

# JOHN-ANDREW BALLANTINE

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## EDUCATION

Ph.D. University of California at Santa Barbara, September, 2008.

Dissertation title: "The Influence of Source Landforms, Antecedent Precipitation, and Winds on Dust Events in North Africa"

Principal Advisor: Thomas Dunne

Co-Advisors: Natalie Mahowald, Dar Roberts, Oliver Chadwick, Gregory Okin

M.A. Geography, University of California at Santa Barbara. June, 2001.

Thesis title: "The Response of Groundwater Flow to Topography, Hydrogeology, and Deforestation in Humid Tropical Regions." Thesis Advisor: Thomas Dunne

Sc.B. Geology-Physics/Math with honors, Brown University. June, 1996.

Thesis Title: "Remote Change Detection of Semiarid Vegetation in Owens Valley, CA."

Thesis Advisor: John Mustard

## RESEARCH INTERESTS

Sources of large dust storms, aeolian geomorphology, playa dust sources, soil development due to dust input, arid region meteorology, land use in arid regions

Subsurface hydrology, hydrological modeling, hydrogeology, catchment hydrology, playa hydrology

Soil formation and development; soil responses to human and natural changes; hillslope processes

Multi- and hyper-spectral remote sensing of deserts, land use change, atmospheric aerosols, topography and hydrologic parameters; image processing techniques such as multiple endmember spectral mixture analysis and textural analyses

Linking distributed-parameter process models to coarser scale lumped-parameter models

## PROFESSIONAL EXPERIENCE

University of Connecticut: Assistant Professor in Residence, Dept. of Geography Aug. 2008-Present

Teach classes including Cartography, GIS of Environmental Change, Physical Geography, Human

Modifications of the Natural Environment, and Environmental Evaluation and Assessment

U.S. Geological Survey: Post-Doctoral Researcher with Dr. Richard Reynolds January, 2006-Present

Frame a model for understanding dust sources in the Mojave Desert

Research the link between hydrology and the surface erodibility of playa lakebeds

Develop inventory of North American dust sources; acquire data and supporting documentation from dust researchers; provide interpretations of dust storm activity with respect to surface and meteorological conditions; act as the contact point for the "dust" community.

University of California at Santa Barbara: Graduate Student Researcher July, 1997-June, 2004

Africa: Multiple endmember spectral mixture analysis of MODIS imagery for North Africa to create landform map and vegetation cover; data analysis of surface meteorological data; identification of regions vulnerable to dust erosion from MODIS landform map

Mojave Desert: Assisting Dr. G.S. Okin (U. of Virginia) with spectral and grain size measurements of soils in abandoned fields of the Mojave Desert

Rondonia, Brazil: Analysis of spatial variability of soils across state; Extensive in situ measurements of soil saturated hydraulic conductivity and surface infiltration capacity; landscape analysis; remote sensing of land use change and topography; hydrologic modeling of hillslope response to topography, hydrogeology, and deforestation

Paragominas, Brazil: Installation and upkeep of catchment hydrological monitoring equipment; topographic surveys for hydrological modeling

- Earth Satellite Corporation, Rockville, MD: Applications Scientist June, 1996-June, 1997  
Monitoring land use change in Ohio; working with classified data; airphoto rectification and interpretation; use of Radarsat for flood monitoring after Hurricane Fran; use of GIS for environmental assessment; monitoring arid land agriculture
- Brown University, Providence, RI: Research Assistant Jan., 1995-June, 1996  
Exploration of the response of semiarid vegetation in Owens Valley, CA, to changes in rainfall using spectral mixture analysis; study of fire scars in Owens Valley

#### **PUBLICATIONS, ABSTRACTS, AND PRESENTATIONS**

- Ballantine, J.A.**, N.M. Mahowald, and G.S. Okin, The Influence of Source Landforms, Antecedent Precipitation, and Winds on Dust Events in North Africa, American Geophysical Union, Fall Meeting. San Francisco, CA, December 2008.
- Ballantine, J.A.**, R.L. Reynolds, P. Chavez, G. Clow, R. Fulton, R. Bogle, M. Reheis, F. Urban, C. Wallace, and J. Yount, A framework of field observations and spatial data for understanding dust emissions in the Mojave Desert, American Geophysical Union, Fall Meeting. San Francisco, CA, December 2007.
- Mahowald, N.M., **J.A. Ballantine**, J. Feddema, and N. Ramankutty (2007), Global trends in visibility: Implications for dust sources, *Atmos.Chem.Phys*, 7, 3309-3339.
- Ballantine, J.A.**, Tropical Rainforest Hydrology and Desert Dust Storms: Issues with Model Parameters and Data Validation at the Regional to Continental Scale. University of New Hampshire EOS Water Systems Analysis Group, August, 2007.
- Ballantine, J.A.**, N.M. Mahowald, and G.S. Okin, The influence of landforms on dust generation in North Africa. Sixth International Conference on Aeolian Research. Guelph, Ontario, Canada, July, 2006.
- Ballantine, J.A.**, R. Pelltier, and R. Reynolds, Inventory of North American Dust Sources, Events and Depositional Data. Sixth International Conference on Aeolian Research. Guelph, Ontario, Canada, July, 2006.
- Ballantine, J.A.**, G.S. Okin, N.M. Mahowald, Meteorological conditions during extreme dust events in North Africa. American Geophysical Union, Fall Meeting. San Francisco, CA, December 2005.
- Ballantine, J.A.**, N.M. Mahowald, G.S. Okin, The conditions associated with dust storm generation in North Africa. Geological Society of America, Annual Meeting, Salt Lake City, UT, October, 2005.
- Ballantine, J.A.**, G.S. Okin, D.E. Prentiss, D.A. Roberts (2005), Mapping North African landforms using continental scale unmixing of MODIS imagery, *Remote Sensing of Environment*, 97(4): 470-483.
- Ballantine, J.A.**, G.S. Okin, D.A. Roberts, Identifying Dust Sources in North Africa and Modeling Patterns of Dust. American Geophysical Union, Fall Meeting. San Francisco, CA, December, 2003. Awarded Outstanding Student Paper from Biogeosciences Section.
- Ballantine, J.A.**, T. Dunne, J.M. de Moraes, Modeling the effects of hydrogeology and land cover conversion on runoff processes and rates in Amazônia. American Geophysical Union, Fall Meeting. San Francisco, CA, December, 2002.
- Ballantine, J.A.**, and T. Dunne, The disparity between saturated hydraulic conductivities at point and catchment scales. Chapman Conference on State-of-the-Art in Hillslope Hydrology, American Geophysical Union, Sunriver, OR, October, 2001.
- Ballantine, J.A.**, and T. Dunne, The response of shallow aquifer flow to topography and deforestation in humid tropical regions. American Geophysical Union, Fall Meeting. San Francisco, CA, December, 2000.
- Ballantine, J.A.**, and T. Dunne, Modeling the dependence of groundwater flow on topography and land use for four 1,000 km<sup>2</sup> catchments in Rondonia, Brazil. International Association of Geomorphologists Meeting, Rio de Janeiro, Brazil, July, 1999.
- Ballantine, J.A.**, Invited lecture on remote sensing. Summer Science Program, Ojai, CA, 1999.

Mustard, J.F., **A. Ballantine**, J.A. Grant, and D.A. Roberts, 1995, Spatial and temporal scaling of semiarid region surface properties, *Eos, Trans. American Geophysical Union*, 76, S105.

**TEACHING EXPERIENCE**

<u>University of Connecticut, Storrs, CT:</u> Assistant Professor in Residence		
<i>Introduction to Physical Geography</i>		Spring, 2009
<i>Human Modifications of the Natural Environment</i>		Spring, 2009
<i>Environmental Evaluation and Assessment</i>		Spring, 2009
<i>GIS of Environmental Change</i>		Fall, 2008
<i>Cartographic Techniques</i>		Fall, 2008
<u>University of New England, Biddeford, ME:</u> Instructor		
<i>Introduction to Environmental Issues</i>		Spring, 2007
<u>University of Southern Maine, Gorham, ME:</u> Instructor		
<i>Human-Environmental Geography</i>		Spring, 2007
<u>University of California at Santa Barbara:</u> Lab Instructor/Teaching Assistant		
<i>Biogeochemistry of the Soil Environment</i>	O. Chadwick	Fall 2000
<i>Intro. to Environmental Optics in Physical Geography</i>	P. Dennison	Winter 2000
<u>Brown University, Providence, RI:</u> Lab Instructor/Teaching Assistant		
<i>Environmental Remote Sensing</i>	J. Mustard	Spring 1996
<i>Physical Processes in Geology</i>	T. Tullis and R. Yund	Fall 1995
<i>Planetary Geology</i>	P. Schultz	Spring 1995
<i>Mars, Moon, and the Earth</i>	J. Head III	Fall 1994
<i>Introduction to Astronomy</i>	B. Marston	Spring 1995
<i>Beginning Astronomy</i>	H. Gerritsen	Fall 1993-1994

**SERVICE EXPERIENCE**

City of Saco Conservation Commission, Ward 5 representative		Fall, 2006-Sp 2008
UCSB: Scienceline Program		Fall 1999-2004
UCSB: Review Committee for Office of Instructional Development		Winter 2004
UCSB: Committee on Effective Teaching and Instructional Support		Fall 1999-2003
UCSB: Geography Awareness Week		Fall 1998-2003
UCSB: Geography Faculty Search Committee		Fall 2001
UCSB: Geography Graduate Representative to the Faculty		Fall 2000-2001

**AWARDS AND HONORS**

Outstanding Student Paper Award, AGU Biogeosciences Section		Fall 2003
Outstanding Answerer Award, Scienceline, UCSB		Spring 2003
NASA Earth System Science Fellowship		F 2000-Sp 2003
Travis Dixon Service Award, Graduate Students Association, UCSB		Spring 2001
Honors in Geology-Physics Math, Brown University		Spring 1996
Sigma Xi Scientific Research Society		Spring 1996
Undergraduate Teaching and Research Assistantship, Brown University		Spring 1995