

Exam 1 Study Guide: Marine Biology

- *Read the chapters in the book and the supplemental reader (the one that describes habitats in Monterey Bay)*
- *Read your notes (my exams draw heavily from notes)*
- *Don't stress, and don't cram (it doesn't work very well)*

History and exploration of the ocean:

- What were the driving forces behind early exploration? (eg. very early, historical and modern exploration– navigation vrs. Scientific discovery vrs. Resources (fish etc.) vrs. Conquering etc.
- What were some trends in ocean technology (early to present) eg. what did people use in the early days and what is available today?

Scientific method: be able to describe the scientific method, and what it means to be a critical thinker.

Geography and Geology:

- What are the major oceans, and their locations
- Plate tectonics:
- Know about subduction and spreading zones. Know about mid ocean ridges (ridges) and what forms them (seafloor spreading). Know what causes subduction (heavy oceanic and lighter continental plates collide)
- What happens to plate material after it subducts or as it comes out of spreading zones? (it either heats up and comes up through volcanoes or comes out of spreading zones as new material on the ocean floor)
- Classification of general ocean habitats: continental shelf, continental slope, continental rise and abyssal plain.
- Active vrs. Passive margins (eg. East coast vrs. West coast)
- Pelagic realm (offshore), coastal (nearshore) intertidal realm (between the tides)
- Photic zone (zone with sunlight)

Physical and chemical oceanography:

- Know what makes water special
- Know about the density of different states of water (eg, that it gets denser as it gets colder but floats as ice)
- Know that water holds together by polar bonding
- Know about salinity: causes, distribution in the ocean, and that salty water is dense and heavy
- Know what a thermocline is
- Know about gases dissolving in water (eg that they dissolve better in cold water)
- Know the behavior of oxygen (amount dissolved) as you go deeper
- Know what causes the oxygen minimum layer
- Know about temperature/density relationships (eg. salty cold water sinks)
- Where does deep ocean circulation originate (Poles, especially North Atlantic)?
- What causes it? (cold dense water – salty too makes it dense)
- Know what causes waves
- Know the major surface currents of the ocean (and that they flow in clockwise or counterclockwise motion in N and S hemisphere due to the coriolis effect)
- Know what eastern and western boundary currents are, where they are found, and major differences between the two.
- Know the name of the major current along our coast!

- Know where in the oceans productivity is highest (high primary productivity) and where the productivity is low
- Know what a gyre is and what characterizes them
- Know what happens to light and sound in water compared to air
- Know what happens to color in water
- Know what happens to pressure as you go deeper, and how that affects some organisms
- Be able to describe El Nino, what causes it, and what some of the major effects are.

Biology/Ecology:

- Know what traits all living things share in common (what makes something 'alive')
- Be able to describe abiotic and biotic factors that affect marine communities
- Be able to describe some communities in Monterey Bay (we've looked at sandy beach and float communities so far) and list factors (biotic and abiotic) that affect them
- Be able to explain reproduction (sexual and asexual), and list pros and cons of each
- Understand osmoregulation (regulating saltiness) and thermoregulation (regulating temperature). Know what isosmotic, hyperosmotic and hypoosmotic are.
- Know endothermy, ectothermy and counter current heat exchangers
- Know what benthic, sessile, filter feeder, pelagic, and planktonic mean
- Know what autotrophs and heterotrophs are
- Know what a primary producer (autotroph), a primary consumer, secondary consumer and tertiary consumer are (see book for clarification)
- Know what photosynthesis is, and what it produces
- Know what a hermaphrodite is
- Know what broadcast spawning is, and other reproductive strategies (nesting/brooding, internal fertilization and live young etc.)
- Know the main differences between prokaryotic (smaller and simpler such as bacteria) and Eukaryotic (larger and more complex, capable of meiosis – sexual reproduction) cells
- Know the basics of classification (KPCOFGS) and the correct order of the classification groups.
- Resource partitioning
- Competitive exclusion
- Keystone species
- Biomagnification
- K and r selected species
- Speciation
- adaptation

Algae:

- 4 major divisions (also known as phyla) (including the sea grasses), and major characteristics, including where they might live. Focus on rhodophyta, phaeophyta, and chlorophyta
- Major characteristics (eg. holdfast, stipe, thallus, blade, pneumatocyst)
- Differences in pigment utilization
- Human uses of algae
- General structure of a kelp bed (turf, understory and canopy)