Section IV: Land & Water AP TIPS

- **Federal Lands**
  - Put the "wild" back in wilderness: National Wilderness preservation System = most restricted; National Forests = most use
  - Forests
    - Old growth (Ex. Alaska) – lots of biodiversity
    - Harvesting Methods
      - Selective & Strip cutting (best environmental)
      - Clear cutting (worst environmental; best economical)
        - Erosion
        - Habitat destruction/fragmentation → disrupts gene flow; disrupts food webs → decreases biodiversity
        - Net increase in CO_2, a GHG, can lead to GCC
        - Increase sunlight increases water temperatures
    - Fires
      - Surface = good (prevents more destructive fires, release nutrients, stimulates germination of seedlings)
      - Crown = bad (habitat destruction, erosion, species death)
- **Urbanization**
  - Urban sprawl (b/c cheaper) → increased commuting time (increased pollutants such as NOx and GHG such as CO_2); increased habitat destruction/fragmentation
  - Urban heat island
    - Heat generated by cars, factories, industry, AC, & dark-heat absorbing roofs – little/no wind
  - Not self – sufficient (food grown elsewhere; electricity from power plants)
  - Smart Growth
    - Mixed use (ex. retail stores on bottom, residential on top – like "Americana" or "Paseo")
    - Greenspace (parks, plant vegetation to absorb CO2, filter air, provide habitats for wildlife
    - Community supported agriculture/roof-top gardens/balcony gardens → grow local!
    - Renewable energy ex. solar on roofs
    - Sustainable building materials (ex. bamboo, triple-paned windows, south-facing windows, insulation)
    - Walkable neighborhoods; public transportation
- **Food Supply**
  - *Croplands*
    - Wheat, Rice, Corn
    - Industrialized Agriculture – Green Revolution

- Fossil fuels to run machinery
    - Pollutants ex. NOx
    - GHG ex. CO2
- Monoculture
- GMO
- Fertilizers
    - Nitrates run-off = eutrophication
- Pesticides
    - Chemicals – endocrine disruptors?
    - DDT, Rachel Carson – "Silent Spring"
    - Pesticide treadmill
- Result: increased crop yields; economic advantage

▪ *IPM*: Integrated Pest Management
- Ok to use pesticides, but reduces use
- Biological controls (ex. ladybugs to eat aphids)
- Spray hot water on pests
- Cultivation practices (ex. crop rotation)

o *Rangelands (grazing land/cattle)*
▪ Ecology- dry/arid; drought tolerant plants
▪ Overgrazing- too many cattle grazing for too long in too small of an area =
▪ Desertification & erosion

o *Feedlots*
▪ Raise animals in crowded conditions
▪ Issues:
- Increased use of antibiotics
    - Bacteria = r-selected species and can mutate/become resistant to antibiotics
- Increased use of growth hormones
    - Endocrine disruptor?
- Cattle belch methane (CH_4) = GHG and can lead to GCC
- Waste high in nitrates – runoff into aquatic systems = eutrophication

▪ Solution:
- Eat more fish & chicken; less beef & pork
- When eating beef: choose organic, grass-fed beef for better health & environmental consequences

o *Fisheries*
▪ World-wide (oceanic) fisheries: Tragedy of the Commons
- Depletion of a public/commons resource (fish)

▪ Fishing methods
- Long line, drag net, sonar

▪ Aquaculture analogous to growing fish in "feedlots" – same problems
▪ Solution: aquaponics? Limit fish catch per day

- **Mining**
  - Surface Mining vs Subsurface
  - Environmental effects
    - Erosion
      - Sedimentation in aquatic system s = turbidity (fish have problems breathing through gills/plants can't "see" to photosynthesize)
    - Habitat destruction/fragmentation → disrupts gene flow/disrupts food webs → decrease biodiversity
    - Acid mine drainage due to acidic run-off from coal tailings (wastes)
      - Decreases pH of aquatic systems → species w/ low range of tolerance (ie trout) die → disrupts food webs & decreases biodiversity
- **Global Economics**
  - GNP = economic indicator of country
  - Full/Total cost pricing
    - Environmental viewpoint that we should include *externalities* (ex. pollution) in cost of good