

**GEO 390  
EXAM 3  
SPRING 2006**

**STUDY GUIDE**

Exam 1 covers chapters 14, 15, and 17 in *The Earth System* by Kump et al. Also the ACIA report, the JISAO report, the IPCC report, and the Kyoto Protocol.

Generally questions will focus on material presented in class and the review questions and key terms at the end of each chapter.

**Specifically**

**Chapter 14 Pleistocene Glaciations**

- Key terms: omit methane sulfonic acid.
- Know time period over which the Pleistocene occurs.
- List geologic evidence of past glaciation.
- Understand how climate history is recorded in ocean sediments.
- Understand the Milankovitch Theory for ice age cycles including obliquity, eccentricity, and precession.
- Which orbital parameter appears to drive glacial cycles and what feedback mechanisms may enhance the initial forcing?

**Chapter 15 Short-term Climate Variability**

- Key terms: dendrochronology, palynology, southern oscillation index, stochastic resonance, uniformitarianism.
- Understand difference between weather and climate.
- List climate parameters and methods for measuring them.
- Describe the timing of the last glacial maximum, the Bolling-Allerod, the Younger-Dryas, and the Holocene.
- Describe the role of the thermohaline circulation in the glacial-interglacial transition.
- Know when the Climatic Optimum, the Medieval Warm Period, and the Little Ice Age occurred, how large the temperature changes were, and the impacts on societies.
- Understand the role of volcanoes and sunspot cycles for Holocene climate.
- Describe ENSO cycles (El Niño/La Niña) including wind, ocean current, precipitation changes, and regional impacts.

**Kyoto Protocol**

- When did the Kyoto Protocol enter into force and what is the ghg emission reduction target?
- List the 3 mechanisms by which developed countries may acquire emission reduction credits other than by directly reducing emissions?
- What are the roles of developed, EIT, and developing countries under the Kyoto Protocol?
- What were the ratification requirements for entry into force?
- What is the United States position regarding the Kyoto Protocol.

**IPCC Summary for Policy Makers**

- What is the average global temperature increase since 1860?
- What is the range for predicted temperature change in 2100?
- List expected impacts of continued warming.

**Arctic Climate Impact Assessment**

- What is the annual average temperature increase in the Arctic over the last 100 years and how does it compare to the global average?
- Why is the Arctic warming faster than the global average? List evidence for Arctic warming.
- Why is Arctic warming important globally? What are the regional impacts of Arctic warming?

**Joint Institute for Atmosphere and Ocean: Northwest Climate Impacts**

- How much has the Northwest warmed over the last 100 years?
- What are the projected impacts to the Northwest from continued warming? Include temperature, precipitation/snow, stream flow, salmon, forests, coastal areas.

**Chapter 17**

- When and where was stratospheric ozone depletion discovered?
- Where is stratospheric ozone depletion occurring today?
- Understand the physical and chemical processes that contribute to ozone depletion: temperature, PSCs, polar vortex, sunlight, CFC and catalytic ozone destruction.