JORDAN TYLER ABELL

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EDUCATION

M.Phil., Earth and Environmental Sciences, Columbia University, New York City, NY (02/2020)

Thesis: *East Asian and North Pacific Climate System through the Plio-Pleistocene*
Thesis Advisor: Dr. Gisela Winckler

M.A., Earth and Environmental Sciences, Columbia University, New York City, NY (05/2018)

Thesis: *Reconstructing dust and productivity in the western North Pacific during the Plio-Pleistocene: East Asian dustiness and the onset and intensification of Northern Hemisphere Glaciation.*
Thesis Advisors: Dr. Gisela Winckler and Dr. Robert Anderson

B.S., Geosciences (Geology Emphasis) *Cum Laude*, University of Arizona, Tucson, AZ (08/2016)

Thesis: *Evidence of Urine in a Neolithic Tell in Relation to Animal Domestication*.
Primary Thesis Advisor: Dr. Jay Quade

RESEARCH EXPERIENCE

2016 – 2021 **Research Assistant**, Isotope Geochemistry Laboratory, Geochemistry Division, Lamont-Doherty Earth Observatory, Columbia University

2015 – 2016 **Research Assistant**, Biogeochemistry Modeling Laboratory, Department of Geosciences, University of Arizona

2015 – 2016 **Research Assistant**, Soil Chemistry Laboratory, Department of Geosciences, University of Arizona

2014 – 2016 **Laboratory Manager**, Geochronology Sample Preparation Laboratory, Department of Geosciences, University of Arizona

2013 – 2016 **Research Assistant**, Geochronology Sample Preparation Laboratory, Department of Geosciences, University of Arizona

CURRENT RESEARCH PROJECTS

- Reconstructing atmospheric, oceanic, and land surface conditions in East Asia and North Pacific Ocean during the Mio-Plio-Pleistocene.
- Understanding the effect of geomorphology on wind and dust emission history of East Asian stony deserts.

- Using geochemical and isotopic signatures of human and animal occupations at Aşıkı Höyük to understand Neolithic lifestyles.
- Applying iron speciation of detrital material in marine sediments as a proxy for dust provenance and glaciation signal.
- Exploring the use of bulk sample water-soluble and acid-leachable elemental composition at Blombos Cave and Diepkloof Rock Shelter in South Africa.
- Characterizing the bulk sample water-soluble and acid-leachable elemental composition of a 17th century mission coral in southern Arizona: Quantifying animal inputs.

PEER REVIEWED PUBLICATIONS

Published and accepted manuscripts

1. Zhang, D., Wang, G., Pullen, A., **Abell, J. T.,** Ji, J., and Shen, T. (2020). Landscape evolution and development of low albedo eolian-modified unconsolidated gravel surfaces and yardangs in the Hami Basin, NW China. *Geomorphology*.
2. **Abell, J. T.,** Pullen, A., Lebo, Z., Kapp, P., Gloege, L., Metcalf, A., Nie, J., and Winckler, G. (2020). A wind albedo-wind feedback driven by landscape evolution. *Nature Communications*, doi.org/10.1038/s41467-019-13661-w
3. **Abell, J. T.**, Quade, J., Duru, G., Mentzer, S. M., Stiner, M. C., Uzdurum, M., and Özbaşaran, M. (2019). Urine salts elucidate Early Neolithic animal management at Aşıklı Höyük, Turkey. *Science Advances*, doi.org/10.1126/sciadv.aaw0038.
4. Pelletier, J. D., Kapp, P. A., **Abell, J.,** Field, J. P., Williams, Z. C., and Dorsey, R. J. (2018). Controls on yardang development and morphology I. Field observations and measurements at Ocotillo Wells, California. *Journal of Geophysical Research: Earth Surface***,** doi.org/10.1002/2017JF004461.
5. Licht, A., Dupont-Nivet, G., Pullen, A., Kapp, P., Abels, H., Lai, Z., Guo, Z., **Abell, J.**, and Giesler, N. (2016). Resilience of the Asian atmospheric circulation shown by Paleogene dust provenance. *Nature Communications*, doi.org/10.1038/ncomms12390.
6. Licht, A., Pullen, A., Kapp, P., **Abell, J.**, and Giesler, N. (2016). Eolian cannibalism: reworked loess and fluvial sediment as the main sources of the Chinese Loess Plateau. *GSA Bulletin*, doi.org/10.1130/B31375.1.

Manuscripts in review

1. **Abell, J. T.,** Winckler, G., Anderson, R. F., and Herbert, T. D., Shifting and strengthening westerlies across the Plio-Pleistocene Transition. (in review at *Nature*).

Manuscripts in circulation among co-authors (available upon request)

1. Zhang, H., Nie, J., **Abell, J. T.,** Clinkscales, C., Pullen, A., Garzione, C., Breecker, D., Winckler, G., Peng, W., Ren, X., Herbert, T. D., and Tarduno, J., Volcanic forcing of Late Miocene–Pliocene climatic and environmental variations. (for submission to *Science*)
2. **Abell, J. T.,** Rahimi, S., Lebo, Z., Pullen, A., Gloege, L., Zhang, D., and Winckler, G., Impacts of wind erosion on dust production through the Pleistocene in the Hami Basin, China. (for submission to *Geophysical Research Letters*)
3. Zhang, D., Wang, G., **Abell, J. T.,** and Pullen, A., The paradox of the Hami Basin, China: fast winds, high erosion rates, but low dust production. (for submission to *Geology*)

Manuscripts in preparation

1. **Abell, J. T.,** Shoenfelt-Troein, E. M., Winckler, G., and Anderson, R. F., North Pacific Iron Speciation in Marine Sediment Cores: Spatial-Temporal Variability. (for submission to *Earth and Planetary Science Letters*)

NON-REFEREED PUBLICATIONS

1. **Abell, J.**, Kapp, P., Pullen, A., and Licht, A., Geochronology of zircons in Loess Plateau, Ordos Basin, and central sand deserts for comparative statistical analyses: *Spirit of Inquiry*, 2015. (Local University of Arizona science booklet)

INVITED PRESENTATIONS

May 2020 Biology and Paleo-Environment Seminar, Lamont-Doherty Earth Observatory, *Invited Talk*

February 2020 Clemson University Environmental Engineering and Earth Sciences Seminar, *Invited Talk*

July 2018 RV SONNE Scientific Cruise Meeting, *Invited Talk*

August 2017 Asikli Hoyuk Summer Field Campaign, *Invited Talk*

CONFERENCE PROCEEDINGS/ACADEMIC TALKS (*Presenting Author):

1. **Abell, J. T.***, Winckler, G., Anderson, R. F., Herbert, T. D. Reconstructing the intensity and location of Northern Hemisphere westerlies during the Plio-Pleistocene using marine sediments. *EGU*, 2020. (Talk)

2. Pullen, A., **Abell, J. T.*,** Lebo, Z., Kapp, P., Gloege, L., Metcalf, A., Nie, J., and Winckler, G. When geology and climate collide: evolving landscapes and the wind-albedo wind feedback. *AGU*, 2019. (Talk)

3. Pavia, F. J.*, **Abell, J. T.,** Winckler, G., and Anderson, R. F. Reconstruction of Modern Dust Deposition in the South Pacific from Water Column and Sedimentary Methods. *AGU*, 2019. (Poster)

4. **Abell, J. T.***, Winckler, G., Anderson, R. F. East Asian Dust Fluxes and Paleoproductivity in the North Pacific during the Plio-Pleistocene. *AGU*, 2019. (Poster)

5. Garzione, C. N.*, Weber, T. S., Lauderdale, J. M., Nie, J., Pullen, A., An, Z., **Abell., J. T.**, Winckler, G., Anderson, R. F., Herbert, T., Lu, H., and Molnar, P. H. Asian Tectonics, the Fe Hypothesis for the North Pacific, and Late Cenozoic Cooling. *AGU*, 2019. (Talk)

6. **Abell, J**.*, Winckler, G., and Anderson, R. F., Do Changes in Dust Flux to the North Pacific Correspond to Major Climate Shifts in the Pliocene? *AGU*, 2017. (Poster)

7. **Abell, J.***, Winckler, G., and Anderson, R. F., Reconstructing Dust Flux and Export Productivity in the North Pacific to Understand Pliocene Climate Change: *PIRE Dust Conference*, 2017.

(Poster)

8. **Abell, J.***, Winckler, G., and Anderson, R. F., Reconstructing Dust Flux and Export Productivity in the North Pacific to Understand Pliocene Climate Change: *Lamont-Doherty First-Year Colloquium,* 2017 (Talk)

9. **Abell, J.***, Quade, J., Stiner, M., Mentzer, S., and Osbasaran, M., Evidence of urine in a Neolithic tell in relation to animal domestication: *University of Arizona GeoDaze Symposium,* 2016. (Talk*)*

10. **Abell, J.***, Russell, J., and Goodman, P., Observationally-Based Data/Model Metrics from the Southern Ocean Climate Model Atlas: *University of Arizona GeoDaze Symposium*, 2016. (Poster)

11. Licht, A.*, Dupont-Nivet, G., Pullen, A., Kapp, P., Abels, H., **Abell, J.**, and Gielser, N., Resilience of the Asian atmospheric circulation to paleogeographic and climatic changes: *EGU*, 2016. (Poster)

12. Licht, A.*, Pullen, A., Kapp, P., **Abell, J.**, and Giesler, N., Reworked loess and Yellow River sediment as the main sources of the Chinese Loess Plateau: *EGU*, 2016. (Talk)

13. **Abell, J.***, Russell, J., and Goodman, P., Observationally-Based Data/Model Metrics from the Southern Ocean Climate Model Atlas: *AGU*, 2015. (Poster)

14. **Abell, J.***, Quade, J., Stiner, M., Mentzer, S., and Osbasaran, M., Evidence of urine in a Neolithic tell in relation to animal domestication: *GSA*, 2015. (Poster)

15. Licht, A.*, Pullen, A., Kapp, P., **Abell, J.**, and Giesler, N., Sources of the Quaternary Chinese Loess Plateau strata based on U-Pb detrital zircon ages: implications for atmospheric circulation and internal recycling of the Loess Plateau: *The Batsheva de Rothschild Seminar on Dust, Loess, and Soils in Deserts and Desert Margins*, 2015 (Poster)

16. **Abell, J.***, Kapp, P., Pullen, A., and Licht, A., Geochronology Study of the Loess Plateau for Comparative Statistical Analyses and its Effects on Asian Paleoclimate: *3rd Annual Doug Shakel Memorial Student Poster Event*, 2015. (Poster)

17. **Abell, J.***, Kapp, P., Pullen, A., and Licht, A., Geochronology Study of the Loess Plateau for Comparative Statistical Analyses and its Effects on Asian Paleoclimate: *University of Arizona GeoDaze Symposium*, 2015. (Poster)

18. Licht, A.*, Kapp, P., Pullen, A., **Abell, J.**, Abels, H., and Dupont-Nivet, G., Tracking the provenance of the dust deposits on the Chinese Loess Plateau through U-Pb dating of aeolian zircons: insights from large-*n* geochronological datasets: *EGU*, 2015. (Poster)

19. **Abell, J.***, Kapp, P., Geochronology of zircons in Loess Plateau, Ordos Basin, and central sand deserts for comparative statistical analyses: *University of Arizona Honor's Research Exposition*, 2015. (Poster)

20. Licht, A.*, Adriens, R., Pullen, A., Kapp, P., Abels, H., van Cappelle, M., **Abell, J.**, Vanderbenghe, J., and Dupont-Nivet, G., Asian Winter monsoons in the Eocene? Evidence from the Aeolian dust series of the Xining basin: *AGU*, 2014. (Poster)

21. **Abell, J.***, Bowers, J., Carroll, J., Lunn, E., Valachovic, J., and Kapp, P., Wind over rock:

Quantifying the structure and geometrics of 'yardangs': *University of Arizona GeoDaze Symposium*, 2014. (Poster)

GRANTS, HONORS, AND AWARDS

2020	GSA Graduate Student Research Grant ($1.3K)
2020	Outstanding Student Presentation Award, American Geophysical Union Annual Meeting, 2019
2018 – 2020	Climate Center Grant, Lamont-Doherty Earth Observatory ($10K)
2016	Lyle Award in Tectonics and Geodynamics, University of St. Andrews
2016 – 2021	Columbia Graduate School of Arts and Sciences Dean's Fellow, Columbia University
2016	Excellence in Undergraduate Research Department Award, College of Science, University of Arizona
2016	Best Undergraduate Talk, *The Doug Shakel Memorial Award*, GeoDaze Symposium, University of Arizona
2015 – 2016	UA/NASA Space Grant Undergraduate Research Internship (Research funded for 1 year)
2013 – 2016	Dean's List, University of Arizona
2015	Arizona Geological Society, Student Poster Award, Arizona State University
2015	Galileo Circle Scholar, College of Science, University of Arizona ($1K)
2013 – 2014	Honor's College Research Grant, University of Arizona ($1.5K)
2012 – 2016	Wildcat Excellence Scholarship

TEACHING EXPERIENCE

2020 **Co-Coordinator and Guest Lecturer**, Chemistry of Continental Waters (Graduate/Undergraduate), Department of Earth and Environmental Sciences, Columbia University

- Assisted in coordinating the second half of the Spring 2020 semester. Taught 5 lectures on aerosol chemistry, weathering and soil formation, and chemistry of rivers.

2018 **Teaching Assistant**, Terrestrial Paleoclimate (Graduate/Undergraduate), Department of Earth and Environmental Sciences, Columbia University

- Led 2 lectures, graded problem sets, was responsible for leading 20-minute recitations at end of lectures, assisted in grading of exams

2018 **Teaching Assistant**, Climate Systems (Undergraduate), Department of Earth and Environmental Sciences, Columbia University

- Led 2 lectures, responsible for teaching weekly 3-hour laboratory session, graded laboratory write-ups

2017 **Teaching Assistant**, Solid Earth Systems (Undergraduate), Department of Earth and Environmental Sciences, Columbia University
- Responsible for teaching weekly 3-hour laboratory session, graded laboratory write-ups

2016 **Preceptor**, Igneous and Metamorphic Petrology (Undergraduate), Department of Geosciences, University of Arizona
- Assisted lead TA in leading 3-hour weekly laboratory session, graded lab write-ups

2015 **Preceptor**, Physical Geology, Department of Geosciences, University of Arizona
- Assisted lead TA in leading 3-hour weekly laboratory session, graded lab write-ups

FIELD AND CRUISE EXPERIENCE

2017 – Present Asikli Hoyuk Field Site, Turkey. Archaeological mapping and sampling for geochemical

2018 Geochemist aboard the RV SONNE: Sediment coring, core preparation and description

2017 Chinese Loess Plateau, Geologic mapping

2016 Geology Field Camp, University of St. Andrews, Scotland

2014 Ocotillo Wells, CA. Geologic mapping and structural analysis of 'yardangs'

2013 Anza Borrega, CA. Geological mapping and sedimentological analysis

PROFESSIONAL SERVICE, SCIENCE OUTREACH, AND MENTORING

2019 – Present Manuscript Reviewer: Geophysical Research Letters; Quaternary Science Reviewers

2016 – Present Volunteer, Lamont-Doherty Earth Observatory Open House

2014 – 2016 Guest Coordinator, Society of Earth Science Students, University of Arizona

2014 – 2016 Coordinator of Kid's Corner, Tucson Gem and Mineral Show

2014 – 2016 Undergraduate Co-coordinator for Science Center, Tucson Festival of Books

2015 Local Middle School Science Fair Judge, Tucson, AZ

PROFESSIONAL AFFILIATIONS

2019 – Present International Society for Aeolian Research
2015 – Present American Geophysical Union
2015 – Present Geological Society of America

2013 – 2016 Arizona Geological Society

ADDITIONAL RELEVANT EXPERIENCE

2013 Intern at GeoDecor Fossil Preparatory Lab

- Worked on taking rock slabs from the Green River area in Wyoming and then would prepare the fossils, ranging from dinosaurs to fish, present in the sediments for sale using air abrasion systems.

SKILLS/ANALYTICAL TECHNIQUES

1) Running a MAP-215 Noble Gas Mass Spectrometer
2) Chemical preparation for helium isotope, uranium/thorium isotope, and REE analyses
3) Preparation for zircon geochronology (crushing, water tabling, panning, frantzing, heavy liquid separation, mounting/epoxy, polishing).
4) Scanning Electron Microscope
5) Laser Ablation - Inductively Coupled Plasma - Mass Spectrometry (LA-ICP-MS)
6) Soil preparation for ICP-MS and IC analysis
7) NOAA's Ferret Plotting Software for IPCC/CMIP5 Climate Model Data Analysis
8) Python/Matlab Coding Software
9) Experience running WRF forecasting model