EART 290L - Climate, Fire and Geomorphology – Spring 2011

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Course overview: In California, wildfires drive often catastrophic ecological and landscape evolution. How will California's fire regime change in the 21st century, and what might the consequences of this change be for landscapes? This is an overarching question that scientists, politicians and land-managers are currently grappling with. In this class, we will explore how fire, vegetation, climate, and geomorphology are linked through close reading of papers that span Quaternary geology, climate modeling, atmospheric science, and geomorphology.

Objectives: Gain the necessary background to comprehend and critically evaluate papers devoted to the interactions of fire, climate and landscapes. Gain experience evaluating, summarizing and presenting technical scientific publications.

General Approach: Lecture at the beginning of each class to get everyone comfortable with the background for each paper followed by discussion of the journal article(s) to be led by a student(s).

Course Material: All the articles we'll read will be made available for download as PDFs on a course website:

https://sites.google.com/site/ucscgeomorphology/home/teaching/fire/papers

Evaluation: The course is pass/no pass. Passing is contingent on attending classes, leading, and contributing to discussions.

Attendance Policy: If you are unable to make it to 1 or 2 classes, let us know in advance and we'll figure out a solution. However, students will not pass the class if more than 2 classes are missed.

Course Schedule and Reading Assignments -

3/28 - Course Overview, Scheduling, Logistics

4/4 - Week 1: When, where and why do fires occur, weather and climatic conditions conducive to fires

1. Minnich (2006)
2. Bowman et al. (2009)
3. Power et al. (2008)

4/11 - Week 2: Geomorphic Impacts of Fire I

1. Shakesby and Doerr (2006)
2. John McPhee, Los Angeles Against the Mountains – II (from the New Yorker)

4/18 - Post-fire Debris Flows

1. USGS Fact Sheet 2004-3142
2. Cannon et al. (2003)
3. Santi et al. (2008)

4/25 – Fires and Landscape Evolution in Southern California vs. Northern California

1. Wells (1987)
1. Booker et al. (1993)
2. Jackson and Roering (2009)

5/2 - Fires, Debris Flows, Climate, and Vegetation over the Holocene

1. Meyer et al. (1995)
2. Mohr et al. (2000)

5/9 - Fire Management, Vegetation, and Fire Frequency and Intensity

1. Minnich and Chou (1997)
2. Mensing (1999)
3. Keeley et al (1999)

5/16 - Impacts of Fire on Climate, Weather Carbon Cycle

1. Chambers et al. (2005)
2. Randersen et al. (2006)
3. Mieville et al. (2010)

5/23 - Climate and Vegetative Change into the Future California

1. Goetz et al. (2007)
2. Hadley et al. (2010

5/30 - Forecast Changes in Fire Regime

1. Theobald & Romme (2007)
2. Arora & Boer (2005)
3. Flannigan et al. (2009)