

Lock Haven University
GEOS 120 - Oceanography
Study guide for test #3

The format of the test is going to be the same as in the last test. There will be 20 multiple choice questions, 10 definitions (4 points each) and 4 short answer questions (10 points each).

Know the following terms:

Chemical oceanography, hydrogen bond, dipolar nature of water, heat capacity, cations, anions, nutrients, surface tension, depth profile, spring bloom, fall bloom, salinity, thermocline, pycnocline, halocline, sound channel zone, plankton, nekton, mid-water ecosystem, rule of constancy of composition, salinity, conservative vs. non-conservative properties of chemicals, buffering capacity of oceans, photosynthesis- respiration, Sigma temperature, biological oceanography, habitat, pelagic, benthic, hadal, hydrothermal vent community, ecosystem, reef ecosystem, salt marsh ecosystem, biogeochemical cycling, prokaryotes, eukaryotes, taxonomy, phyla, mobility, mode of nutrition, trophic levels, food chain vs. food web, chemosynthesis, energy flow in ecosystems, EEZ, LOS.

Chemical oceanography:

- ❖ -know the unique thermal and chemical properties of seawater (handout).
- ❖ -understand the hydrogen bond and dipolar character of water, i.e. what are they and how do they impact water properties?
- ❖ -know sources and sinks of major ions and nutrients of seawater in light of crust-ocean-atmospheric interactions (handout).
- ❖ -what is the difference between conservative vs non-conservative (nutrient type) properties; know examples of each property.
- ❖ -why do seawaters demonstrate constancy of composition?
- ❖ -thermocline, halocline, and pycnocline - what are they and how are they related to each other? Why are these important to know?
- ❖ -define residence time, steady state, diffusion, mechanical mixing, etc.
- ❖ -understand the processes responsible for the patterns of the depth profiles of temperature, salinity, nitrate, phosphate, silica, dissolved oxygen, and carbon dioxide in seawater (handout).
- ❖ -carbon dioxide reserve of ocean - know the buffering capacity of ocean water (you can consult lab exercise #14, which we didn't do in the lab)
- ❖ -Know the seasonal variations in nutrients and the role they play in biodiversity and mproductivity.

❖ **Biological oceanography:**

- ❖ -why aren't there great biodiversity in ocean?
- ❖ -know that there are way more benthic organisms than pelagic ones. Also, understand the reason why it is so.
- ❖ -know the major marine environments (various pelagic vs benthic environments).

- ❖ -know the major kingdoms and phyla, as well as examples and importance of these organisms (e.g. protista causes red tides; metaphyta = different macroscopic and microscopic algae= basis of food web).
- ❖ -understand the concept of energy transfer (you can consult the lab #16, we didn't do this lab), food web, trophic levels of marine organisms.
- ❖ -know organisms by their role in food pyramid: primary producers, consumers (herbivores, carnivores), scavengers in a food web and trophic levels.
- ❖ -know the taxonomy (at least the major phyla and the organisms that represent those phyla)
- ❖ -know examples of organisms by food habit (suspension feeders, sediment feeders, etc.)
- ❖ -know organisms by habitat: pelagic, benthic, epifauna, infauna, etc.
- ❖ -know organisms by mobility: plankton, nekton, sessile, motile, etc.
- ❖ -know major animals of pelagic environments (fish, jelly fish, squids, mammals, and their adaptation to environments)
- ❖ -know the major animals of benthic (98% of marine organisms are benthic) environments: (mollusca = most common in coastal zones (5 types = gastrpoda, cephalopoda, pelecypoda, bivalvia, chitons); sea anemone, sea star, crabs,
- ❖ know coral reef ecosystem = tremendous diversity; organisms in hydrothermal vents and hypersaline seeps = tube worms, white crabs, bacteria (symbionts), giant clams, worms, shrimps, etc; organisms near hydrocarbon seeps, etc.
- ❖ -know the technology and equipment used to reach or study the benthic environments
- ❖ -Know the Laws of Sea (LOS) and EEZ concepts; major marine resources (metallic, non-metallic, energy, water, etc.) & pollution and issues of environmental concerns .