**AP Environmental Science Fall Semester Exam Study Guide**

**Ch. 1: Introduction to Environmental Science**

1. Explain the difference between renewable and nonrenewable resources.
2. What is the “tragedy of the commons?”
3. What is an ecological footprint? How much is humanity currently overshooting Earth’s capacity due to the global ecological footprint?
4. What do sustainability and the triple bottom line have to do with each other?

**Ch. 2: Ethics & Economics**

1. What factors shape our worldviews and perception of the environment?
2. Are you a relativist or a universalist?
3. Explain the views of anthropocentrism, biocentrism, and ecocentrism.
4. Explain the difference between preservation and conservation.
5. Describe the following types of economies: subsistence, capitalist, centrally planned (socialists), mixed.
6. How do economies and the environment affect one another?
7. Contrast GDP and GPI. What factors does GPI take into consideration when determining the progress a country has made in terms of economics?
8. What are some ecosystem services that the environment provides? How might these assigned monetary value?
9. What is ecolabeling?
10. What does per capita mean?

**Ch. 3: Environmental Policy**

1. What are the primary goals of environmental policy?
2. What do the following legislative, executive, and judicial branches of government consist of and what are their jobs?
3. Describe the 3 waves of environmental policy in the United States.
4. Who is Rachel Carson? What book did she write, and what is its importance?
5. What is NEPA and what has it accomplished?
6. What is the EPA and what are some things for which it is responsible?
7. What are the goals of the following organizations: United Nations, European Union, World Trade Organization, World Bank?
8. Explain the approaches to environmental policy such as the command-and-control approach, subsidies, green taxes, and permit trading.

**Ch. 5: Evolution, Biodiversity, and Population Ecology**

1. Explain the logic of natural selection.
2. Describe directional, stabilizing, and disruptive selection and their outcomes.
3. What have we gained from artificial selection?
4. Contrast allopatric and sympatric speciation.
5. List the levels of ecological organization from smallest to largest.
6. What might an organism’s niche include? Explain the difference between a fundamental niche and a realized niche. (Ch. 6)
7. How is population density calculated?
8. Explain three types of population dispersion.
9. Contrast density dependent and density independent limiting factors.
10. Differentiate between r-selected species and k-selected species.

**Ch. 6: Species Interactions and Community Ecology**

1. Know the zebra mussel case study!
2. Explain interspecific and intraspecific competition and the implications of each.
3. Describe the following community interactions: competition (inter- & intraspecific), predation, parasitism, herbivory, mutualism, ammensalism, commensalism.
4. Describe how energy flows through ecosystems from autotrophs, heterotrophs, decomposers, etc. How much energy gets transferred to the next level?
5. Contrast primary and secondary succession.
6. Know how to read a climatograph.
7. Review the terrestrial biomes listed on pages 163-169.
8. What is the difference between a coral reef and a kelp forest?
9. What is an estuary? Provide one way humans are altering them.

**Ch. 7: Environmental Systems & Ecosystem Ecology**

1. Explain how positive and negative feedback loops affect systems.
2. What is eutrophication and what nutrients often contribute to it? What affect does it have on aquatic ecosystems?
3. Explain the difference between gross and net primary productivity.
4. Explain the paths of carbon, nitrogen, water, sulfur and phosphorus as they are cycled through the lithosphere, atmosphere, and hydrosphere. How have humans altered these cycles?
5. Review the rock cycle.
6. What are the 2 types of tectonic plates?
7. What are the 3 types of plate boundaries?
8. For each boundary, what type of topographic surfaces are created?
9. Explain the 3 types of convergent plate boundaries.

**Ch. 8: Human Population Growth**

1. What factors contributed to rapid human population growth in the 1800s?
2. How is global population rate calculated? National?
3. How do you calculate the doubling time of a population?
4. Contrast developing countries with developed countries.
5. Describe how size, density and distribution, age structure, and sex ratios affect communities and environments.
6. How might TFR and replacement fertility differ between developing and developed countries?
7. Describe the 4 stages of the demographic transition.
8. List some policies and examples of family planning programs that some countries have used to try and control population growth.

**Ch. 11: Biodiversity**

1. Explain the difference between species richness and species eveness.
2. Explain the latitudinal gradient.
3. What is the difference between threatened and endangered species? What about extinction and extirpation?
4. What are the 5 major causes of biodiversity loss?
5. Biodiversity is important to humans because it provides ecosystem services. What are these? List some examples.
6. What are some current methods being used to try and conserve endangered species?
7. Know ESA, CITES, and be familiar with a few non-governmental organizations (WWF).
8. Be familiar with some invasive species (kudzo, zebra mussels, cane toads) and endangered species (think about your project) in case you are asked to give an example of one on the APES exam.

**Ch. 13: Urbanization**

1. Define the term urbanization.
2. What is the difference between rural and urban areas?
3. Explain the differences in migration patterns people in developing and developed nations.
4. What are examples of infrastructures?
5. What are some negative impacts caused by urban sprawl?
6. Why do people want to leave urban areas?
7. Explain why smart growth is considered to be a sustainable practice?
8. What is new urbanism?
9. How does urban decay or urban blight exhibit positive feedback behavior?
10. Why do we need to protect farm land?
11. What is a solution to housing problems associated with an increase in population growth within cities?

**Ch. 16, 17 & 18 Oceanic and Atmospheric Patterns**

1. What is a convection cell?
2. What is the Coriolis Effect?
3. What is an ocean gyre?
4. How can the Gulf Stream be altered and how what kind of environmental impact would it have?
5. What is ENSO?
6. What role do the trade winds play in the ENSO?
7. How is La Nina different from ENSO?
8. What are the layers of the atmosphere?
9. **Directions**: Use colored pencils to draw the following items.
10. *Draw the Hadley, Polar, and Ferrel cells on the right side of the diagram in the correct latitude zones. Label them.*
11. *List where highs and lows would be located at each latitude line. Remember, highs occur where air sinks and lows occur where air rises.*
12. *Draw the weather conditions associated with highs and low on the right by the convection cells.*
13. *Finally, draw in the three major winds: trade winds, westerlies, and polar easterlies. Show the Coriolis Effect’s deflection. Label them.*

