Semester-Long Research Project

Students may replace their lowest exam score by completing the following project.
Due Date*: Last regular class meeting before final exam *(at beginning of class)*
**Projects may be turned in early, but will not be accepted late.

Assignment (Choose one of the following):
Marine Organisms *Pick a particular marine organism (such as a seastar, salmon, or stromatolites). Describe its ecological niche in the oceans – its special traits that make it competitive, and anything else scientifically interesting about it and its role in the oceans.*
Oceanography -- Pollution or Fishing Industry *Pick a particular type of pollution, pollution location, or fishing/commercial industry in the ocean (plastics, radioactive waste, offshore oil, Bluefin Tuna, Shrimp Farming). Describe its story – how humans are impacting global oceanic systems and how the ocean is responding.*

Assignment structure:

- Review the questions that follow this description (specific to the two different themes above). These questions relate your topic to the content covered each week in the class. Research answers weekly. Be sure that you answer all these questions in your project.
- Sources of your research should include at least one peer-reviewed science journal or lab website (for real data)**.** Keep track of sources and record in a bibliography AS WELL as citing when used IN your narrative.
  - **Example bibliography citation:**
    - NOAA Tsunami - The Tsunami Story. Accessed December 12, 2015. http://www.tsunami.noaa.gov/tsunami_story.html.
    - Levin, Lisa A and Le Bris, Nadine, The deep ocean under climate change, Science, 350, 766-768, 2015.
    - K. M. Gjerde, D. Currie, K. Wowk, K. Sack, Mar. Pollut. Bull. 74, 540–551 (2013).
  - Example in-text citations:
    - Paraphased text that uses facts from a source: Average temperatures in the deep ocean basins of the world's oceans have increased up to 0.1°C per decade (Gjerde et. al, 2013).
    - Quote: "Few long-term hydrographic or biodiversity data series exist for the deep ocean on climate-relevant time scales (typically several decades)." (Levin and Le Bris, 2015).
- Create a short creative project that communicates what you've learned. Examples: children's story book, art piece, poem, short story, written science summary, blog piece, PPT slides, game, etc. (Review online samples of previous assignments.)
- Your final product to be handed in needs to be in a format that can be accessed online – so it needs to be an electronic file or printed paper that can be scanned. (Depending on your project, you might need to take photographs and then describe what you did.) Be sure that any images you use are properly cited.
- The length of your project depends on you (it should be guided by thoroughly answering the questions outlined in the following pages), but it should take me no more than 7 minutes to review/read it.
- I prefer that you turn in your project in electronic form (on a CD or thumb drive that I will return to you). You can also e-mail it to me, if it's under 5 Mb.
- Each assignment has to be submitted with a cover page and grading rubric (see attached) AND detailed answers to the questions provided.
- REQUIREMENT – your submission must be your OWN work, whether in words or images. *(If it is discovered that you are using other people's words or images or work without giving them credit, you will not only get a O for this assignment, but a letter of reprimand in your student file. Since this project is NOT required (but is simply available to replace your lowest exam score) bypass the entire assignment before cheapening your integrity.)*
- Assignment should drill down into the details and specifics of your topic, rather than a general overview.
- Assignment should include scientific understanding and research beyond what's available in the textbook, videos, or workbook. Start with the minimum answers to the questions, then explore deeper.
- Try to add data – citing sources and explaining what it means.
- Cite all sources properly and consistently. (For example, ALL images must be cited underneath). Find instructions online: http://content.easybib.com/citation-guides

SEMESTER-LONG RESEARCH PROJECT

Student Name:_____

If your project is chosen to be put online, do you give permission to do so? (Circle: Yes / No)
If your project is chosen to be put online, do you give permission to use your name? (Circle: Yes / No)

Signature and date (if answers are YES):_____

Date received: _____

Description of assignment (so that if it is lost from cover page or can't be attached, I know whose it is!). **Also include here any explanation required for me to grade your work:**
ALSO INCLUDE ALL REFERENCES (unless cited in your work).

MASTER GRADING RUBRIC

Student name:		
Grading area	**Grade**	**Grade**
Thoroughness & Depth	4 pts if ALL questions were addressed thoroughly (that means a deep explanation). 2 pts if 50- 95% of questions were addressed or are incomplete or superficial 0 pts if 50% or fewer of the questions were addressed	
	Introduction week	
	Water Planet week	
	Plate Tectonics week	
	Seafloor/Sediments week	
	Seawater Chemistry and Physical Properties weeks	
	Atmosphere week	
	Currents week	
	Waves week	
	Tides week	
	Coastlines week	
	Marine Organisms weeks	
	Pollution/Human Interaction weeks	
Accuracy	4 pts if content is accurate, supported by studies, and with good data and interpretation. 2 pts if there are inaccuracies or a lack of support 0 pts if there is no real scientific content or it is mostly inaccurate and unsupported.	
References	4 pts if references are provided, robust, include scientific studies, and all work and graphics are correctly cited (at end and in text where relevant) 2 pts if all references/citations are weak or not correctly attributed or limited 0 pts if references are missing or if no new information was researched and provided	
Communication	4 pts if the project clearly communicates a message 2 pts if some of the project's message is difficult to understand 0 pts if it is difficult to understand any of the message of the project	
Enjoyment factor/creativity	4 pts if the project energizes the audience and engages them, pulls them in 2 pts if the project is moderately engaging/creative 0 pts if the project is not engaging at all	
	TOTAL (20 points possible)	

Comments?

Semester Marine Organism Report

Week 1 Introduction:
Favorite marine organism in the oceans (want to study it through the semester): and why?

Water Planet:
- What kind of creature is your organism (heterotroph or autotroph)?
- How long ago did this creature evolve?
- In what oceans is this organism primarily found?

Plate Tectonics:
Is this organism affected at all by features produced through plate tectonics? If so, how?

Seafloor/Sediments:
- What depths and underwater features do these organisms live around?
- Does this organism interact with seafloor sediments at all? If so, which kind?

Seawater
- What type of water clarity does this organism require?
- Pressure it can withstand?
- Temperatures?
- Salinity?
- pH of the water?

Atmosphere
- Is this organism affected at all by atmospheric conditions? If so, how?
- Seasonal variations?

Currents:
What is the relationship of this organism to ocean currents? Used for food? Movement?

Waves:
What are the wave conditions this organism can withstand? Prefers?

Tides:
How is this organism affected by tides (if at all)? Feeding? Migration? Survival?

Coasts:
What types of coasts does this organism live near or by? (or does it live far away from land?)

Marine organisms
- What is the complete taxonomic classification for this organism? (Kingdom, Phylum, Subphylum, etc.)
- What is its scientific name?
- What are some other organisms within its same classification (thus closely related)?
- What is its location classification (nekton, benthos, etc.)?
- What is its relationship to ocean viscosity? (Prefers it low or high? Why?)
- What does it feed on and how?
- What are its predators?
- What are some special traits it has developed to be successful in its niche?
- How does it reproduce?

Pollution/Human Interaction
How is this organism affected by humans (positively and/or negatively)?

Semester Fishing Industry/Marine Pollution Report

Week 1 Introduction:
Why pick this particular fishing industry or pollution type or location?

Water Planet:
a. Latitude and Longitude:
b. Ocean(s):
c. Depth:
- Plate Tectonics:

d. Plate tectonics setting:
e. Tectonic processes expected there (influences) -- causes and/or effects?

Seafloor/Sediments:
- Seafloor bathymetric location (nearby features) – causes and/or effects?
- Sediment types (composition and sizes) associated causes and/or effects?

Seawater
What are the impacts on/by/or to:
- Clarity of the water
- Pressure of the water
- Temperature of water
- Salinity of the water
- pH of the water
- Presence of pycnocline?
- If a pollutant – what it is, what's it chemistry? How does it interact with surroundings? Why is it bad?

Atmosphere -- impacts on/by/to:
- Atmospheric conditions
- Seasonal variations?

Currents -- impacts on/by/to:
- Local Currents
- Larger Scale Currents

Waves -- impacts on/by/to: Wind waves and tsunami

Tides -- impacts on/by/to.

Coasts -- impacts on/by/to:
- Coastal processes (erosional vs depositional)
- Major sources or sand
- Major sinks of sand
- Longshore current

Marine organisms
- Pollution or fishery impacts on/by/to different types of marine environments
- Interactions with other marine organisms.
- (If a fishery, be sure to describe the full life cycle – migrations, nurseries, feeding methods and prey, etc.)

Pollution/Human Interaction
- How are humans impacting this fishery or pollution type/location? Both the positives and the negatives…
- What does the future look like?
- What can we do for sustainability or remediation?