

Tectonics and Climate 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)
 Office hours: 3-4pm Tue/Thu (Horton); by appointment (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

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 Garzzone, 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
Garzzone et al., 2008, Science (and Introduction by Kerr)
+ Rech et al., 2006, Geology |
| 6 | 1-Mar | 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 **Incision vs. Uplift**
Schildgren et al., 2007, Geology
Hoke et al., 2007, Tectonics
Hoke and Garzione, 2008, EPSL
- 15-Mar Spring break
- 8 22-Mar **Uplift of the Eastern Cordillera**
Barke and Lamb, 2006, EPSL
McQuarrie et al., 2008, Tectonics
Mora et al., 2008, GSA Bulletin
- 9 29-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.
- 10 5-Apr **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
- 11 12-Apr **Amazon Fan**
Abouchami and Zabel, 2003, EPSL
Dobson et al., 2001, PPP
Figueiredo et al., 2009, Geology
- 12 19-Apr **Isthmus of Panama**
Coates et al., 1992, GSA Bulletin
Haug and Tiedemann, 1998, Nature
Lunt, 2008, Climate Dynamics
Molnar, 2008, Paleocyanography
+ Pindell and Kennan, 2009, Geol Soc London Sp Pub
- 13 3-May **Patagonia**
Blisniuk and Stern, 2005, American Journal of Science
Dietrich et al., 2010 EPSL
Thomson et al., 2010, Nature (Introduction by Braun)
- 14 10-May **Drake Passage**
Barker and Thomas, 2004, Earth-Science Reviews
Lagabriele et al., 2009, EPSL
Scher and Martin, 2006, Science