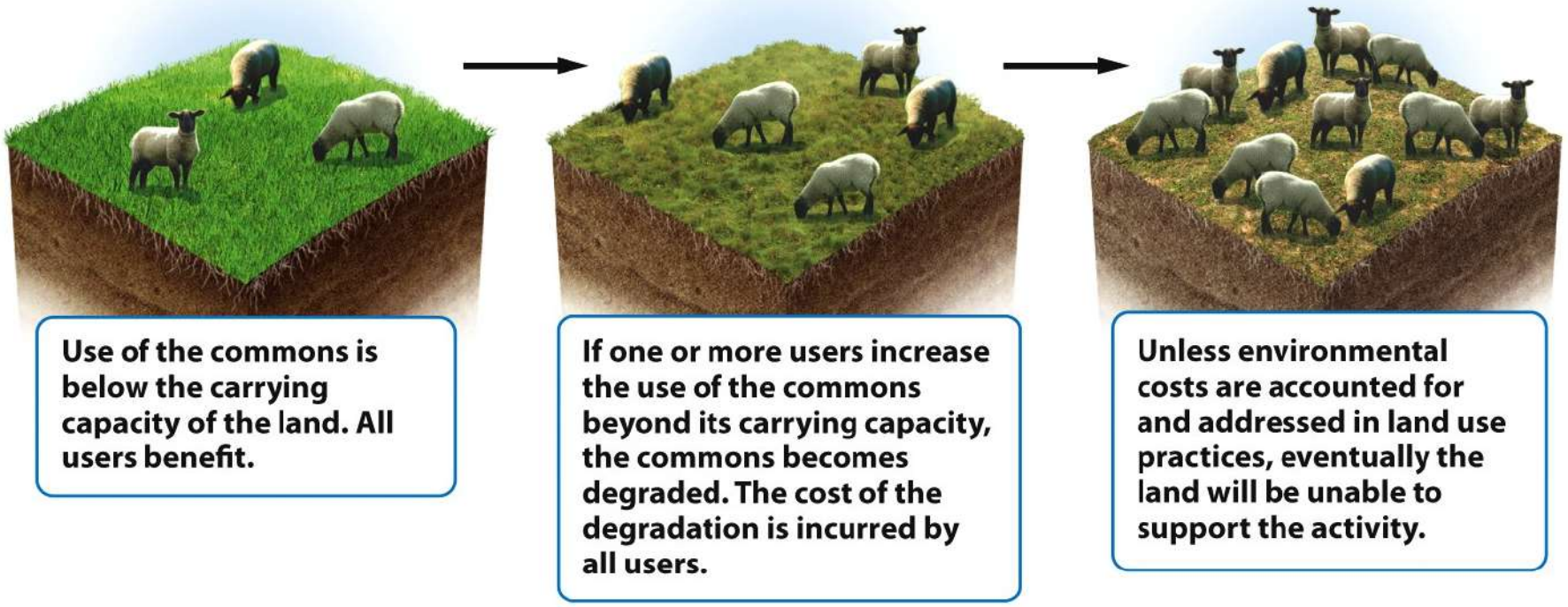


Figure 10.2
Environmental Science

Externalities

- A cost or benefit of a good or service that is not included in the purchase price of the product or service
- We are concerned about negative externalities because of the environmental damage for which no one bears the cost
- EX) Factory Polluting surrounding areas
- Solutions:
  - Privatization
  - Regulation

(EX) Unicorn Populations

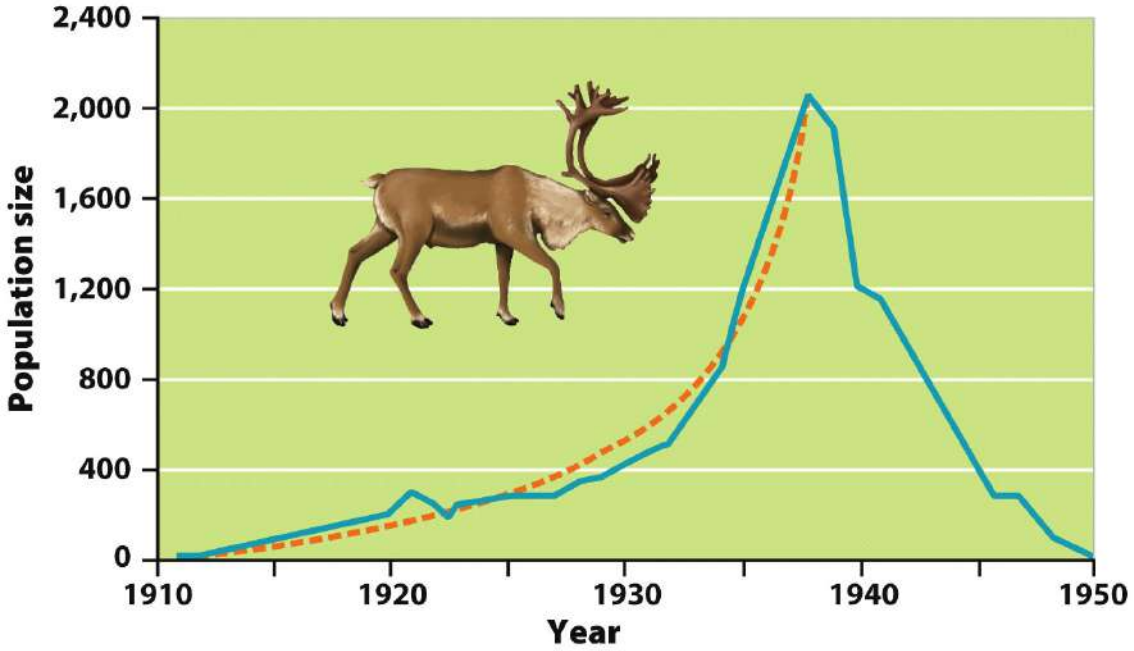


Figure 6.8
Environmental Science

(1) Unicorn population not checked= Population grows so much, not enough food to support it= population crashes
(2) Hunting is unregulated= unicorn population depleted to point of endangerment

Intermediate Amount of Regulation= Leave enough to reproduce at a rate that main the population but not have competition for food

Maximum Sustainable Yield

- The maximum amount of a renewable resource that can be harvested without compromising the future availability of that resource.

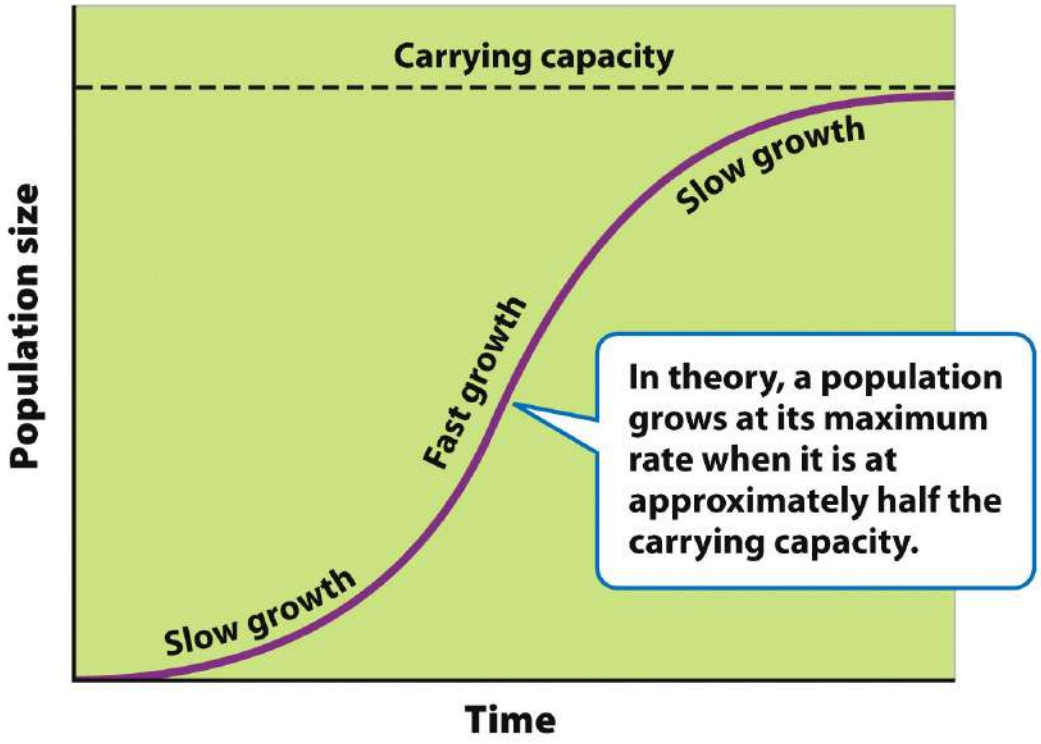


Figure 10.3
Environmental Science

- Sustainable harvesting
- Hard to calculate but...

Surface Mining Activity pg. 21

- Groups of 4, go over to the shoe boxes
- Each group (company) needs a name; Distribute the jobs accordingly
  - Field Geologist/Accountant
  - Miner
  - Process Engineer
  - Environmental Engineer

  - Complete activity and then answer Questions and Analysis for homework, answer on pg. 23 or separate page if no room

4/5 CH 10 Land Management

Obj. TSW identify and explain how land is classified, how land is used, and what the impacts of our use are.

P. 20 NB

1. Explain how our use of land affects the environment.
2. What are the main uses of public lands in the US?
3. What is resource conservation ethic and how does it relate to multiple use lands?

Figure 10.10
Environmental Science

Disruption Video

- Disruption video Trailer

Tragedy of the Commons Clarification

- Oil→ Because there is a limited supply, oil companies know that in order to maximize profit, they have to extract as much as they can
- Idea of Tragedy of the Commons is “common pool resources”
- Air, water, other natural resources that people DON’T own
- People at some point own the oil because they own the land
- But you can’t ever really own air or the ocean

Negative consequences of land use

Figure 10.1a
Environmental Science

Mudslide caused by logging & poor land management.

Figure 10.1b
Environmental Science

Habitat conversion & land degradation due to shifting agriculture.

Logging and other habitat alteration can adversely affect species like the spotted owl.

Extensive paving of land decreases the amt of land for vegetation and water infiltration.

Figure 10.1d
Environmental Science

Protected land and marine areas of the world

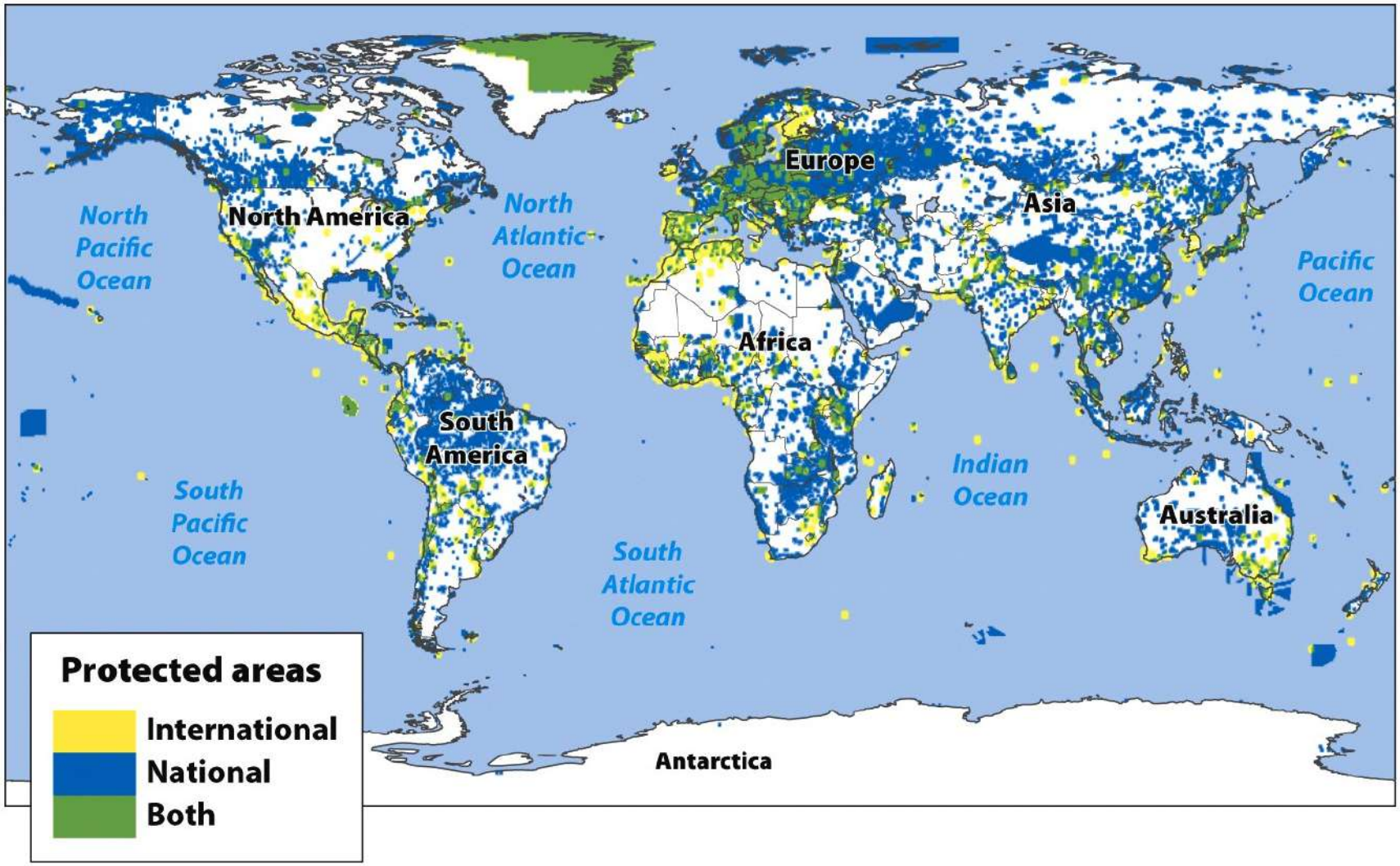


Figure 10.4
Environmental Science

Public Lands

- National Parks
- Managed Resource Protected Areas
- Habitat/Species Management Areas
- Strict Nature Reserves and Wilderness Areas
- Protected Landscapes and Seascapes
- National Monuments

Public Lands

- National Parks- managed for scientific, educational, and recreational use, and sometimes for their beauty or unique landforms.
- Managed Resource Protected Areas- managed for the sustained use of biological, mineral, and recreational resources.
- Habitat/Species Management Areas- actively managed to maintain biological communities.
- Strict Nature Reserves and Wilderness Areas- established to protect species and ecosystems.
- Protected Landscapes and Seascapes- nondestructive use of natural resources while allowing for tourism and recreation.
- National Monuments- set aside to protect unique sites of special natural or cultural interests.

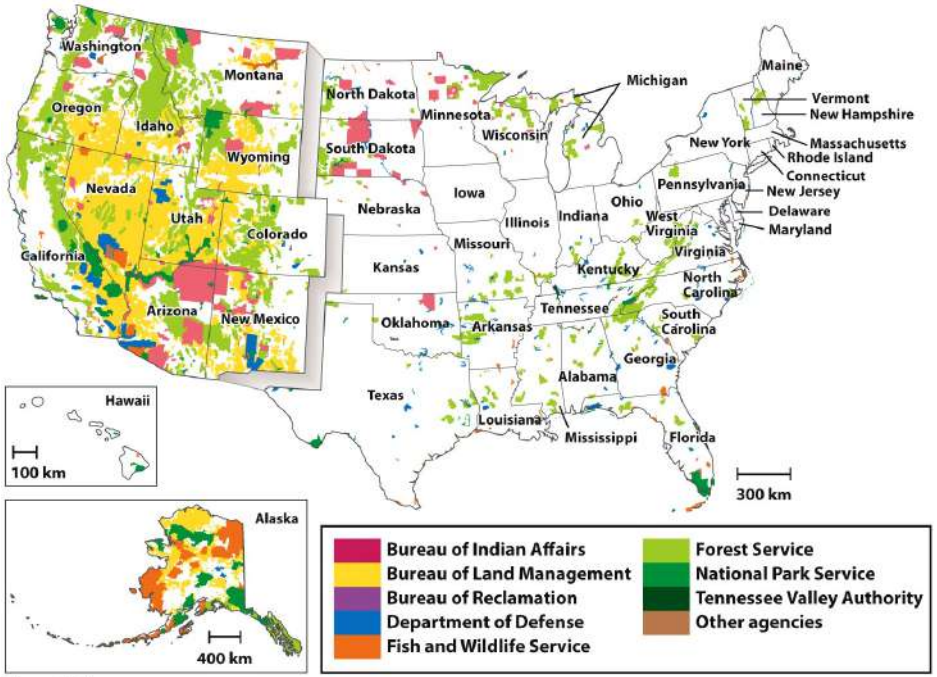


Figure 10.5
Environmental Science

Federal Lands in the US

42% of land in US is Publically owned

25% is owned by the Federal Government

Land Use in the US

- Rangelands, National forests, National parks, National Wildlife Refuges, Wilderness areas

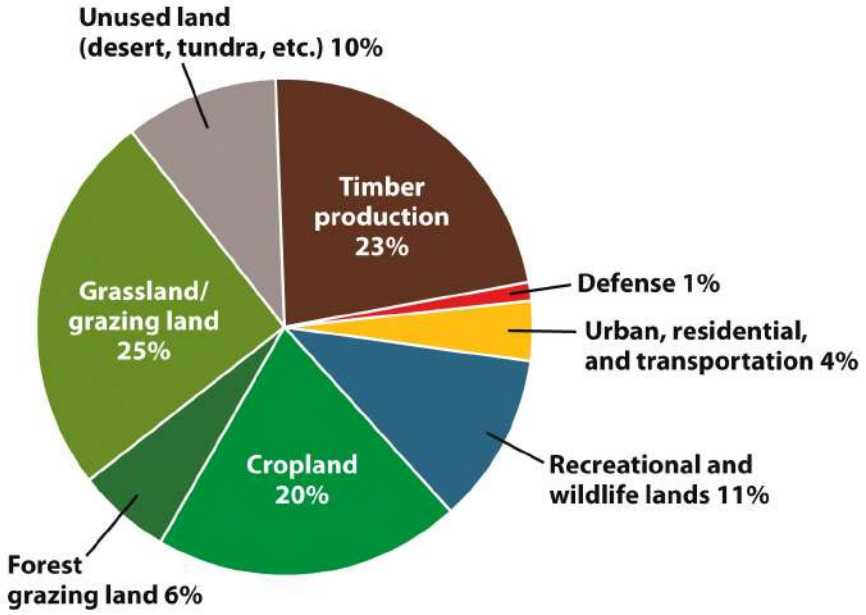
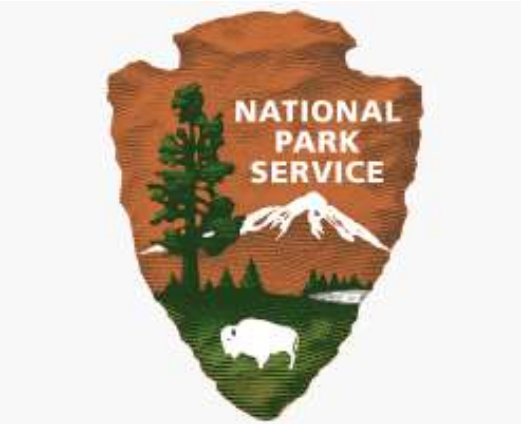


Figure 10.6
Environmental Science

Public Land Classification

- Most environmental policies, laws, and management plans have been based on **Resource Conservation Ethic**
  - Calls for policy makers to consider the instrumental value of nature
  - People should maximize resource use based on the greatest good for everyone
  - Areas are preserved and managed for economic, scientific, recreational, and aesthetic purposes
- **Multiple-Use Lands:**
  - Because purposes conflict → adopted principle of multiple use in managing its public resource
  - Can be used for recreation, grazing, timber, harvesting, and mineral extraction

Agencies



- Bureau of Land Management (BLM):
  - Grazing, Mining, Timber harvesting, Recre
- United States Forest Service (USFS):
  - Timber harvesting, Grazing, Recreation
- National Park Service (NPS):
  - Recreation, Conservation
- Fish and Wildlife Service (FWS):
  - Wildlife conservation, Hunting, and Recre

4/6 Human Land Use CH 10

Obj. TSW identify and explain how rangelands and forests are managed and which agency manages them P. 22 NB

1. Explain how Rangelands are managed and who manages them if they are public land?
2. What are the ways in which timber is harvested in US forests?
3. Who manages them if they are public land?

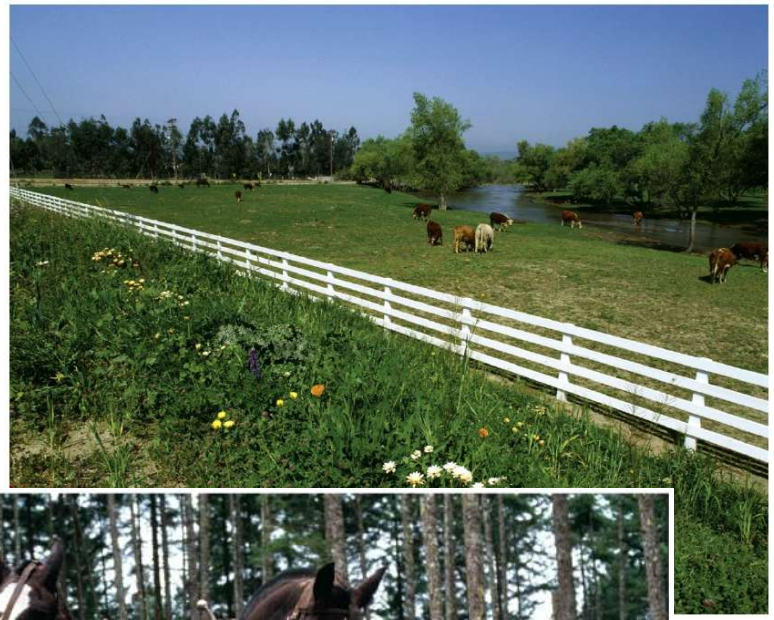


Figure 10.10
Environmental Science

Rangelands (BLM)

- Dry, open grasslands that are primarily used for cattle grazing.
- When it is poorly managed, overgrazing can strip the land of vegetation, decrease the rate of regrowth, & increase compaction of soil.
- Lack of vegetation increase the rate of erosion by wind and valuable nutrients and soil can blow away.

Figure 10.7
Environmental Science

Forests (USFS, BLM)

- Areas dominated by trees and other woody vegetation.
- Sustainable forestry, although not profitable using a team of Shire horses.
- Commercial logging companies allowed to use US National Forests, in exchange for a royalty (% of revenues)

Figure 10.10
Environmental Science

Timber Harvest Practices

- **Clear-cutting**- removing all, or almost all the trees in an area.
- **Selective cutting**- removing single trees or relatively small numbers of trees from a forest.

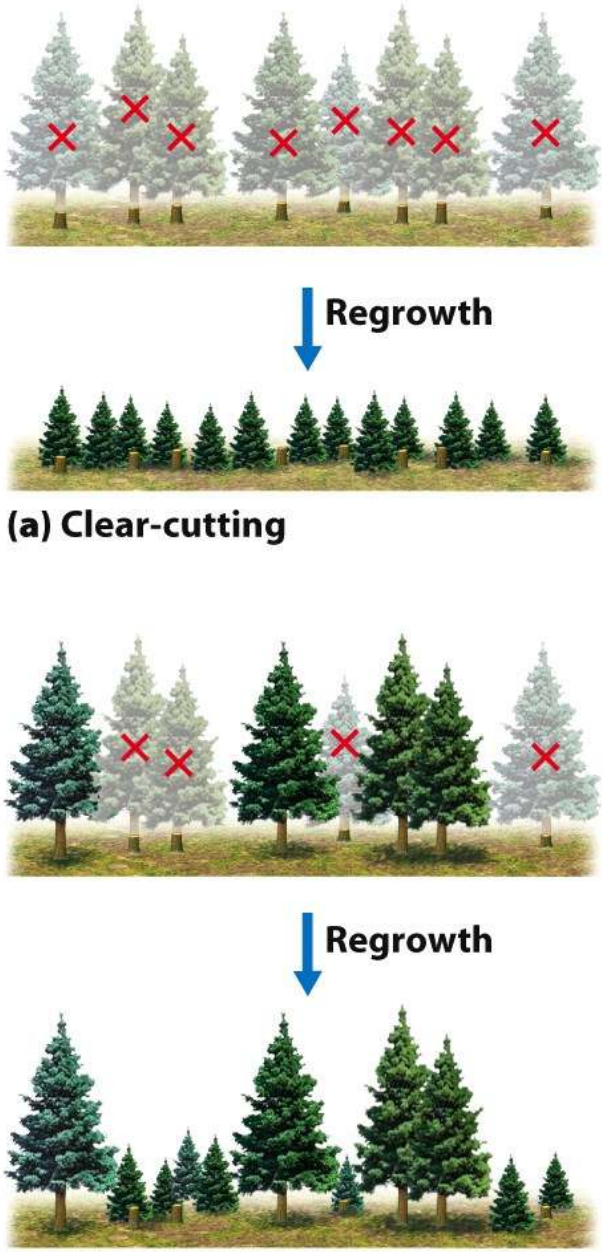


Figure 10.8
Environmental Science

Clear Cut Forest

Damaging Effects of clear cutting: Increased erosion, decreased regeneration of vegetation, habitat destruction, sensitive species are threatened.

Eureka CA

Figure 10.9
Environmental Science

Fire Management

- Prescribed burns- A fire is deliberately set under controlled conditions.
- Yellowstone 1988 fire was started by a combination of human activity and lightning strikes.
- More than 1/3 of Yellowstone burned.
- Created new, nutrient rich habitat= benefits to the ecosystem

Figure 10.11a
Environmental Science

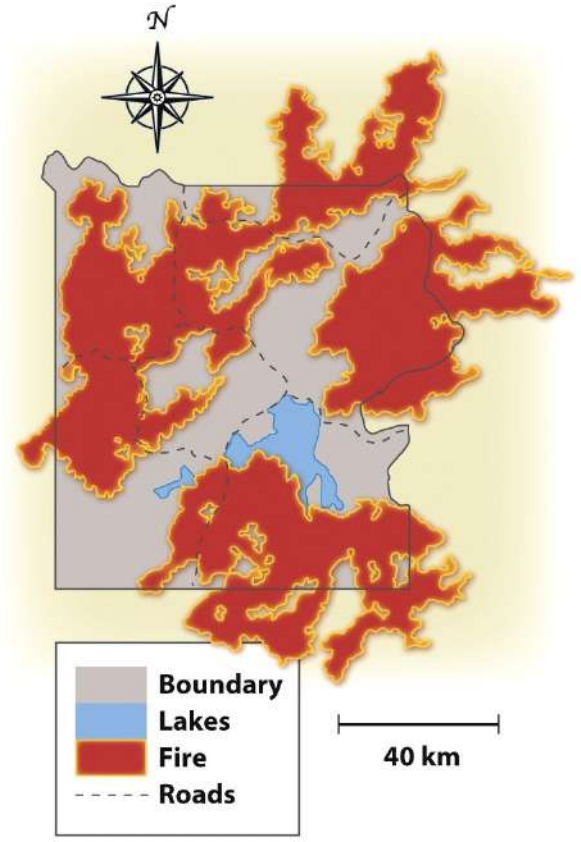


Figure 10.11b
Environmental Science

After Quiz Pick up...

- Notebook: 35 points
- CH 11 MC SG, pg. 29 NB, due Tuesday (11/4)
- CH 11 Vocab/2 AXES paragraphs, pg. 31 NB, due Wednesday (11/5)
- How Many Planets? Worksheet, pg. 27

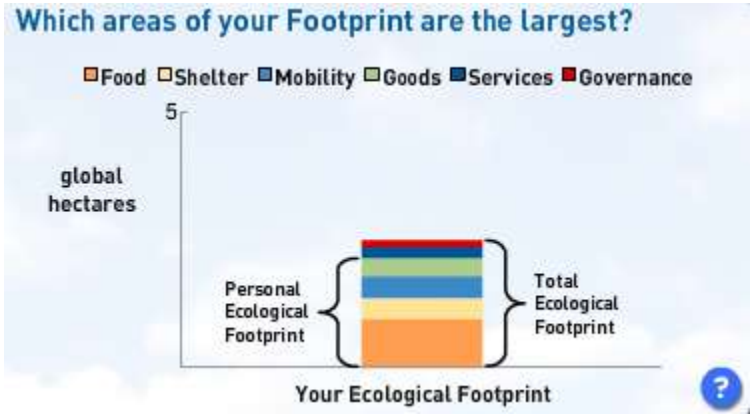
- Reminders for Tomorrow:
  - **Permeability and Porosity Labs** Due Tomorrow!!!
  - **Ecocolumn supplies!** (We are starting to build tomorrow, fishes by Friday!)

How Many Earths? (25 points total)

- **Pre-reading "World Footprint" Article** (5 points)
- Work individually (BUT 3 groups of 2)
- **Worksheet and How Many Earths? Google Form**
  - Fill out worksheet (5 points)
  - Google form (5 points)
  - Individually complete **answers at the end** of worksheet(8 points)
- **Ticket out** turn to me before leaving (2 points)
- Turn everything in to ME by Friday (10/31)!

- Take your best guess if you are unsure of an answer!
- When you pick another nation...
- 1Km = 0.6214 miles
- South Africa:
  - 1 Rand = 0.092 US Dollar
- China:
  - 1 Yuan = 0.16 US Dollar
- Turkey:
  - 1 Try = 0.45 US Dollar
- India:
  - 1 Rupee = 0.016 US Dollar
- Things will be different so just take your best guess!

Question 10e (Instead of pie chart, will look like this):



Ticket out

- On a scratch piece of paper, answer the following:
  - What about this activity did you like?
  - What about this activity would you improve for next time?

In the News...

Here's How San Francisco is Bracing for Sea Level Rise Estimated to Impact $48 Billion in Assets

By Zoe Sullivan

October 24, 2014 | 3:40 pm

San Francisco's Capital Planning Committee (CPC) has adopted what is being called the most comprehensive guidelines in the nation for preparing for the impacts of sea level rise on a city's infrastructure.

"This is the first time that I've seen a city really actively assessing the risks to new public investments," Jessica Grannis of Georgetown's Climate Center told VICE News.

The guidelines assume sea level rise of 11 inches, plus or minus 4 inches, by 2050 and as much as 66 inches by 2100.

San Francisco's Pacific coastline, the Embarcadero, a roadway and pedestrian promenade along the city's eastern and northern coastline, the Port of San Francisco, and the San Francisco International Airport already experience periodic flooding.

Under the guidance, which was adopted by the CPC in September, each city department is required to assess the impact of sea-level rise when improvements to existing infrastructure are being considered and when developing new capital projects, such as a police station, visitor center, or a shoreline park.

It requires the departments to estimate the amount of sea-level rise for the proposed location, the potential impact of storm surges, and the likelihood of flooding.

4/7 Residential Land Use is Expanding CH 10

Obj. TSW explain and distinguish between urban, rural, and suburban areas and relate the causes and effect of urban sprawl to smart growth practices in new development. P. 24NB

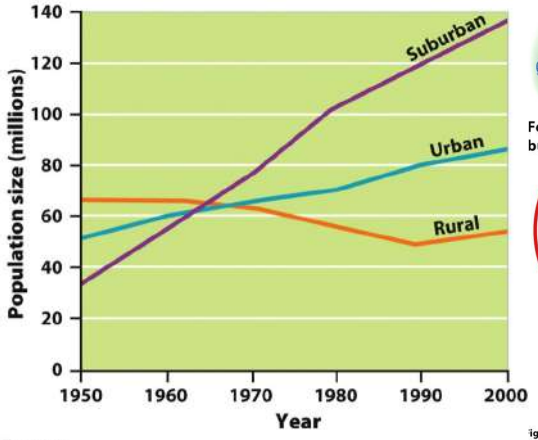


Figure 10.13
Environmental Science
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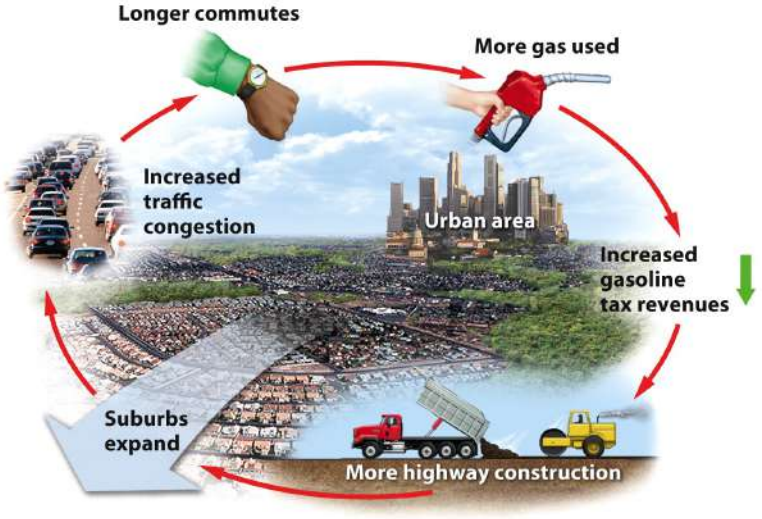

Figure 10.15
Environmental Science
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1. Explain NEPA and what they require before a project can begin.
2. Identify and explain what the 4 main causes of Urban sprawl?
3. List 3 of the 10 basic principles of smart growth.

Federal Regulations

- **National Environmental Policy Act (NEPA)-** mandates an environmental assessment of all projects involving federal money or permits.
  - Creates an environmental regulatory process designed to ensure protection of nation's resources
- **Environmental impact statement (EIS)**- outlines the scope and purpose of the project.
- **Environmental mitigation plan**- outlines how the developer will address concerns raised by the projects impact on the environment.

Residential Land

- **Suburban**- areas surrounding metropolitan centers with low population densities.
- **Exurban**- similar to suburban areas, but are not connected to any central city or densely populated area.

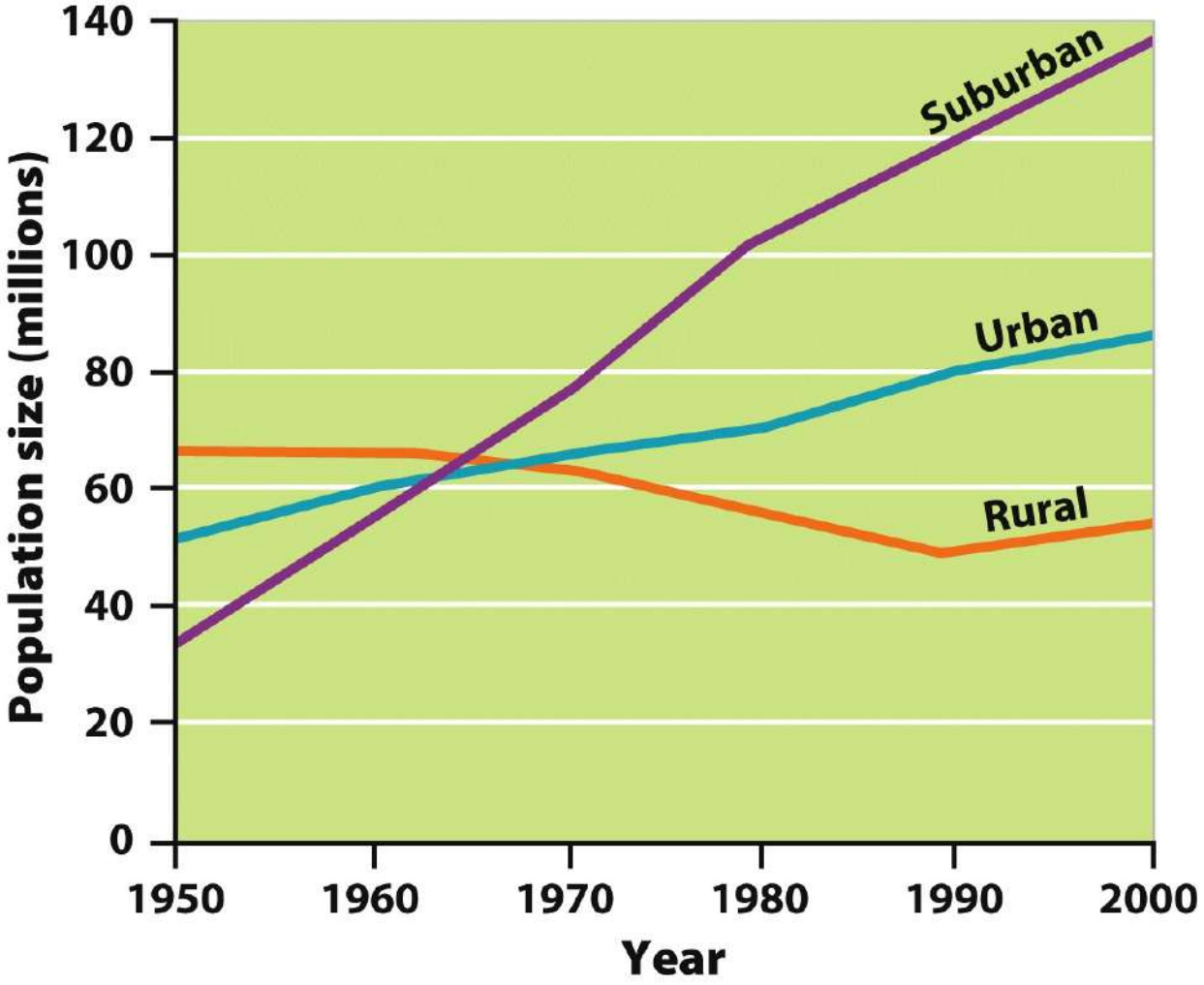

Figure 10.13
Environmental Science

- Population shifts have brought new environmental problems:
  -Urban sprawl
  -Urban blight

Urban Sprawl

- The creation of urbanized areas that spread into rural areas
- Cluster of houses, shops, etc. separated by miles of road
- Reliance on cars, increasing distance between farmers and consumers

Urban Sprawl

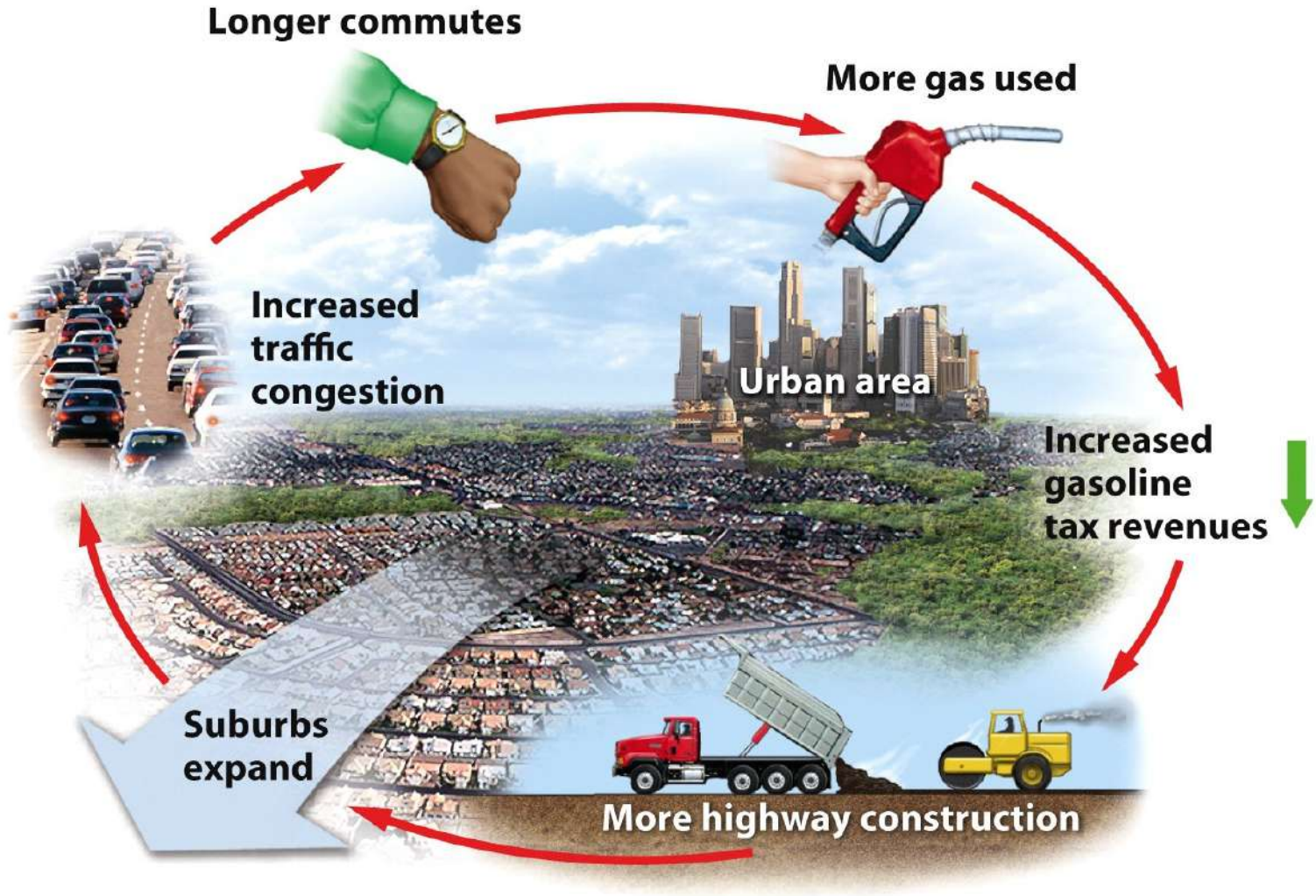

Figure 10.15
Environmental Science

Urban Sprawl

- The four main concerns of urban sprawl in the U.S. are:
  - Automobiles and highway construction (possible to work/play in city and live somewhere else)
  - Living costs (people can get more land and a larger house in the suburbs for the same amount of money)
  - Urban blight (city revenue shrinks as people move to the suburbs)
  - Government policies

Urban Blight Loop

- Degradation of the built and social environments of the city that often accompanies/ accelerates migration to the suburbs

Figure 10.14
Environmental Science

Government Policies

- Highway Trust Fund- a federal gasoline tax to pay for construction and maintenance of roads and highways.
- Zoning- a planning tool to create quieter and safer communities. For example, prohibiting the development of a factory or strip mall in a residential area.
- Multi-use zoning- allows retail and high-density residential development to coexist in the same area.
- Subsidized mortgages- low interest rates offered to people to purchase a home that would otherwise not be able to do so.

Smart Growth

- Mixed land uses
- Create a range of housing opportunities and choices
- Create walkable neighborhoods
- Encourage community and stakeholder collaboration in development decisions
- Take advantage of compact building design
- Foster distinctive, attractive communities with a strong sense of place
- Preserve open space, farmland, natural beauty and critical environmental areas
- Provide a variety of transportation choices
- Strengthen and direct development toward existing communities
- Make development decisions predictable, fair and cost-effective

Light Rail System

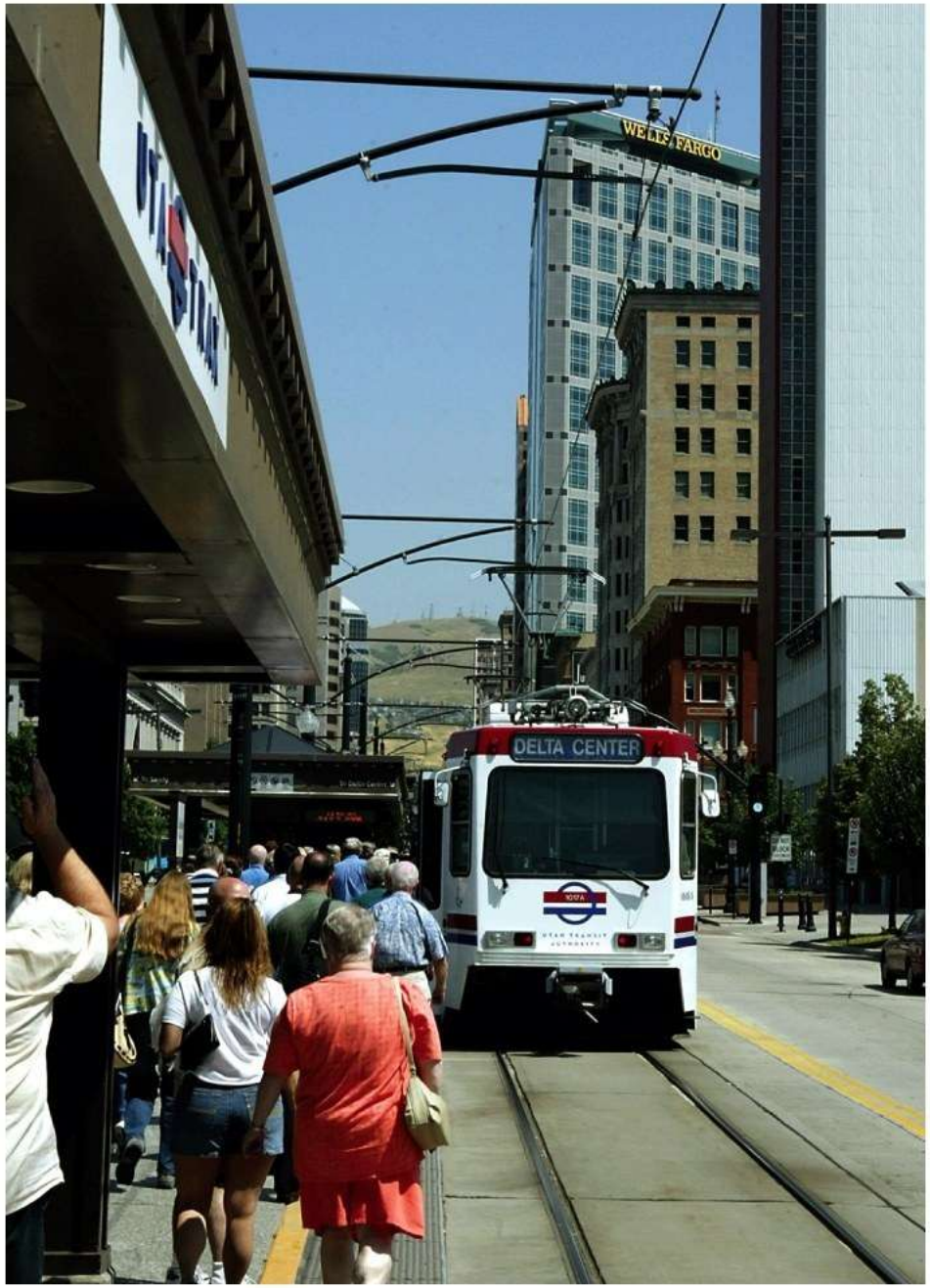

Figure 10.17
Environmental Science

4/8 Sustainability CH 10

Obj. TSW explain and give examples of how individuals, communities, & cities can work toward being sustainable. P. 26 NB

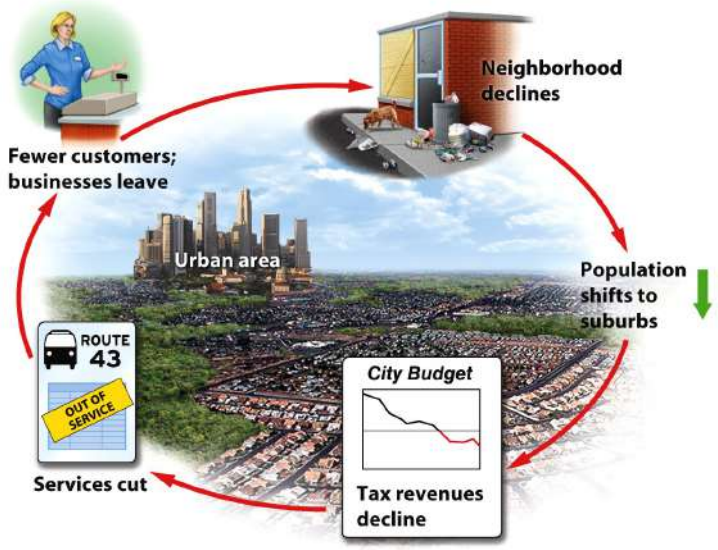

Figure 10.14
Environmental Science
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1. What is urban blight, what examples can you come up with in West Sac?
2. Describe in your own words "Eminent domain."
3. What actions did the Dudley Street Neighborhood Initiative do?

Urban Blight Loop

- Degradation of the built and social environments of the city that often accompanies/ accelerates migration to the suburbs

Figure 10.14
Environmental Science

Eminent Domain

- The government can (and does) seize private property for public use - to build a road, a school or a courthouse
- Give owners “fair market” value of home, acquire property even if owners don’t want to sell

But did you know the government can also seize your land for private use if they can prove that doing it will serve what's called "the public good"?

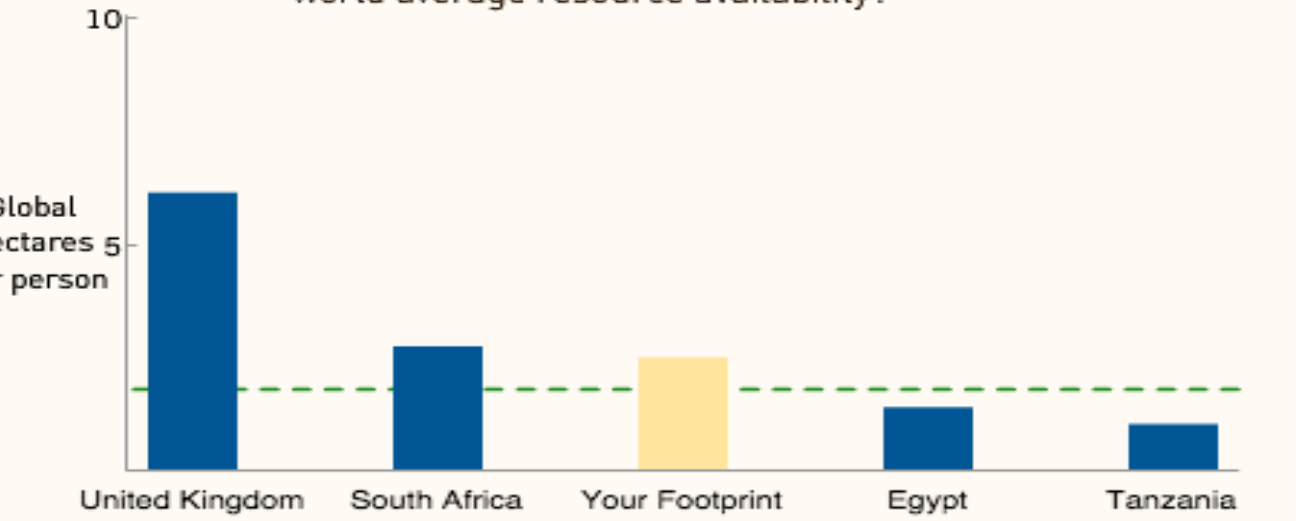
Cities across the country have been using eminent domain to force people off their land, so private developers can build more expensive homes and offices that will pay more in property taxes than the buildings they're replacing.

The Dudley street neighborhood in Boston, MA

Figure 10.18
Environmental Science

World average biocapacity is 1.8 global hectares per person as shown by the dotted line below.

Where does your Footprint stand compared to other nations, and to our world average resource availability?



Energy (70% of Calgary's Footprint):

- Reduce your household energy use – turn down your thermostat when not occupied and at night, use energy efficient bulbs and replace appliances with Energy Star® rated models, add insulation and draft proofing.

- Use public transit, carpool, ride a bike or walk. Keep tires properly inflated, have your vehicle properly tuned and avoid idling.

Local Foods:

- In season, purchase locally grown foods that require less transportation and processing to get products to market.

Goods:

- Reduce consumption of one-time use products. Purchase re-usable products when possible. Avoid products that produce excess waste. Purchase goods that are made locally to reduce their transportation Footprint.

Emerald Jewel Wasp Video

TED Talk

EMINENT DOMAIN: BEING ABUSED?

Is Seizure Of Private Property Always In Public's Interest?

be fair market value.

But now, people who don't want to sell their homes at any price - just to see their land go to another private owner - are fighting back. Correspondent Mike Wallace reports on this story, which first aired last fall.

Jim and Joanne Saleet are refusing to sell the home they've lived in for 38 years. They live in a quiet neighborhood of single-family houses in Lakewood, Ohio, just outside Cleveland.

The City of Lakewood is trying to use eminent domain to force the Saleets out to make way for more expensive condominiums. But the Saleets are telling the town, "Hell no! They won't go."