Instructor: Professor Ashley Larsen (Larsen@bren.ucsb.edu)
Prof. Larsen’s Office hours: Friday 9:00-10:00am (Zoom).

Teaching Assistant: Nakoa Farrant (farrant@bren.ucsb.edu)
Office hours: TBD (Zoom).

Zoom discussions (required): **Monday: 2:00-3:15pm**

The objectives of this course are for you to:
   1. Understand the principles and concepts underlying conservation planning
   2. Understand how these principles are applied in real world settings
   3. Gain exposure to and experience with a range of conservation planning tools

**Course Structure:** For most weeks, there will be one lecture on a key topic in conservation planning and one computer lab exercise using a planning tool that reflects concepts from lecture. We are going to “flip” the classroom to accommodate remote teaching.

**Lectures:** Lectures will explore different topics in conservation planning. Lectures will be pre-recorded for course continuity in the event that the instructor/TA or students become ill. A link to the week’s lecture will be posted on Gauchospace by Thursday at 5:00pm the week before. There will be a series of questions embedded and/or accompanying the lecture. Please view lecture in advance and “bring” your responses and any other questions from lecture to the zoom break-out discussions on Mondays.

**Zoom Discussions:** Discussions will begin with a short student presentation of the readings and a class activity (see details below). Students will then break out into discussion groups to go over the structured lecture questions and any other questions about lecture. Each group will report back at the end of the discussion section.

**Readings:** Required readings accompany each lecture to provide context. All readings will be available on Gauchospace. There will be weekly reading quizzes (True/False). These quizzes will be very short and cover the main points of the readings. Quizzes will be 5 minutes in duration and available on Gauchospace from Friday at 12:00pm the week before until the start of the zoom discussion (Monday at 2:00pm). Please complete the readings before watching lecture.

**Lab and Lab Assignments:** Lab sections are designed to explore commonly used tools in conservation planning. We will pre-record an introduction to the tool. We will also pre-record a short demo of the lab exercise. Students will then use real data to address a short conservation problem by repeating and extending the demo on their own. Students have access to all data and computer programs through Remote Desktop. We will create a Q&A forum on Gauchospace for student discussion of the labs and will hold zoom office hours to facilitate answering questions. However, successfully completing the labs will likely require substantial troubleshooting and googling of issues on your own. As such, analyses will often require at least 2 hours to complete. **All analyses should be completed individually,** though peer-to-peer discussion is encouraged. Written assignments #2-7 will be completed in pairs, with the first author responsible for the rough and final drafts, and the second author responsible for detailed peer-review comments. Pairs will work together for two consecutive assignments such that each individual is a first and second author on one. A template for the written assignment is posted on Gauchospace. A google doc
with the class participants is on Gauchospace. Please coordinate partners amongst yourselves and rotate partners after 2 labs. You are responsible for coordinating with your partner to complete the write-up.

**Project Proposal:** The project proposal is included to encourage deeper exploration of practical conservation planning challenges. A proposal includes scoping of a problem, objectives, proposed data and proposed (and often preliminary) analyses. Proposals can be related to Group Projects or another topic that aligns with the concepts and tools presented in class, and can be completed in pairs or individually. We encourage students to explore topics early in the quarter and discuss with the TA or professor. Two “working labs” will be devoted to project proposals. Additional time outside of class time will be necessary to complete a thorough proposal. Proposal presentations and write-ups will be due week 10. See proposal template on Gauchospace for more details.

**Assignment grading:** See Gauchospace for templates and grading rubrics.

*Assignments are due at 2:00pm on the day listed. Late assignments will lose 1 point if it is not turned in before scheduled lab (2:00pm Wednesdays) and 1 additional point each day that it is late.*

**Attendance & Participation:** Remote learning is sub-ideal and we are striving to avoid suboptimal outcomes. Engagement with the material is critical. Participation will be recorded as thoroughness of responses to lecture prompts and participation in zoom discussions (lecture), and effort troubleshooting and meaningful contributions to the Gauchospace web forum (lab). A Q&A forum is on Gauchospace. Think of it as a 270-specific stackexchange. We will provide an example of “meaningful contribution”. We strongly encourage students both asking and addressing questions in the forum. Participation will be used to adjust final grades up or down. Do not underestimate the importance of consistent, meaningful participation to your learning (or grade) outcomes. Please email the instructor asap (Larsen@bren.ucsb.edu) if you become ill and cannot participate in class fully. Make-up work is available to recover participation points for excused zoom discussion absences.

**Student-led Discussion:** Most weeks (2-8) will include a student-led discussion of the readings. Sign up for a date on Gauchospace. Students leading the discussion should be the experts on the papers assigned. You are welcome to contact the TA or professor (at least 24h in advance) with specific questions. Student-led discussions include 3 components. 1) Students should prepare a short (<10 minute) presentation that summarizes the main points and put the paper in context of the broader literature or conservation issue. The presentation will occur at the start of the Monday zoom meeting. 2) Students should also prepare a short exercise (<10 minutes) to engage the class in the material during the Monday zoom meeting. 3) Students should upload a ~ 1 page summary of the reading to Gauchospace. A grading rubric and more details are posted on Gauchospace.

**Office Hours:** We will have google sheet signups for 15m slots. Slots will be limited to 4 people. Please arrive already connected to the UCSB VPN, already in the software (e.g. in ArcMap), with the error pulled up, as applicable. Connect to zoom meeting from your computer (not the VPN).

**Grading:** Grading is based primarily on lab and project assignments and participation.

- **Weekly Lab Assignments:** 12 points each (1 opinion piece + 6 labs, 84 points total)
- **Student-led paper discussions:** 20 points
- **Reading Quizzes:** 2 points each (12 points total)
- **Project presentation:** 12 points
- **Project proposal:** 12 points
- **Participation:** ~2 points per class, (38 points total)
**Acknowledgements:** ESM 270 was developed by Profs. Frank Davis & Ben Halpern. Former TA, Owen Liu, designed the R lab, which parallels the ArcGIS hotspots lab. The material has also benefited from engaged students in prior classes.

**Consider the syllabus a living document. Lecture topics & schedule are subject to change, particularly as the coronavirus situation evolves**

**Note:** Lecture/Lab schedule reflects in-person instruction. The only mandatory scheduled class time for the remote course is Monday 2-3:15pm for discussion of that week’s lecture material.

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<tr>
<th><strong>Week 1</strong></th>
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<tr>
<td><strong>Monday, March 30 (lecture)</strong></td>
<td>Introduction to Conservation Planning</td>
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<tr>
<td><strong>Wednesday, April 1 (lecture)</strong></td>
<td>Conservation elements and setting conservation objectives</td>
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<tr>
<td><strong>Readings:</strong></td>
<td>Kareiva &amp; Marvier 2012, Soule 2013</td>
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<tr>
<td><strong>Assignment 1 due:</strong></td>
<td>What should conservation objectives be? <em>This assignment should be completed solo.</em></td>
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<th><strong>Week 2</strong></th>
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<tr>
<td><strong>Monday, April 6 (lecture)</strong></td>
<td>Species-level conservation targets (viable populations)</td>
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<td><strong>Readings:</strong></td>
<td>Beissinger and Westphal 1998, Doak et al. 2015</td>
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<td><strong>Wednesday, April 8 (lab)</strong></td>
<td>Species range mapping with Maxent</td>
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<th><strong>Week 3</strong></th>
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<td><strong>Monday, April 13 (lecture)</strong></td>
<td>Multi-species priorities and multi-criteria planning</td>
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<td><strong>Readings:</strong></td>
<td>Myers et al. 2000, Kareiva &amp; Marvier 2007</td>
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<td><strong>Wednesday, April 15 (lab)</strong></td>
<td>Mapping hotspots with ArcGIS (or R)</td>
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<tr>
<td><strong>Assignment 2 due:</strong></td>
<td>Using Maxent to map species ranges</td>
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<th><strong>Week 4</strong></th>
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<td><strong>Monday, April 20 (lecture)</strong></td>
<td>Scaling up (conservation networks and portfolios)</td>
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<td><strong>Readings:</strong></td>
<td>Rodrigues &amp; Gaston 2001, Williams et al. 2004</td>
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<td><strong>Wednesday, April 22 (lab)</strong></td>
<td>Marxan as a planning tool for reserve design</td>
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<td><strong>Assignment 3 due:</strong></td>
<td>Using ArcGIS to map hotspots in the California Current</td>
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<th><strong>Week 5</strong></th>
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<td><strong>Monday, April 27 (lecture)</strong></td>
<td>Conservation in a dynamic world</td>
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<td><strong>Readings:</strong></td>
<td>Pressey et al. 2007, Runge et al. 2014, Littlefield et al. 2017</td>
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Wednesday, April 29 (lab)
Modeling connectivity with Circuitscape
Assignment 4 due: Reserve network design with Marxan

Week 6

Monday, May 4 (lecture)
Restoration, reintroductions and rewilding
Readings: Seddon et al. 2014, Sarrazin & Barbault 1996; Sudding et al. 2015

Wednesday, May 6 (lab)
Hijacking tools for restoration planning
Assignment 5 due: Exploring connectivity between patches

Week 7

Monday, May 11 (lecture)
Social science in conservation planning
Readings: Leslie et al. 2015, Sarkar & Montoya 2011

Wednesday, May 13 (lab)
AHP elicitation
Assignment 6 due: Exploring how to make restoration more strategic

Week 8

Monday, May 18 (lecture)
Ecosystem services

Wednesday, May 20 (LECTURE)
EBM/Comprehensive Planning
15m+ for project brainstorming
Readings: Halpern & Agardy 2013
Assignment 7 due: Eliciting and mapping preferences for conservation priorities

Week 9

Monday May 25 (lecture): Memorial day, no class

Wednesday, May 27 (lab)
Project, working lab
Assignment due: None

Week 10

Monday, June 1 (lab)
Project, working lab

Wednesday, June 3 (lab)
Presentations: project proposal & proposed data/analyses

Friday June 5
Assignment 8 due: Conservation Planning Project Proposal