Climate and Tectonics of South America (Spring 2011)

GEO 171C (27782); GEO 191 (27971)

Location: JGB 2.202
Time: Tue 1130-1230
Professors: Brian Horton and Tim Shanahan
Offices: JGB 5.220A (Horton); EPS 3.126 (Shanahan)
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Textbooks
None; all assigned readings from published scientific articles.

BlackBoard Use
PowerPoint lectures and lab handouts are available on BlackBoard. It is expected that you have a computer with internet access or that you have access to these facilities.

Overview:
This is a seminar style class meant for advanced undergraduates and graduate students. Seminar will meet on Tuesdays 1130-1230 in JGB 2.202.

Course content:
This seminar will explore aspects of the tectonic and climatic evolution of South America. We will pursue recent key literature on the evolution of the Andes, Amazon, and other regions, and will likely combine some geographically focused readings (Patagonia, Amazon) with some topical issues (paleoaltimetry, paleodrainage, etc). The readings and topics can be modified somewhat to address the interests of the class, and the goal will be to develop a greater understanding of the key outstanding scientific questions in this region, and to build a sufficient level of understanding to generate ideas for new collaborative research projects.

Course Credit:
The class meeting each week will involve a one-hour discussion of that week's assigned reading. One student will lead the discussion, and draw upon additional readings relevant to the issue. This will involve making a summary presentation including ppt (or other) presentations of all relevant figures available. A second student will be responsible for helping to lead and stimulate the discussion. Shanahan and Horton will provide guidelines for the discussions and background lectures when necessary. Grades will be based on participation and the quality of the presentations. We anticipate that each student will be responsible for ca. 2 presentations and for leading two discussions.

Policy on Grades:
Final Grades: Your final grade will be cumulative based on your 2 paper presentations, 2 discussions and regular seminar preparation and participation. Grades will be assigned on the A, B, C, D, F scale.

The University Honor Code: "The core values of The University of Texas at Austin are learning, discovery, freedom, leadership, individual opportunity, and responsibility. Each member of the University is expected to uphold these values through integrity, honesty, trust, fairness, and respect toward peers and community."

Students are expected to read and to strictly adhere to the University's written policies on academic dishonesty. Cheating or plagiarism will result in a zero for the semester.

A note to students with disabilities: students with disabilities may request appropriate academic accommodations from the Division of Diversity and Community Engagement, Services for Students with Disabilities, 471-6259.

TENTATIVE READING LIST

1	25-Jan	**Introduction and logistics** Discussion of student interests Horton and Shanahan: overview, emerging issues, etc
2	1-Feb	**Modern climate of South America** Garreaud et al., 2009 P3 Strecker et al., 2007, Annual Reviews of EPS Lenters and Cook, 1995, Journal of Climate + Bookhagen and Strecker, 2008, GRL
3	8-Feb	**Climate and tectonics** Clift 2010, GRL Lamb and Davis, 2003, Nature Montgomery et al., 2001, Geology Whipple, 2009, Nature Geosciences + McQuarrie et al., 2008 Geology
4	15-Feb	**Paleoaltimetry** Cassel et al., 2009, Geology Rowley and Garzione, 2007, Annual Reviews of EPS Polissar et al., 2009, EPSL + Hren et al., 2010, Geology
5	22-Feb	**Uplift of the Altiplano** Gregory-Wodzicki, 2000, GSA Bulletin Mulch et al., 2010 EPSL Garzione et al., 2008, Science (and Introduction by Kerr) + Rech et al., 2006, Geology
6	1-Mar T	**Uplift vs. climate complications** Ehlers and Poulsen, 2009, EPSL Insel et al., 2010, Climate Dynamics

		Poulsen et al., 2010, Science + Garreaud2010-EPSL
7	8-Mar T	**Uplift of the Eastern Cordillera** Barke and Lamb, 2006, EPSL McQuarrie et al., 2008, Tectonics Mora et al., 2008, GSA Bulletin
8	15-Mar	**Evolution of Amazon drainage** Harris and Mix, 2002, Geology Hoorn et al., 1995, Geology Hoorn et al., 2010, Ch. 7, Hoorn and Wesselingh, eds. Mora et al., 2010, Ch. 4, Hoorn and Wesselingh, eds. Roddaz et al., 2010, Ch. 5, Hoorn and Wesselingh,eds.
	22-Mar	Spring break
9	29-Mar	**Amazon interior seaway** Hernandez et al., 2005, J of South Amer Earth Sciences Hoorn et al., 2010, Science Shephard et al., 2010, Nature Geosciences Uba et al., 2009, Geology
10	30-Mar	**Amazon Fan** Abouchami and Zabel, 2003, EPSL Dobson et al., 2001, PPP Figueiredo et al., 2009, Geology
11	5-Apr	**Isthmus of Panama** Coates et al., 1992, GSA Bulletin Haug and Tiedemann, 1998, Nature Lunt, 2008, Climate Dynamics Molnar, 2008, Paleoceanography + Pindell and Kennan, 2009, Geol Soc London Sp Pub
12	12-Apr	OPEN
13	19-Apr	**Patagonia** Blisniuk and Stern, 2005, American Journal of Science Dietrich et al., 2010 EPSL Thomson et al., 2010, Nature (Introduction by Braun)
14	26-Apr	**Drake Passage** Barker and Thomas, 2004, Earth-Science Reviews Lagabrielle et al., 2009, EPSL Scher and Martin, 2006, Science
15	3-May T	Synthesis