

Toby R. Ault

- CONTACT INFORMATION** Department of Geoscience office: (520) 626 3570
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Tucson, AZ, 85719 e-mail: tault@email.arizona.edu
- RESEARCH INTERESTS** Decadal to multidecadal climate variability, North American hydroclimate, global and regional climate modeling, paleoclimatology, paleoclimate process modeling, and phenoclimatology.
- EDUCATION**
- University of Arizona**
- PhD Candidate in Geoscience* **2006-present**
- Advisors: Dr. Julia E. Cole & Dr. Jonathan T. Overpeck
 - Dissertation: The spectrum of North American drought: red, white, or blue? Integrating paleoclimate data with global climate model simulations to understand megadroughts.
 - Expected Defense Date: 5/6/2011
- University of Arizona**
- M.S. in Geoscience* **2004-2006**
- Advisor: Dr. Julia E. Cole
 - Thesis: A new synthesis of coral records to evaluate spatiotemporal characteristics of decadal variability.
- University of Puget Sound**
- B.S. in Mathematics (Minor in Spanish)* **1998-2002**
- Major Advisor: Dr. Sigrun Bodine
- FELLOWSHIPS AND HONORS**
- College of Science Outstanding Scholarship Award (2010)**, Univ. Arizona.
- William G. McGinnies Graduate Scholarship (2010)**, Dept. of Arid Lands, Univ. Arizona.
- Best Paleoclimate Talk (2010)**, GeoDaze Symposium, Dept. of Geosciences, Univ. Arizona.
- Invited Participant in International Conference on Peatland Dynamics (2009)**, Vihula Estate, Estonia.
- Galileo Circle Scholarship (2008)**, Galileo Foundation, Univ. Arizona.
- National Science Foundation Graduate Research Fellowship (2006-2009)**
- Sultzter Earth Science Scholarship (2005)**, Dept. of Geosciences, Univ. of Arizona, AZ.
- Watson Fellowship (2002-2003)**, Watson Foundation. Used to complete one year of travel retracing Darwin's journey through Brazil, Uruguay, Argentina, Chile, the Galapagos, Tahiti, New Zealand, Australia, and England.
- GRANTS AND AWARDS**
- IoE Travel Grant (2010)**, for travel to AGU Fall Conference.
- Maxwell Short Scholarship (2010)**, Dept. of Geosciences, Univ. Arizona.
- ISPE Travel Grant (2009)**, presentation at 2009 PACLIM Conference.
- ISPE Travel Grant (2008)**, for attendance of Fall 2008 CLIVAR Conference in Lincoln, NE.
- GSA Graduate Research Grant (2008)**, to develop a new $\delta^{18}O$ record from an Arizona cave.
- GPSC Graduate Student Travel Award (2007)**, for travel to 2007 AGU Fall Conference.
- Bert S. Butler Scholarship (2007)**, to attend 12th annual CCSM conference, Breckenridge, CO.
- Bert S. Butler Scholarship (2005)**, for research on inorganic calcite effects on coral $\delta^{18}O$ sea surface temperature reconstructions.

Refereed Publications

St. George, S. and T.R. **Ault** (*accepted*): Is strong decadal variability along the central Pacific Coast of the United States evidence of a low-frequency signal or a product of atmospheric noise? *Journal of Geophysical Research*.

Ault, T.R., A. Macalady, G.T. Pederson, J. Betancourt, M. Schwartz (*in pres*): Northern Hemisphere modes of variability and the timing of spring in western North America. *Journal of Climate*.

Pederson, G.T., S.T. Gray, T.R. **Ault**, W. Marsh, D.B. Fagre, A.G. Bunn, C. Woodhouse, and L.J. Graumlich (*in press*): Climatic controls on the snow melt hydrology of the northern Rocky Mountains, USA. *Journal of Climate*.

Truebe, S., T.R. **Ault** and J. E. Cole (2010): A forward model of cave drip-water $\delta^{18}O$ and application to speleothem records. *IOP Conference Series: Earth and Environmental Science*, Vol. 9, 012022, doi: 10.1088/1755-1315/9/1/012022.

Ault, T.R. and S. St George (2010): The magnitude of decadal and multi-decadal variability in North American precipitation. *Journal of Climate* 23(4): 842-850.

Ault, T.R., J. E. Cole, M. N. Evans, H. Barnett, N.J. Abram, A.W. Tudhope, B.K. Linsley (2009): Intensified decadal variability in tropical climate during the late 19th century. *Geophysical Research Letters*, 36, L08602, 10.1029/2008GL036924.

Damassa, T. D., Cole, J. E., Barnett, H. R., **Ault**, T. R. and McClanahan, T. R. (2006): Enhanced multidecadal climate variability in the seventeenth century from coral isotope records in the western Indian Ocean. *Paleoceanography* 21, 15.

PUBLICATIONS

Manuscripts in Preparation (available upon request)

McCabe, G., T.R. **Ault**, B. Cook, J. Betancourt, and M.D Schwartz (*submitted*): Influences of ENSO and PDO on the Timing of North American Spring. *International Journal of Climatology*.

Ault, T. R., J. E. Cole, A. Kimbrough, and S. Truebe (*in preparation*): Monte Carlo age models and their application to a new $\delta^{18}O$ record from a southern Arizona cave.

Ault, T.R., G.T. Pederson, J. E. Cole, J.T. Overpeck, D. Meko, (*in preparation*): A new framework for assessing megadrought risk during the 21st century.

Ault, T.R., J.E. Cole, G.T. Pederson, J.T. Overpeck, S. St. George, B. Otto-Bliesner, C. Deser, and C. Woodhouse (*in preparation*): The continuum of North American drought—a proxy-model comparison.

Thompson, D.M., T.R. **Ault**, M.N. Evans, J.E. Cole, and J. Emile-Geay (*in preparation*) Inter-comparison of 20th century global climate model simulations and coral $\delta^{18}O$ data using a forward proxy model.

PROFESSIONAL EXPERIENCE

University of Arizona, College of Science, Tucson, AZ

Instructor: Matlab Basics for Graduate Students

2007-2009

Designed and taught a Matlab course that was tailored to the needs of graduate students in different departments of the College of Science. The course was offered once per year to give graduate students essential Matlab skills. The topics covered included: basic principles of algorithm design, figure and map making, matrix operations and inverse methods, spectral analysis, and statistics.

National Center for Atmospheric Research (NCAR), Boulder, CO

Visiting Graduate Student Researcher

Summer - 2007,2008

Hosted by Dr. Bette Otto-Bliesner to analyze output from several 20th century and paleoclimate simulations run by the climate variability and paleoclimate modeling groups at NCAR. Results from this collaboration have been used in two manuscripts comparing droughts in climate models with droughts inferred from proxy records.

ConocoPhillips, Houston, TX

Geophysics Technology Group Intern

Summer - 2006

For a given seismic profile, there exists a number of possible sequences of rock layers that could have generated that profile. I worked on a Monte Carlo forward model designed to constrain the total number of these possibilities from a few million to a few hundred. A similar problem arises in the analysis of certain paleoclimate data because a number of unique climates could have produced a given record, and many of the insights from this internship have been applied to my PhD thesis.

University of Arizona, Dept. of Geoscience, Tucson, AZ

Teaching Assistant: Ocean Science

Spring, 2005

University of Arizona, Dept. of Geoscience, Tucson, AZ

Teaching Assistant: Geologic Perspective

Fall, 2004

Portland Community College, Portland, OR

Math and Statistics Tutor

2003-2004

University of Puget Sound, Tacoma, WA

Calculus, Differential Equations, and Linear Algebra Tutor

2001-2002

SERVICE AND
OUTREACH

CREST Symposium (2009), Keynote Speaker, West Linn High School, West Linn, OR.

Swashbuckling Scientists (2009), Presentation on Darwin's travels for Junior High Students.

On the Trail of Darwin's Megabeasts (2009), Article published in *American Paleontologist*.

GeoDaze Symposium, Co-chair (2004-2005) and webmaster (2005-2006).

TECHNICAL
SKILLS

Matlab, Unix, NCL, Fortran, L^AT_EX and Emacs. I also have experience running NCAR's Weather Research and Forecast Model (WRF) and a mass spectrometer.

REFERENCES

Dr Julia E. Cole
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Dr Julio J. Betancourt
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