

## Arjun M. Heimsath

School of Earth and Space Exploration (SESE), Arizona State University (ASU)  
Tempe, AZ 85287-1404

(480) 965-5585 (office)  
(480) 965-8102 (FAX)

Arjun.Heimsath@ASU.edu

### Education

B.S.	1989	Yale College (Honors, Mechanical Engineering)
M.S.	1993	Yale University, School of Forestry and Environmental Studies
Ph.D.	1999	University of California, Berkeley (Geology)

### Relevant Positions

2007-Present	Associate Professor, School of Earth and Space Exploration, ASU
2000-2007	Assistant Professor, Dartmouth College
1999-2000	NSF Post-doctoral Fellow, ANU, OSL for sediment transport rates
1989-1991	Water Development Engineer, US Peace Corps, Kenya

### Select Academic Honors

2007-2008	Guggenheim Fellowship: Soil Erosion and Sustainability
2006	Crosby Distinguished Lectureship, Massachusetts Institute of Technology
2004	Dartmouth College Junior Faculty Fellowship
2004	Presidential Early Career Award for Scientists and Engineers (PECASE)
2003-2007	NSF CAREER Award (5 yr) for research on Geomorphic Transport Laws
2001-2002	Jan De Ploey Prize for contributions to Process Geomorphology
1999-2000	NSF Post-doc Fellow (2 yr) for research on sediment transport rates
1995-1998	NASA Graduate Student Fellowship in Global Change Research
1994-1995	Switzer Environmental Graduate Fellowship

### 5 Recent Publications Related to the Present Proposal (\* denotes Student or post-doc author)

**Heimsath, A.M.**, Hancock, G.R., and Fink, D., 2009. The 'humped' soil production function: Eroding Arnhem Land, Australia. *Earth Surface Processes and Landforms*. In press.

Dixon, J.L.\*, **Heimsath, A.M.**, Kaste, J.M.\*, and Amundson, R., 2009. Climate driven processes of hillslope weathering. *Geology*. In press.

Dixon, J.L.\*, **Heimsath, A.M.**, and Amundson, R., 2009. The critical role of climate and saprolite weathering in landscape evolution. *Earth Surface Processes and Landforms*. DOI: 10.1002/esp.

Burke, B\*, **Heimsath, A.M.**, and White, A.F., 2007. Coupling chemical weathering with soil production across soil mantled landscapes. *Earth Surface Processes and Landforms*. **32**: 853-873. doi10.1002/esp.1443.

**Heimsath, A.M.**, Furbish, D.J., and Dietrich, W.E., 2005. The illusion of diffusion: Field evidence for depth dependent sediment transport. *Geology*, **33**(12): 949-952.

### 5 Additional Related Publications (\* denotes Student or post-doc author)

Burke, B\*, **Heimsath, A.M.**, Chappell, J., and Yoo, K.\*, 2009. Weathering the escarpment: Chemical and physical rates and processes, southeastern Australia. *Earth Surface Processes and Landforms*. DOI: 10.1002/esp.1764.

Kaste, J.M.\*, **Heimsath, A.M.** and Bostick, B. C., 2007. Short-term soil mixing quantified with fallout radionuclides. *Geology*, **35**(3): 243-246.

Yoo, K.\*, R. Amundson, **A. M. Heimsath**, W. E. Dietrich, and G. H. Brimhall, 2007. Integration of geochemical mass balance with sediment transport to calculate rates of soil chemical weathering and transport on hillslopes. *J. of Geophysical Research*, **112**: F02013.

- Heimsath, A.M.**, Chappell, J., Finkel, R.C., Fifield, K., and Alimanovic, A., 2006. Escarpment erosion and landscape evolution in southeastern Australia. *GSA Special Paper 398*, p. 173-190.
- O'Farrell, C.R.\*, **Heimsath, A.M.**, and Kaste, J.M.\*, 2006. Quantification of hillslope and catchment-averaged erosion rates for a small watershed in northern California. *Earth Surface Processes and Landforms*. DOI:10.1002/esp.1407.

### **Collaborations within the last 48 months**

William E. Dietrich, Kunihiko Nishiizumi, Ronald Amundson (UCB)  
Doug Burbank; Oliver Chadwick (UCSB), Robert C. Finkel (Lawrence Livermore Nat'l Lab)  
John Chappell (ANU); Garry Willgoose; Greg Hancock (Univ. of Newcastle); Everett Schock;  
Kip Hodges; Kelin Whipple (ASU); Eric Kirby (Penn State); Kyungsoo Yoo (Delaware)

**Post-Doc collaborator:** John Chappell, Australian National University

**Ph.D. advisor:** William E. Dietrich, University of California, Berkeley

**M.S. advisor:** Paul K. Barten, Yale University

### **5 Examples of synergistic activities**

- \* Associate Editor, *Earth Surface Processes and Landforms*.
- \* Writing/distributing free software for digital elevation model generation from photographs.
- \* Methodological refinement of short-lived isotopes used for sediment tracers (using  $^{241}\text{Am}$ ).
- \* Advising National Parks (California) and Mines (Australia) on erosional processes, with significant input into natural resource stewardship management plans.
- \* Chairing and organizing special sessions for AGU & EGS; organizing committee, National Academy of Sciences, Frontiers of Science symposia.

### **Research Interests**

Geomorphology; Tectonic geomorphology; digital terrain modeling; Quaternary climate changes; Carbon sequestration and the carbon budget; Exposure-age dating ( $^{10}\text{Be}$  &  $^{26}\text{Al}$ ); Glacial geomorphology; Erosion and cliff retreat; Natural hazard assessment and prediction (landslides); Weathering processes and rates;  $^{10}\text{Be}$  and  $^{26}\text{Al}$  concentrations and production rates; Optically stimulated luminescence (OSL) and short lived isotopes ( $^{210}\text{Pb}$ ,  $^7\text{Be}$ ,  $^{137}\text{Cs}$ ,  $^{241}\text{Am}$ ) toward sediment transport processes; Human impacts on the landscape.

### **Field Experience**

*Soil production and erosion:* California and Oregon Coast Ranges, Southeastern Australia, Northern Territories of Australia, South Africa, Nepal, Tibet, Chugach Range in Alaska (using cosmogenic  $^{10}\text{Be}$  and  $^{26}\text{Al}$  and topographic studies), South Africa.

*Bedrock weathering:* Southern Tibet, Nepal, Central and northern Australia, Southern California, Oregon Coast Range, Hubbard Brook, NH, Chugach Range in Alaska.

*Exposure age dating:* Southern Tibet, Bhutan, Nepal, Atacama Desert, Chile, Central Australia, Chugach Range in Alaska

*Optically stimulated luminescence:* Southeastern Australia

*Carbon Sequestration:* Southeastern Australia, northern California, Oregon Coast Range

*Quaternary Climate Changes:* Northern and southeastern Australia, Tibet, Nepal, China

*Human Impacts:* Central and coastal Kenya, South Africa, Indian Himalaya, Nepal Himalaya, Tibet, Oregon and California Coast Ranges.