University of California Merced

Spring 2017 Environmental Systems Seminar Series

ES 291: Environmental Systems Seminar

ESS 190: Earth System Science Undergraduate Seminar

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 105

Instructor: Jeffrey Jenkins (jeff.jenkins@ucmerced.edu)

Office Hours: Tuesdays 1:30-3 pm or by apt; SSM 202B

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 12 of the 15 seminars.

2. The invited speaker will present a ~50 minute seminar followed by ~20 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.). Don't 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.

4. For two of the seminars during the semester, you must write a 1-page, typed, single spaced summary of the talk. The purpose of this exercise is to help you practice writing. Your summary

must be written in clear, grammatical English. The speaker's published abstract and supporting articles may be used for background, but plagiarism of this material will cause rejection of your summary and no credit. Be sure to proof read your paper and/or have the paper reviewed by another student, and edit accordingly. Turn in hard copies of your summaries to me at the end of the seminar following the seminar you are reporting on. The first summary must be turned in no later than March 1, and your second summary must be completed no later than April 26. Late papers will not be accepted. In the summary, you should cover:

Who – Who is giving this talk? What is their background, where do they work, etc.

What – What is the topic of the talk?

Why – What motivated the researcher to study this topic, and why is it important?

How – What methods did they use to address their major questions on this topic?

Results – What were their conclusions? Discuss how has this talk influenced your thoughts about the study of Earth System Science or Environmental Systems as a field of study or as a career.

Course Grading for Undergraduates and Graduate Students: Seminar attendance (50%), participation in post seminar discussions (10%), and two writing assignments (40%).

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 and Dr. Emily Moran; this syllabus was modified from their Spring 2016 and Fall 2015 seminars, respectively.

Environmental Systems Seminar Spring 2017 Schedule

Wednesdays, 12:30-1:50, COB 105

January 25: Mengqiang (Mike) Zhu (University of Wyoming) *Title TBD* (Host: Stephen Hart)

February 1: Benjamin Sullivan (University of Nevada, Reno) *Biogeochemistry of Tropical Forests* (Host: Stephen Hart)

February 8: Jeremy Wimpey (Applied Trails Research) *Title TBD* (Host: Jeffrey Jenkins)

February 15: Binayak Mohanty (Texas A&M) *Title TBD* (Host: Teamrat Ghezzehei)

February 22: Steven Sadro (UC Davis) *Title: Exploring the climate sensitivity of Sierra Nevada lakes and the consequences of warming for ecosystem function* (Host: Marc Beutel).

March 1: Jon Keeley (U.S. Geological Survey) *Different future fire regimes in climate-limited vs. ignition-limited ecosystems* (Host: Emily Moran)

March 8: Grad student speaker? Or Nathan Reigner?

March 15: Hoori Ajami (UC Riverside) *Towards Improved Hydrologic Prediction using Integrated Land Surface-Groundwater Models* (Host: UC Water)

March 22: Joe Wagenbrenner (U.S. Forest Service) *Watershed impacts of wildfire and post-fire management* (Host: Roger Bales)

April 5: Gara Villalba (UC Merced) *Simulation of Carbonyl Sulfide (COS) to better understand the urban biosphere signal* (Host: Elliott Campbell)

April 12: Scott Anderson (Northern Arizona University) *Paleo-ecology and paleo-history of Sierra forests during the Holocene, with particular reference to biogeography of giant sequoia* (Host: Stephen Hart)

April 19: Open seminar slot – Martin Nie? Or Nathan Reigner?

April 26: Kurt Schwabe (UC Riverside) *Title TBD* (Host: UC Water)
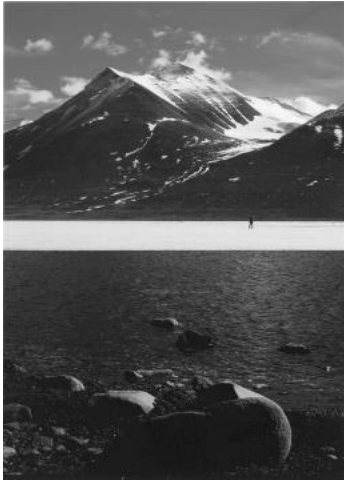
CONTRIBUTIONS

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 ex- ample, 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) Y our 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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