

Monday, Sep 24, 2012

11:15 - 12:45

Lecture I - Neotectonics – why bother?

Manfred Strecker, UP

14:00 - 15:30

Lecture II - Indicators of tectonic stress fields

Manfred Strecker, UP

16:00 - 17:30

Lecture III - Geomorphic indicators of tectonic activity in marine environments

Manfred Strecker, UP

Suggested Reading:

Zoback, M.D. and Zoback, M.L., 1991. Tectonic stress field of North America and relative plate motions. Neotectonics. Decade of North American Geology, Chapter 21, Geol. Soc. America.

Stein, S. and Liu, M., 2009. Long aftershock sequences within continents and implications for earthquake hazard assessment.

Tuttle, M. and Seeber, L., 1991. Historic and prehistoric earthquake-induced liquefaction in Newbury, Massachusetts. Geology, 19, 594-597.

Stress, faults and folds (Chapter 4 in Burbank and Anderson, Tectonic Geomorphology, Blackwell)

Active tectonics and coastlines (Chapter 6 in Pinter and Keller)

Bookhagen, B., H.P. Echtler, D. Melnick, M.R. Strecker, and Spencer, J., 2006. Holocene coastal landform evolution, strandlines, and earthquake recurrence intervals in south-central Chile. Geophysical Research Letters, 33, OL 33, doi:10.1029/2006GL026734

Yeats, Sieh and Allen, 1997, Chapter 11, The Geology of earthquake regions, Oxford University Press

Tuesday, Sep 25, 2012

09:00 - 10:30

Lecture IV - The seismic cycle of subduction zones

Daniel Melnick, UP

11:00 - 12:30

Lab - Megathrust earthquakes, tectonic geomorphology of coastal regions

Daniel Melnick, UP

Suggested Reading:

Cisternas, M., Atwater, B.F., Torrejón, F., Sawai, Y., Machuca, G., Lagos, M., Eipert, A., Youlton, C., Salgado, I., Kamataki, T., Shishikura, M., Rajendran, C.P., Malik, J.K., Rizal, Y., and Husni, M., 2005. Predecessors of the giant 1960 Chile earthquake. *Nature*, 437, 404-407.

Satake, K., and Atwater, B.F., 2007. Long-term perspectives on giant earthquakes and tsunamis at subduction zones. *Annual Review of Earth and Planetary Sciences*, 35, 349-374.

Sieh, K., Natawidjaja, D.H., Meltzner, A.J., Shen, C.C., Cheng, H., Li, K.S., Suwargadi, B.W., Galetzka, J., Philibosian, B., and Edwards, R.L., 2008. Earthquake supercycles inferred from sea-level changes recorded in the corals of west Sumatra. *Science*, 322, 1674-1678.

Melnick, D., Bookhagen, B., Strecker, M.R., and Echtler, H., 2009. Segmentation of megathrust rupture zones from forearc deformation patterns over hundreds to millions of years, Arauco peninsula, Chile. *J. Geophysical Research – Solid Earth*, 114, doi: 10.1029/2008JB005788.

14:00 - 15:30

Lecture V – Long-term records of tectonic activity and geomorphic processes

Taylor Schildgen, UP

16:00 - 17:30

Lecture VI + Lab - Thermochronology and landscape relief

Taylor Schildgen, UP

Suggested Reading:

Ehlers, T.A., 2005, Crustal thermal processes and the interpretation of thermochronometer data, *Reviews in Mineralogy & Geochemistry*, 58, 315-350.

House, M.A., Wernicke, B.P., Farley, K.A., 1998, Dating topography of the Sierra Nevada, CA, using apatite (U-Th)/He ages, *Science*, 396, 66-69.

Pazzaglia, F.J., Brandon, M.T., 2001, A fluvial record of long-term uplift and erosion across the Cascadia Forearc high, western Washington state, *American Journal of Science*, 301, 385-431.

Schildgen, T.F., Whipple, K.X., Hodges, K.V., Reiners, P.W., Pringle M.S., 2007, Uplift of the western Altiplano from canyon incision history, southern Peru, *Geology*, 35(6), 523-526.

Schildgen, T.F., Cosentino, D., Bookhagen, B., Niedermann, S., Yildirim, C., Echtler, H.P., Wittmann, H., Strecker, M.R., 2012, Multi-phase uplift of the southern margin of the Central Anatolian plateau: A record of tectonic and upper mantle processes, *Earth and Planetary Science Letters*, 317-318, 85-95.

Wednesday, Sep 26, 2012

09:00 - 10:30

Lecture VII – Fluvial indicators of tectonic activity: Mechanics of river erosion, steady-state river profiles, and fluvial signatures of tectonic activity

Brian Clarke, UP

11:00 - 12:30

Lecture VIII – Fluvial indicators of tectonic activity: Fluvial response to changing tectonic conditions

Brian Clarke, UP

14:00 - 15:30

Lab – Fluvial indicators of tectonic activity

Brian Clarke, UP

Suggested Reading:

Kirby and Whipple. Quantifying differential rock-uplift rates via stream profile analysis. *Geology* (2001) vol. 29 (5) pp. 415

Duvall et al. Tectonic and lithologic controls on bedrock channel profiles and processes in coastal California. *J. Geophys. Res.* (2004) vol. 109 (F3) pp. F03002

Dibiase et al. Landscape form and millennial erosion rates in the San Gabriel Mountains, CA. *Earth and Planetary Science Letters* (2010) vol. 289 (1-2) pp. 134-144

Whipple. Bedrock rivers and the geomorphology of active orogens. *Annual Review of Earth and Planetary Sciences* (2004) vol. 32 (1)