

Dynamics of the Andes

Seminar info and schedule

For the winter semester 2015 we'll focus our reading and discussions on the climate, tectonics and geodynamics of the Andes. Specifically, we'll aim to review the general tectonics and then focus on relevant papers related to two new research projects on the Andes. Seminars will take place at 12-13.30 in room D501 of the Exactum. You may also want to see [more information about the general format of the seminar](#).

A tentative schedule of readings is below.

Date	Discussion leader(s)	Topic and papers
5.2.2015	n/a	Organizational meeting. Selection of seminar meeting time, suggested papers to discuss, ideas for other topics, etc.
19.2.2015 (postponed)	Dave	<p>Introduction to Andean tectonics</p> <p>Discussion paper: Dewey, J. F., and S. H. Lamb (1992), Active tectonics of the Andes, <i>Tectonophysics</i>, 205(1–3), 79–95</p> <p>Supplemental reading: Lamb, S., L. Hoke, L. Kennan, and J. Dewey (1997), Cenozoic evolution of the Central Andes in Bolivia and northern Chile, <i>Geological Society, London, Special Publications</i>, 121(1), 237–264.</p>
26.2.2015	Dave	<p>Introduction to Andean tectonics</p> <p>Discussion paper: Dewey, J. F., and S. H. Lamb (1992), Active tectonics of the Andes, <i>Tectonophysics</i>, 205(1–3), 79–95</p> <p>Supplemental reading: Lamb, S., L. Hoke, L. Kennan, and J. Dewey (1997), Cenozoic evolution of the Central Andes in Bolivia and northern Chile, <i>Geological Society, London, Special Publications</i>, 121(1), 237–264.</p>
12.3.2015	Jorina	<p>Geological background on the Andes</p> <p>Discussion paper: Lamb, S., L. Hoke, L. Kennan, and J. Dewey (1997), Cenozoic evolution of the Central Andes in Bolivia and northern Chile, <i>Geological Society, London, Special Publications</i>, 121(1), 237–264.</p> <p>Supplemental reading: Isacks, 1988, Uplift of the Central Andean Plateau and bending of the Bolivian Orocline, <i>Journal of Geophysical Research</i></p>
19.3.2015	Lars	<p>Nazca plate subduction</p> <p>Discussion paper: Gutscher, M.-A., W. Spakman, H. Bijwaard, and E. R. Engdahl (2000), Geodynamics of flat subduction: Seismicity and tomographic constraints from the Andean margin, <i>Tectonics</i>, 19(5), 814–833, doi:10.1029/1999TC001152.</p>
26.3.2015	Dave	<p>Influence of flat slab subduction on South American dynamic topography</p> <p>Discussion paper: Eakin, C. M., C. Lithgow-Bertelloni, and F. M. Dávila (2014), Influence of Peruvian flat-subduction dynamics on the evolution of western Amazonia, <i>Earth and Planetary Science Letters</i>, 404(C), 250–260, doi:10.1016/j.epsl.2014.07.027</p>
2.4.2015	Jorina	<p>Climate and uplift in the Andes</p> <p>Discussion papers: Montgomery, D. R., G. Balco, and S. D. Willett (2001), Climate, tectonics, and the morphology of the Andes, <i>Geology</i>, 29(7), 579–582</p> <p>Lamb, S., and P. Davis (2003), Cenozoic climate change as a possible cause for the rise of the Andes, <i>Nature</i>, 425(6960), 792–797, doi:10.1038/nature02049</p>
23.4.2015	Niclas	<p>Climate, erosion and tectonics in the Bolivian Andes</p> <p>Discussion papers: McQuarrie, N., T. A. Ehlers, J. B. Barnes, and B. Meade (2008), Temporal variation in climate and tectonic coupling in the central Andes, <i>Geology</i>, 36(12), 999–1002</p> <p>Barnes, J. B., T. A. Ehlers, N. Insel, N. McQuarrie, and C. J. Poulsen (2012), Linking orography, climate, and exhumation across the central Andes, <i>Geology</i>, 40(12), 1135–1138</p>
7.5.2015	Dharmindar	<p>Isotope records of Andean uplift</p> <p>Discussion papers: Garzzone, C. N., G. D. Hoke, J. C. Libarkin, S. Withers, B. MacFadden, J. Eiler, P. Ghosh, and A. Mulch (2008), Rise of the Andes, <i>Science</i>, 320(5881), 1304–1307, doi:10.1126/science.1148615</p> <p>Leier, A., N. McQuarrie, C. Garzzone, and J. Eiler (2013), Stable isotope evidence for multiple pulses of rapid surface uplift in the Central Andes, Bolivia, <i>Earth and Planetary Science Letters</i>, 371-372(0), 49–58, doi:10.1016/j.epsl.2013.04.025</p>
21.5.2015	Niclas	<p>Geomorphic record of Andean uplift</p> <p>Discussion papers: Gubbels, T. L., B. L. Isacks, and E. Farrar (1993), High-level surfaces, plateau uplift, and foreland development, Bolivian central Andes, <i>Geology</i>, 21(8), 695–698</p> <p>Hoke, G. D., B. L. Isacks, T. E. Jordan, N. Blanco, A. J. Tomlinson, and J. Ramezani (2007), Geomorphic evidence for post-10 Ma uplift of the western flank of the central Andes 18°30–22°S, <i>Tectonics</i>, 26(5), n/a–n/a, doi:10.1029/2006TC002082</p>
28.5.2015	Francis	<p>Andean analogues</p> <p>Discussion paper: Schulmann, K., J. Konopásek, V. Janoušek, O. Lexa, J.-M. Lardeaux, J.-B. Edel, P. Štípská, and S. Ulrich (2009), An Andean type Palaeozoic convergence in the Bohemian Massif, <i>Comptes Rendus Geoscience</i>, 341(2-3), 266–286, doi:10.1016/j.crte.2008.12.006</p>

Papers under consideration

General background

- Allmendinger et al., 1997, The evolution of the Altiplano-Puna Plateau of the Central Andes. *Ann Rev Earth Planet Sci*
- Collins, W. J., E. A. Belousova, A. I. S. Kemp, and J. B. Murphy (2011), Two contrasting Phanerozoic orogenic systems revealed by hafnium isotope data, *Nature Geoscience*, 4(5), 333–337, doi:10.1038/ngeo1127

Climate, erosion and tectonics

- Barnes, J. B., T. A. Ehlers, N. Insel, N. McQuarrie, and C. J. Poulsen (2012), Linking orography, climate, and exhumation across the central Andes, *Geology*, 40(12), 1135–1138.

Uplift history of the Altiplano-Puna plateau / magmatic history

- Work by Mihai Ducea and others
- Barnes, J. B., and T. A. Ehlers (2009), End member models for Andean Plateau uplift, *Earth-Science Reviews*, 97(1-4), 105–132, doi:10.1016/j.earscirev.2009.08.003

Earthquakes / tomography

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Analogous orogens

- Schulmann, K., J. Konopásek, V. Janoušek, O. Lexa, J.-M. Lardeaux, J.-B. Edel, P. Štípská, and S. Ulrich (2009), An Andean type Palaeozoic convergence in the Bohemian Massif, *Comptes Rendus Geoscience*, 341(2-3), 266–286, doi:10.1016/j.crte.2008.12.006

Other ideas?

- Here's a [recent Andes discussion seminar](#) by the geomorphology group at Arizona State