

NR470/471 Sierra Nevada Forest Ecology

Instructor

Dr. Sarah Bisbing

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Office Location

180-506

Office Hours

M 10:00am – 12:00pm

W 10:00am – 11:00am

Or by appointment

Course Meeting Times

W* 3:10 – 6:00 pm

*See Schedule for Course Meeting Dates

Course Overview: Advanced ecological, biogeographical, and silvicultural exploration of Sierra Nevada forests. Designed to support critical thinking skills for application to forest management and conservation. Includes: review and interpretation of scientific literature; advancement of oral presentation skills; interaction with managers and researchers; and development of observational, field, and scientific writing skills.

Learning Objectives:

- Learn to evaluate the ecological and biogeographical history of forest ecosystems
- Identify the dominant tree species of each subregion
- Gain a greater understanding of ecological theory and the natural history of Sierra Nevada forests
- Develop field skills necessary to examine forest history, dynamics, and future condition
- Advance oral, written, and field assessment skills
- Use understanding of species' adaptations and distributions to inform management and conservation action.

Trip Fee: Will be calculated based on camping fees and agreed upon food costs. TBD.

Prerequisites: Requires completion of NR 208 (Dendrology), NR306 (Natural Resource Ecology), and NR365 AND/OR Consent of Instructor.

Text: No textbook required. Bi-weekly readings available via PolyLearn. Suggested books: 1) Sierra Nevada Tree Identifier by Paruk and 2) Discovering Sierra Trees by Arno. Both available on Amazon.

Course Content: Over the course of the quarter, we will progress through the foundational topics of forest ecology and management within Sierra Nevada ecosystems, including climate and biomes, communities and ecosystem types, species distributions, natural disturbance agents and regimes, forest management for ecological vs. economic objectives, wildfire, disturbance interactions, resistance versus resilience, and climate change predictions and response. Each course meeting will consist of lecture on relevant topics followed by discussion of assigned readings.

NR470 Readings and Assignments

Assigned Reading: Weekly readings will be posted to PolyLearn, which will include peer-reviewed articles, book chapters, and Federal technical reports related to ecology, biogeography, and management of Sierra Nevada forest ecosystems.

Group Presentations & Discussion Lead: These discussions are designed to expose you to the current state of science and management in the Sierra Nevada. You are required to read and summarize each paper in addition to leading discussion of one paper. All students must read the assigned paper and prepare a one-page (maximum!) summary of the main points and THREE questions to help facilitate discussion. Come prepared to participate.

Assignments: Assessments will include biweekly essays from a list of discussion questions, journal article summaries, and discussion leading.

NR471 Assessments

NR471 students will be evaluated in the field with a plant ID exam, completion of a field notebook, and a final paper summarizing the field trip. While in the field, you will learn and be tested on the local conifer species of the Sierra Nevada, including identifying species by crown form, bark, cones, and needles. Field notebooks will be required, and you will be tasked with journaling your experiences throughout the trip. The final assessment will be a wrap-up essay, pulling from your journals and assigned readings, that focuses on how the topics covered in the course will help address critical (and often controversial) issues in forest management and conservation. The field notebook and final paper are due one week after our return. Details to follow (!!!).

Homework Policy

Assignments are to be turned in via PolyLearn before class on the due date. Late assignments will be penalized at 20% per day and will not be accepted two days after the due date. This holds true for both lecture and lab assignments

Attendance and Participation

Attendance is mandatory. Attendance and participation will count toward your professionalism grade. Course meetings are designed to provide a framework for the ecological and biogeographical dynamics of Sierra Nevada forest ecosystems and to prepare you for our weeklong field studies course.

Disability

If you have a documented disability and wish to discuss academic accommodations, please contact me as soon as possible. We want you to have a great experience in this class no matter what your background or needs!

Grading

NR470

- Discussion Question Essays (40%)
- Journal Article Discussion Lead (10%)
- Journal Article Summaries (15%)
- Take Home Final (25%)
- Professionalism (10%)

The final exam will ask you to think critically and evaluate forest ecosystem management and conservation. The exam will be take home, open book, and cover material from lectures (including everything discussed and written on the board), readings, and homework assignments. I will be evaluating your ability to synthesize information and write a strong, technical paper.

NR471

- Plant ID Exam (20%)
- Field Journal (20%)
- Final Paper (60%)

Grading Scale is as follows: 100 – 93% = A, 92 – 90% = A-, 89 – 87% = B+. 86 – 83% = B, 82 – 80% = B-, 79 – 77% = C+, 76 – 73% = C, 72 – 70% = C-, 69 – 67% = D+, 66 – 63% = D, 62 – 60% = D-, < 60% = F.

A curve may be generated at any time at the discretion of the instructor.

Tentative NR470 Schedule

Date	Subject	Readings* & Assignments
March 30	Course Intro & Field Studies Planning Sierra Nevada Climates, Biomes, & Species' Distributions	Fites-Kaufman et al. 2006 van Wagtenonk and Fites-Kaufman 2006
April 6	Rare & Captivating Conifers <i>Group 1 Discussion Lead</i>	Discussion Questions 1 LaMarche 1973, Swetnam et al 2009
April 13	Faculty Strike: NO CLASS W	Discussion Questions 1 Due
April 20	Disturbance – Wildfire <i>Group 2 Discussion Lead</i>	Discussion Questions 2 Scholl and Taylor 2012, Swetnam et al. 2009
April 27	NO CLASS	Discussion Questions 2 Due
May 4	Disturbance –Historic versus current <i>Group 3 Discussion Lead</i>	Discussion Questions 3 Knapp et al 2013, North et al 2015
May 11	NO CLASS	Discussion Questions 3 Due
May 18	Climate Change Impacts <i>Group 4 Discussion Lead</i>	Discussion Questions 4 Millar et al. 2007, 2015
May 25	NO CLASS	Discussion Questions 4 Due
June 1	Field Studies Planning	Read Before Trip: PSW_GTR_220 PSW_GTR_237
June 8	Take Home Final Due by 5pm	

* Readings should be completed prior to each date listed. These readings will be the basis of class discussion

Tentative NR471 Schedule

Date	Travel & Field Studies	Camping Location
Sunday, June 12	Depart Cal Poly at 7am Arrive Red Rocks State Park by 1pm <u>Topics:</u> Ecology & Biogeography of Joshua Tree Forests & Mojave Desert	Red Rocks State Park
Monday, June 13	Depart Red Rocks State Park by 7am Arrive at Horseshoe Natural Research Area by 1pm <u>Topics:</u> High elevation forests, exploration of foxtail and lodgepole pine forest	Horseshoe Natural Research Area
Tuesday, June 14	Day trip to Cottonwood Lakes Area <u>Topics:</u> historic fire regimes, historic climate, and predictions of future conditions	Horseshoe Natural Research Area
Wednesday, June 15	Depart Horseshoe by 8am Site Visit to Bristlecone pine forest <u>Topics:</u> Rare, endangered conifers, assisted migration	White Mountains Campground
Thursday, June 16	Depart White Mountains by 8am Stop in Mammoth: Dry, mixed-conifer forests Arrive in Yosemite National Park by 4pm	Tuolumne Volunteers Campsite
Friday, June 17	Tuolumne Meadows Restoration Work <u>Guest Lecturers:</u> Sue Beatty (NPS) & Dr. Evan Wolf (UC Davis)	Tuolumne Volunteers Campsite
Saturday, June 18	Depart Tuolumne Campsite by 8am Site visits along Tioga Pass (Hwy 120) Arrive at STEF by 5pm	Stanislaus-Tuolumne Experimental Forest (STEF)
Sunday, June 19	STEF Ecology & Field Sampling <u>Guest Lecturers:</u> Dr. Eric Knapp (USDA PSW), Bob Carlson (USDA PSW), Emily O'Dean, & Marissa Vossmer	STEF
Monday, June 20	Plant ID Exam Depart STEF by noon	Your bed!!!