# Spring 2018 Environmental Systems Seminar Series

## ES 291: Environmental Systems Seminar (CRN 35597)
## ESS 190: Earth System Science Undergraduate Seminar (CRN 31240)

[Version 1-1_Final, updated 2018.06.30]

**Course Objectives and Student Learning Outcomes:** (1) To gain exposure to a range of current science topics in Environmental Systems and Earth System Science from researchers working actively in their field; (2) to have an opportunity to interact with guest speakers, ask questions, and discuss research and career opportunities from experts; and (3) to gain experience critiquing a scientific presentation and writing a concise summary about a presentation in order to improve analytical and communication skills.

**Seminar:** Wednesdays 12:30-1:50 pm, COB (CLSSRM) 113

**Instructors/Faculty Leads:** Josué Medellín-Azuara (jmedellin-azuara@ucmerced.edu) ES 291, Michael Beman (mbeman@ucmerced.edu) ESS 190.

**Graduate Student Leads:** Nicholas Dove and Melissa Thaw

**General Assistance:** Selina Davila-Olivera (sdavilaolivera@ucmerced.edu)

**Office Hours: Josué Medellín-Azuara:** Wednesdays 4:00pm to 5:00pm or by appointment; SEI 214. **Michael Beman**: Wednesdays 4:00 pm to 5:00 pm or by appointment; SE1 234.

**Course Policies & Requirements:**

1. Each public seminar will begin at 12:30. Please arrive on time. Sign in each week on the seminar attendance sheet to get credit. You are required to attend 10 of the 12 seminars.

2. The invited speaker will present a ~45 minute seminar followed by ~15 minutes of questions from the audience. This is your opportunity to ask questions of the speaker and engage in conversation, either for clarification, general discussion about the topic presented, or anything else of interest (e.g., graduate school or career opportunities, perspectives on a subject, etc.). Last block (1:30pm to 1:50 pm) is devoted to discussion with the graduate students (ES 291). Do not worry if you feel that the subject matter was over your head. The objective of the discussion period is to give you a chance to ask questions and learn about a current topic with other students who may also have limited knowledge of the subject. See the attached commentary for guidance on asking questions at seminars.

3. Students are encouraged to meet with speakers before or after the seminar. Interested students should contact the speaker's host to facilitate a meeting.

**Spring 2018 Course Grading for Graduate Students:** As a *Satisfactory/Unsatisfactory* course you would require 75% out of 100% to obtain a *Satisfactory* grade. Your grade is made 50% from attending at least 10 seminars (you get a zero from attendance otherwise). The remaining 50% of your grade comes from post-seminar discussions. For each seminar discussion, 2 graduate students will be assigned to co-lead based considering student research topic preferences or other criteria. A sign in sheet or online survey will be circulated. Each graduate student will be required to lead at least 2 discussions. Assessment of participation includes asking engaging questions, and relevance of the questions and discussions with respect to the objectives of the course.

**Course Grading for Undergraduate Students:** Seminar attendance (50%), seminar report (50%). There will be space provided on CatCourses for students to provide a short summary of the main concepts they have learned during a seminar. Students are expected to write at least three reports. Guidelines for report format will be available on CatCourses.

**Academic Dishonesty Statement:** Each student in this course is expected to abide by the University of California, Merced's Academic Honesty Policy. Any work submitted by a student in this course for academic credit will be the student's own work. Should copying occur, the student who copied work from another student and the student who gave material to be copied will both automatically receive a zero for the assignment.

**Accommodations for Students with Disabilities:** The University of California Merced is committed to ensuring equal academic opportunities and inclusion for students with disabilities based on the principles of independent living, accessible universal design and diversity. I am available to discuss appropriate academic accommodations that may be required for student with disabilities. Students are encouraged to register with Disability Services Center to verify their eligibility for appropriate accommodations.

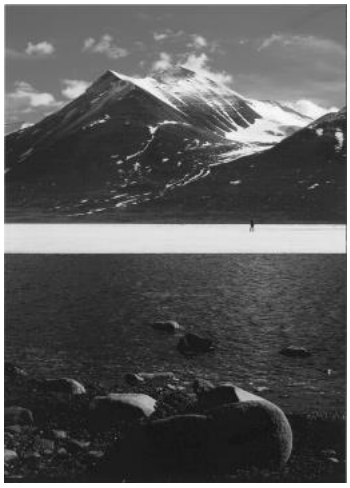
*Thanks to Dr. Marc Beutel, Dr. Emily Moran and Dr. Jeffrey Jenkins, this syllabus was modified from their Spring 2016, Fall 2015, and Spring 2017 seminars, respectively.*

**Environmental Systems Seminar Spring 2018 Schedule**

**Wednesdays, 12:30-1:50, COB (CLSSRM) 113** [Version 1-1, updated 2018.01.11]

| Date | Presenter | UCM Host | Working Title/Topic |
|---|---|---|---|
| Jan 17 | ES Lead Group | ES Lead Group | Syllabus and Seminar Structure |
| Jan 24 | Kevin Simonin | Stephen Hart | *Genome downsizing drove physiological novelty and the rise of the flowering plants* |
| Jan 31 | Jeremy Wimpey | Jeffrey Jenkins | *Outdoor recreation management on Public Lands, balancing resource protection with recreation access* |
| Feb 7 | Susan Harrison | Jason Sexton | *Winter Drought and Community Change in Californian Grasslands* |
| Feb 14 | Park Williams | Leroy Westerling | *The impact of human-caused warming on drought and forest fire in the western US* |
| Feb 21 | Arnold Dekker | Erin Hestir | *Design Considerations for An Aquatic Ecosystem Earth Observing System* |
| Feb 28 | Barbara Cade-Menun | Student Nomination | *Phosphorus Forms and Cycling in Soils and Other Environmental Samples* |
| Mar 7 | Erin Hestir | ES Seminar Series Lead | *Remote Sensing for Aquatic Ecosystem Sustainability* |
| Mar 14 | Jennifer Martiny* | Mark Dawson | *The role of microbial communities in mediating ecosystem to environmental change* |
| Mar 21 | Mark Rains | Joshua Viers | *Connecting the Dots: Hydrological Connectivity between Vernal Pools and Downgradient Waters* |
| Mar 28 | *Spring Break No Seminar* | | |
| Apr 4 | Jeffrey Mount | Joshua Viers | *Consequences of Groundwater Sustainability in California* |
| Apr 11 | Nicola Ulibarri | Martha Conklin | *Collaborative Governance and Modeling for Managing Water Infrastructure* |
| Apr 18 | David Sandino | Marc Beutel | *Understanding the Sacramento-San Joaquin Delta: Ecosystem and Water Supply.* |
| Apr 25 | John Harte | Asmeret Berhe | *Predicting the Fate of Ecosystems in the Anthropocene* |
| May 2 | Kurt Schwabe | Roger Bales | *The role of information, water markets, and externalities on the efficient allocation of water in California: Two Case Studies* |

*Student Nomination



# CONTRIBUTIONS

# Commentary

## Ten Generic Seminar Questions

Often it is difficult for many faculty and graduate students to come up with good questions after a seminar. However, after attending many seminars over more than three decades in science, it is apparent to me that there are categories of substantive questions that are often asked, or could be asked, at seminars. Although my experience is generally with seminars in ecology, evolution, and related fields, these categories probably extend to other areas of biology.

Below I have listed 10 such generic questions, ones that may be fitted with specific details, indicated by ellipses, to fit the topic or data from the seminar. The questions are set in a statistical or scientific hypothesis framework, the general categories of which are indicated in parentheses at the end of the question. Not only may such a framework give credibility to the question, but also it should provide a common language for the speaker, questioner, and the rest of the audience.

Remember that these questions are being asked of your colleague or guest, and that you are honestly trying to find out more about the topic (sometimes this is hard to keep in mind). Questions should be asked in a positive and constructive tone so that profitable discussion ensues. If possible, it is useful to introduce the question with some kind of complimentary preface, such as, "I really thought that your experiment was well-designed and particularly liked ...." or "Your data on the ... are very interesting and show that ...."

These questions may prove useful in several other situations. For example, students, in preparing for their thesis defense, may find them helpful in thinking about their research in a framework that others may use to ask them questions. Also, when there are no questions from the audience after a talk at a colloquium, the moderator may base a question on one of them to start discussion.

My overall hope is that these questions will encourage the reluctant listener to ask his or her question and to stimulate important and reasonable discourse after seminars.

1) In your outline of the effect of..., you assumed that.... Is this predicted from a theoretical (mathematical) model, and how robust is it? (Verbal or conceptual model vs. explicit theoretical model.)

2) Your model has many parameters, and thus may be consistent with many different arrays of results. How possible is it to show that your model is inconsistent with your data? Can it be shown that your model is more appropriate than an alternative model that includes...? (Appropriate model.)

3) In order to eliminate the effect of ..., wouldn't it have been appropriate to have an experiment in which... ? (Appropriate control.)

4) Is there another explanation for your results, for example ..., and how would you exclude that as a possibility? (Alternative hypotheses.)

5) Your results are consistent with the hypothesis (model) that... . What specific, testable predictions follow from this hypothesis, and what experiments would you perform to ex- amine it? (Testable predictions from hypotheses.)

6) Is there evidence that your results,..., are general in other organ- isms, for other traits, etc.? (Generality of data, same results in independent experiments by other researchers.)

7) In an experiment (other data) ... showed that.... This appears inconsistent with your results, model, etc. How could you explain this difference? (Generality of results.)

8) Your findings were consistent with your prediction (hypothesis, model)... . How likely were you to detect a difference from your pre- diction if it were in fact present? (Statistical power, Type II error.)

9) In the figure (table) ..., it appeared that the ... was not consistent with your prediction (hypothesis). Have you followed up with observations to see if this replicable? Is it replicable for the same trait, in other organisms, etc.? (Repeatability of results, Type I error.)

10) You carried out a number of experiments (had many data sets, etc.). Should the significance level have been adjusted because of the large number of tests carried out? (Multiple comparisons.)

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