

GEL 298

Coastal Ecogeomorphology

Fall 2020

Nicholas Pinter and John Largier

Tuesdays and Thursdays, 5:00p – 7:30p for 3 weeks (see calendar), via Zoom

Because this class runs during the first half of the quarter, we are asking you to start working on your class presentations before the quarter begins. Please read this carefully to the end, and **contact us by email** to propose a paper you would like to summarize, if we have not already listed one for you. Then we will assign a “discussion leader” to your paper.

Course Outline

Goals and Objectives: The course will 1) familiarize student participants with the geology, oceanography, coastal dynamics, and ecology of Baja California and the Sea of Cortez; 2) encourage students to become class “experts” in one or more critical aspects of the study area.

The Gulf of California is marginal sea that opened when the Baja California Peninsula was rifted off the western Mexican mainland at about 6 Ma. The Baja California margin of the Gulf of California is far more rugged than the mainland Mexico side, with far more islands adjacent to it, and is still tectonically active. This, together with excellent desert exposures, make it an ideal natural laboratory for studying continental rifting and associated volcanic activity. The Gulf of California is also a richly productive marine system, thanks to upwelling and tidal mixing of deep nutrient-rich water from the Pacific into the warm stratified Gulf waters. This supports abundant fish, shrimp, sharks, sea lion and sea elephants, sea turtles, rays, and a wide variety of types of whales, as well as intertidal to shallow subtidal benthic marine invertebrates.

Grading Criteria:

Grading will be via a letter grade. However, each student has the option of reinstating the original grading mode in the following way: by the usual P/NP (or S/U) deadline (the 25th day of instruction), the student must take a copy of the syllabus to the Office of the Registrar and file a 'Grading Variance Exception' petition.”

For students taking class for (2) credits:

Class attendance and participation: 35%

30-minute class presentation: 50%

Discussion leadership: 15%

For students taking class for (3) credits:

Class attendance and participation: 25%

30-minute class presentation: 30%

Discussion leadership: 10%

Research paper: 35%

Requirements:

(1) Class attendance: Students are required to attend classes, and the expectation is that all students will attend all six class sessions. However, one absence will be excused without consultation needed; any additional absence will result in 1 full grade reduction for the class. *As a reminder, if a student misses a class, it is solely his or her responsibility to find out what was discussed.*

(2) Class presentations: Two student presentations will be given at each of the last four class meeting class meetings (classes 3, 4, 5 and 6, see schedule below). In each of these classes, a main student presenter will give a **30-minute Powerpoint lecture on one important aspect of the geology, coastal oceanography or ecology of the Gulf of California and/or Baja California Sur**. The student presenter is expected to become an expert in this topic, based on at least 8-10 peer-reviewed journal articles (non-web sources), and bring that expert knowledge to his or her lecture.

The selection of topics and coordination of the effort will require communication and cooperation with other students. Each presentation will address either:

(A) The geologic history of Baja California and the Gulf of California. This includes the regional plate-tectonic setting of the western Mexico margin, as well as the structural, sedimentary and volcanic evolution of the Gulf of California. On all of these topics we will look for connections between the geology, oceanography and ecology of the region, and associated conservation challenges.

(B) The nature and dynamics of Baja California and the Gulf of California marine/coastal ecosystem(s). This could include global change (broadly defined to include various changing abiotic or anthropogenic influences), or evolutionary change. We also encourage examinations of past and future efforts to improve ecosystem functions.

Exactly one week before each student lecture, the presenter will provide one journal article for the class to read. These articles may NOT be longer than 10 pages, and preferably shorter. Article should be of broad interest to an interdisciplinary scientific audience.

After each presentation, one other student will lead a 10-minute discussion of the assigned article, and how it connects with or highlights the student presentation. Discussion leaders will bring a list of talking points or questions. Discussion leaders will also assign participation points to the remaining students in the class (1-5 points) based on their knowledge of the assigned paper and based on their participation in the discussion.

(4) For students taking the 3-credit option: Class presentations: Students will prepare a 10-page research paper, including at least 5 paged of single-spaced text, on the topic presented in class. This paper is due on Nov. 13th, no exceptions. The topic of the paper should generally be the same as a student's presentation, unless discussed and approved by the instructor in advance. All papers should have a central focus on Baja California Sur and/or Sea of Cortez. Papers should fully review primary sources from the scholarly literature and may, in some case, include original data or analyses. In all cases, papers should be scholarly, consistent with a graduate-level seminar in a science department, drawing upon the research literature on that topic. To avoid plagiarism, all information and figures from the literature must include citation(s) and be in your own words; however, a few short quotes are allowed if quotation marks are used. A term-paper grading rubric will be provided

COURSE SCHEDULE

The class will meet Thursdays and Tuesdays from 5-7:30pm, as indicated below

Tuesday, Sept. 29:

Student introductions, outline of general topics, initial assignments.

Cathy Busby: Introduction to geology of Baja California

John Largier: Introduction to oceanography and nearshore processes

Thursday, Oct. 1:

Ted Grosholz: Introduction to coastal ecology of Baja California

Nicholas Pinter: Introduction to coastal geomorphology

Student Presentations

Tuesday, October 6

Ecological impacts of marine nutrients on terrestrial ecosystems of Baja California

1. Main presenter – Brian Williamson

Discussion leader – Kennedy

The effects of mangrove loss on ecosystem services and coastal morphology in the Gulf of California

2 - Main presenter: Daniel Kozar

Discussion leader: Kramer

Thursday, October 8

Effects of Colorado River Dams on the Northern Gulf of California

1. Main presenter – Will Speiser

Discussion leader – Korabik

Carbonate chemistry: Ecological significance in the Gulf of California

2 -Main presenter: Alisha Saley

Discussion leader: Gonzalez

Estancias Sumergidas: On artist Cristina Iglesias' trans-scientific collaboration in the Sea of Cortez

3. Presenter – Tarik Elhaik

Tuesday, October 13

Management and Conservation of Baja Fisheries

1. Main presenter: Dylan Stompe

Discussion leader Speiser

Tectonics and tectonic history of the Gulf of California

2. Main presenter: Dan Kramer

Discussion leader: Williamson

Macroalgae communities and their ecological role in Baja California

3. Main presenter: Angela Korabik

Discussion leader: Saley

Thursday, October 15

Ocean cycles and responses in the Gulf of California

1. Main presenter – Esther Kennedy

Secondary presenters – Stompe

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2. Main presenter – Julie Gonzalez

Discussion leader – Kozar

Example topics (these were covered in the previous class and can be covered again – or you can suggest other topics; there are many more possibilities):

- Geology and volcanic rocks of Baja California Sur, e.g., Drake, W.R., Umhoefer, P.J., Griffiths, A., Vlad, A., Peters, L., and McIntosh, W. 2017, Tectono-stratigraphic evolution of the Comondu Group from Bahia de La Paz to Loreto, Baja California Sur, Mexico: *Tectonophysics*, 719-720, 107-134
 - Tectonics and tectonic history of the Gulf of California), e.g., Umhoefer, P.J., 2011. Why did the Southern Gulf of California rupture so rapidly? —Oblique divergence across hot, weak lithosphere along a tectonically active margin. *GSA Today* 21 (11):4–10. <http://dx.doi.org/10.1130/G133A.1>
 - Uplifted coastal terraces of Baja California, e.g., DeDiego-Forbis, et al., 2004. Late Pleistocene (Last Interglacial) terrace deposits, Bahia Coyote, Baja California Sur, México. *Quaternary International* 120 (2004) 29–40
 - Projected climate change impacts on marine life in the Gulf of California, e.g., Rosa, R., and B. A. Seibel. 2008. Synergistic effects of climate-related variables suggest future physiological impairment in a top oceanic predator. *Proceed. National Academy of Sciences* 105:20776–20780. <https://doi.org/10.1073/pnas.0806886105>
- Fisheries and conservation in Baja, e.g., Lluch-Cota, et al., 2007. The Gulf of California: Review of ecosystem status and sustainability challenges. *Progress in Oceanography* 73: 1–26.)

Notice of the Code of Academic Conduct: According to the *UC Davis Code of Academic Conduct* (sja.ucdavis.edu/files/cac.pdf), all members of the academic community are responsible for the *academic integrity* of the UC Davis campus.

Presenter: _____

C. Ecogeo Student Presentation Rubric

	<u>Yes</u>	<—————>	<u>No</u>	
Did the presenter lead with a clear main question or issue?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Did the presentation review the background scientific literature?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Was the presentation logically organized and did it flow well?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Did the speaker's volume, enunciation, vocal style, eye contact, and enthusiasm make for an effective and clear presentation? Any suggestions?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Were the presentation graphics clear and effective?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Were the 'big picture' concepts and significant conveyed well?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Was the presentation tailored to the correct audience – in this case, an interdisciplinary graduate-student seminar in the sciences?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Did the presentation last ≥ 25 min. and ≤ 30 min?	<input type="radio"/>			<input type="radio"/>
What did you like best about this presentation?				
If you had to suggest one improvement to this presentation, what would it be?				

Discussion Leader: _____

Discussion Rubric

	<u>Yes</u>	<—————>	<u>No</u>	
Discussion correctly pin-points the most interesting issue(s)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Disc. leader demonstrates a thorough familiarity with the paper	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Leader utilizes a list of interesting or controversial questions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Discussion stays on the subject	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Were the 'big picture' concepts and significant conveyed well?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Leader stimulates discussion when it's slow, and demonstrates adequate restraint when it's going well	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>This was a lively and interesting discussion of the topic</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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RUBRIC FOR FINAL WRITTEN PAPER

Student Name: _____

Topic: _____

Students will prepare a 10-page research paper, including at least 5 pages of single-spaced text, on the topic presented in class. The topic of the paper should generally be the same as a student's presentation, unless discussed and approved by the instructor in advance. Papers should fully review primary sources from the scholarly literature and may, in some case, include original data or analyses. In all cases, papers should be scholarly, consistent with a graduate-level seminar in a science department, drawing upon the research literature on that topic. To avoid plagiarism, all information and figures from the literature must include citation(s) and be in your own words; however, a few short quotes are allowed if quotation marks are used.

Paper Mechanics

	<u>Yes</u>	<----->	<u>No</u>	
Paper correctly focuses on the science of Baja California Sur, the Sea of Cortez and/or relevant issues	5	4.5	3.5	2 0
Paper is well written	10	9	7.5	4 0
Paper is well organized: incl., abstract, background, analysis, conclusions	5	4.5	3.5	2 0
Figures and tables are legible and high in quality	5	4.5	3.5	2 0
Figures and tables are creative and useful to the presentation	5	4.5	3.5	2 0
Paper has 5 pages of text, single-spaced, no monkey business (not counting figures and references), and ~10 pages total	10	9	7.5	4 0
				Total = ____ of 50

Quality of Research

	<u>Yes</u>	<----->	<u>No</u>	
Paper correctly pin-points the most interesting or controversial issue(s)	5	4.5	3.5	2 0
Paper utilizes a wide variety of sources	10	9	7.5	4 0
Paper demonstrates a thorough familiarity with the topic	10	9	7.5	4 0
Paper presents specific and detailed information	10	9	7.5	4 0
Paper includes thoughtful synthesis and conclusions	5	4.5	3.5	2 0
<i>The paper is a thorough and scientific discussion of the theme</i>	10	9	7.5	4 0
				Total = ____ of 50

Total Score = ____ of 100