

EOSC 105L STUDY GUIDE (2 pages): LAB EXAM 3 (FINAL) Mon. 12/9 & Tues. 12/10, 2019

REVIEW:

1) ppt lab lectures on blackboard, 2) lab exercises, 3) topo map exercise in the lab manual, 4) your notes and field trip notes

MAP SKILLS (Geologic and Topo. maps): both geologic maps (La Jolla and La Mesa) used in lab are on reserve in the library, (2 hr. check-out). Topo maps (Sweeney Pass and La Jolla) used in lab are on Bb.

- Review topographic map reading skills: bar scale, ratio scale, latitude and longitude (reading and writing), interpretation of contour lines, recognize: valleys, ridges, stream flow direction, and possible hazards based on interpretation of features such as faults (HW vs FW; dip slip vs strike slip), valleys, steep cliffs, etc.
- Be able to recognize resistant versus nonresistant rocks on a topographic map (contour lines) and geologic maps (legend description).
- Be able to express the trend of features on a map. For example, the Rose Canyon Fault trends NW-SE
- Be able to interpret geologic information on maps by using the legend description.
- Understand how to read and interpret profiles/cross sections at the bottom of maps.
- Be able to calculate gradient.
 - <http://serc.carleton.edu/mathyouneed/slope/index.html>
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HAZARD MAPS:

- Understand liquefaction and how it leads to ground failure. In general, where is liquefaction a hazard in SD? (think about the geology of location—see below).
- Why should you remember: 1) Ardath Shale 2) Qal 3) Qaf 4) Qls; Q stands for recent or old?
- Remember the difference between the following: 1) Qal, 2) Sandstone, 3) Conglomerate, 4) Shale (clay), and 5) Granite. Think about rock type? Susceptibility to liquefaction and/or prone to landslides?
- **Hazards maps used in lab:**

<https://www.sandiego.gov/sites/default/files/geo29.pdf>

<https://www.sandiego.gov/sites/default/files/geo16.pdf>

<https://www.sandiego.gov/sites/default/files/geo17.pdf>

<https://www.sandiego.gov/sites/default/files/geo20.pdf>

WEEKEND FIELD TRIP ON 11/9: see pre-field ppt lecture and your field handout notes

You can use your field trip handout for only the field trip questions, will turn in after exam!

- Understand the tectonic history of Southern California: be familiar with the sequence of tectonic/geologic events leading up to the formation of the San Andreas Fault and other strike slip faults in the region.
 - Why did subduction stop? Why is there an eastern and a western PRB? What is the difference? How did each form? What is a batholith? What is an arc (continental arc vs island arc)? Evidence today to support subduction stage?
 - Know the approximate age of the batholith, and geologic time (approximate) for the different tectonic stages: Subduction: ~ 140-30Ma; Extension: ~ 30Ma-now (rifting of Baja today), and Strike Slip or Transform: ~ 10Ma-today.
 - How does the “poway clast” fit into the geologic history? Composition of clast? Location of clasts today?
 - Why did extension (tension) develop after subduction? Geologic evidence to support extension did occur?
- Be able to list the natural hazards likely to occur in the San Diego region and where (geographic location).
- Know 4 major faults in S. CA.: Rose Canyon Fault and the 3 major faults to the east. Where are these faults in relation to the PRB (Peninsular Ranges Batholith)? Can you place the above on a map or cross-section view?
- Understand liquefaction and how it leads to ground failure. In general, where is liquefaction a hazard in SD? Think about the geology of location: Qal, river sediment, coastal sediment, artificial fill (Qaf)
- What type of landslide in Tecolote canyon? Be ready for any questions about discussion at this stop.
- Be familiar with the figures in your field trip handout

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CLIMATE LAB: Be able to discuss the connection between change in surface albedo, change in radiation budget, change in CO₂ levels, glacier distribution, and sea level change.

Earth's radiation (energy) budget:

- Albedo: how was albedo calculated? Units used to express albedo?
- How do surface properties affect albedo? 1) color (light vs dark); 2) wet vs dry
- Understand the radiation budget: % absorbed by Earth, % absorbed by atmosphere; % reflected from Earth and atmosphere. What is Insolation? short or long wavelength?
- Understand greenhouse effect, can you explain using the radiation budget?
 - Energy emitted from Earth, short or long wavelength? _____ radiation.
- Connection between albedo and climate change?

Plotting CO₂:

- What was the purpose of this exercise?
- **Look up** the Keeling curve: what does this show? https://scripps.ucsd.edu/programs/keelingcurve/wp-content/plugins/sio-blueluon/graphs/co2_800k_zoom.png
- **Look for** a graph showing CO₂ content since 1700 (includes industrial revolution). How does it "look" compared to the Keeling curve? https://scripps.ucsd.edu/programs/keelingcurve/wp-content/plugins/sio-blueluon/graphs/co2_800k.png
- **Look for** a graph showing CO₂ content for the last 800,000 yr. How does it "look" compared to the Keeling curve? https://scripps.ucsd.edu/programs/keelingcurve/wp-content/plugins/sio-blueluon/graphs/co2_800k.png
- **Review this 2013 article:** <http://www.climatecentral.org/news/the-last-time-co2-was-this-high-humans-didnt-exist-15938>
- How do scientists learn about historical CO₂ levels?
- CO₂ level today? _____ppm

Sea level Rise/Glacier Melt:

- Purpose of this exercise?
- Last continental ice sheets on Earth? What is an alpine glacier?
- There might be some calculations for this section, formulas will be given.

TROPICAL CYCLONES AND WEATHER MAPS: See ppt lecture and reader pages

- **Be able to interpret (read and draw) a weather map and be familiar with terms:** fronts (symbols for warm and cold fronts); high and low pressure: conditions and circulation of wind; predicting storm movement (air mass movement associated with fronts); isobar interpretation (strong vs weak wind; low vs high pressure); pressure gradient (what does this mean?); millibar (mb); deflection of wind due to Coriolis.
- What is wind?
- What is the difference between a cold front and a warm front? Know how to interpret each on a weather map.
 - On which side of each front are the cold and warm air masses?
- Understand how the trades and the westerly winds affect tropical cyclone migration in the northern and southern hemispheres.
- When a tropical cyclone makes landfall: which side of the storm is the worst in terms of wind and storm surge? Why? consider northern and southern hemisphere.
- Saffir Simpson Hurricane scale: how many categories?

ANY CHANGES WILL BE ANNOUNCED THROUGH BLACKBOARD/EMAIL