DEBORAH KHIDER

PERSONAL INFORMATION

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EDUCATION

2006–2011 University of Southern California

PhD

GPA: 4.0 · Ocean Sciences
Thesis: *Paleoceanography of the Indonesian Seas over the last 25,000 years*
Advisors: Dr. Lowell D. Stott & Dr. Julien Emile-Geay

2004–2006 University of Southern California

Bachelor of Science

GPA: 3.82 · *Environmental Engineering*
Graduated *Magna cum laude*, Presidential Scholar

2001–2005 Hawaii Pacific University

Bachelor of Science

GPA: 3.93 · *Oceanography and Applied Mathematics*
Graduated *Magna cum laude*

RESEARCH EXPERIENCE

University Of Southern California

2018-present Data Scientist, Information Sciences Institute
Research focused on using artificial intelligence in the (paleo)geosciences

2018 Postdoctoral Scholar, Information Sciences Institute
MINT: Model Integration through Knowledge-Rich Data and Process Composition
Supervisor: Dr. Yolanda Gil

2016–2017 Postdoctoral Scholar, Earth Sciences
LinkedEarth: Crowdsourcing data curation and standards development in paleoclimatology.
Supervisor: Dr. Julien Emile-Geay

University Of California, Santa Barbara

2013–2015 Postdoctoral Scholar, Earth Sciences
Probabilistic age modeling of paleoceanographic data.
Supervisor: Dr. Lorraine Lisiecki

2011–2013 Postdoctoral Fellow, Institute for Geophysics

The University of Texas at Austin

Uncertainty quantification of paleoclimatic records and forward modeling of climate proxies using Bayesian Inference.
Supervisors: Dr. Charles Jackson and Dr. Terrence M. Quinn

TEACHING EXPERIENCE

University Of Southern California

2019-present Lecturer, Informatics

DSCI549: Introduction to Computational Thinking and Data Science
DSCI560: Data Science Professional Practicum

University Of Utah

2016-2018 Guest Lecturer, SPATIAL Short Course

Lecture on Data Management in the geosciences.

University Of California, Santa Barbara

Fall 2015 Lecturer, Earth Sciences

EARTH130 – Global Warming: Science and Society.
Introduction to the scientific and societal issues surrounding global climate change.

PUBLICATION RECORD

Journal Articles

Kaufman, D.; McKay, N.; Routson, C.; Erb, M.; Davis, B.; Heiri, O.; Jaccard, S.; Tierney, J.; Dätwyler, C.; Axford, Y.; Brussel, T.; Cartapanis, O.; Chase, B.; Dawson, A.; de Vernal, A.; Engels, S.; Jonkers, L.; Marsicek, J.; Moffa-Sánchez, P.; Morrill, C.; Orsi, A.; Rehfeld, K.; Saunders, K.; Sommer, P. S.; Thomas, E.; Tonello, M.; Tóth, M.; Vachula, R.; Andreev, A.; Bertrand, S.; Biskaborn, B.; Bringué, M.; Brooks, S.; Caniupán, M.; Chevalier, M.; Cwynar, L.; Emile-Geay, J.; Fegyveresi, J.; Feurdean, A.; Finsinger, W.; Fortin, M.; Foster, L.; Fox, M.; Gajewski, K.; Grosjean, M.; Hausmann, S.; Heinrichs, M.; Holmes, N.; Ilyashuk, B.; Ilyashuk, E.; Juggins, S.; **Khider, D.**; Koinig, K.; Langdon, P.; Larocque-Tobler, I.; Li, J.; Lotter, A.; Luoto, T.; Mackay, A.; Magyari, E.; Malevich, S.; Mark, B.; Massaferro, J.; Montade, V.; Nazarova, L.; Novenko, E.; Pařil, P.; Pearson, E.; Peros, M.; Pienitz, R.; Płóciennik, M.; Porinchu, D.; Potito, A.; Rees, A.; Reinemann, S.; Roberts, S.; Rolland, N.; Salonen, S.; Self, A.; Seppä, H.; Shala, S.; St-Jacques, J.; Stenni, B.; Syrykh, L.; Tarrats, P.; Taylor, K.; van den Bos, V.; Velle, G.; Wahl, E.; Walker, I.; Wilmshurst, J.; Zhang, E.; and Zhilich, S. (2020). A global database of Holocene paleotemperature records. *Scientific Data*, 7(1): 115.

Khider, D., J. Emile-Geay, N.P. McKay, Y. Gil, D. Garijo, V. Ratnakar, M. Alonso-Garcia, S. Bertrand, O. Bothe, P. Brewer, A. Bunn, M. Chevalier, L. Comas-Bru, A. Csank, E. Dassie, K. DeLong, T. Felis, P. Francus, A. Frappier, W. Gray, S. Goring, L. Jonkers, M. Kahle, D. Kaufman, N. M. Kehrwald, B. Martrat, H. McGregor, J. Richey, A. Schmittner, N. Scroxton, E. Sutherland, K. Thirumalai, K. Allen, F. Arnaud, Y. Axford, T. T. Barrows, L. Bazin, S.E. Pilaar Birch, E. Bradley, J. Bregy, E. Capron, O. Cartapanis, H.-W. Chiang, K. M. Cobb, M. Debret, R. Dommain, J. Du, K. Dyez, S. Emerick, M. P. Erb, G. Falster, W. Finsinger, D. Fortier, Nicolas Gauthier, S. George, E. Grimm, J. Hertzberg, F. Hibbert, A. Hillman, W. Hobbs, M. Huber, A.L.C. Hughes, S. Jaccard, J. Ruan, M. Kienast, B. Konecky, G. Le Roux, V. Lyubchich, V.F. Novello, L. Olaka, J.W. Partin, C. Pearce, S.J. Phipps, C. Pignol, N. Piotrowska, M.-S. Poli, A. Prokopenko, F. Schwanck, C. Stepanek, G. E. A. Swann, R. Telford, E. Thomas, Z. Thomas, S. Truebe, L. von Gunten, A. Waite, N. Weitzel, B. Wilhelm, J. Williams, J.J. Williams, M. Winstrup, N. Zhao, Y. Zhou (2019).

PaCTS 1.0: A Crowdsourced Reporting Standard for Paleoclimate Data. *Paleoceanography and Paleoclimatology*, doi:10.1002/2019PA003632.

Zhu, F., J. Emile-Geay, T.R. Ault, N. McKay, G. Hakim, **D. Khider**, E.J. Steig, S. Dee, J.W. Kirchner. (2019) Climate models can correctly simulate the continuum of temperature variability. *Proceedings of the National Academy of Sciences of the United States of America*. doi:10.1073/pnas.1809959116.

Richey, J., K. Thirumalai, **D.Khider**, C. Reynolds, J. Partin, T. Quinn. (2019) Considerations for *Globigerinoides ruber* (white and pink) paleoceanography in the Atlantic Ocean: comprehensive insights from a long-running sediment trap. *Paleoceanography and Paleoclimatology*. doi:10.1029/2018PA03417.

Khider, D., S. Ahn, L. Lisiecki, C. Lawrence, M . Kienast. (2017) The role of uncertainty in estimating lead/lag relationships in marine sedimentary archives: A case study from the tropical Pacific. *Paleoceanography*. doi:10.1002/2016PA003057.

Ahn, S., **D. Khider**, L. Lisieicki, C. Lawrence. (2017) A probabilistic Pliocene-Pleistocene stack of benthic δ^{18}O using a profile hidden Markov model. *Dynamics and Statistics of the Climate System*. doi:10.1093/climsys/dzx002.

Tems, C., W. Berelson, R. Thunell, E. Tappa, X. Xu, **D. Khider**, S. Lund, O. Gonzalez-Yajimovich. (2016) Sedimentary δ^{15}N reveal decadal fluctuations in the intensity of the eastern tropical north Pacific oxygen minimum zone during the last 1200 years. *Paleoceanography*. doi:10.1002/2015PA002904.

Khider, D., G. Huerta, C. Jackson, L. Stott, J. Emile-Geay. (2015). A Bayesian, multivariate regression for *Globigerinoides ruber* Mg/Ca. *Geochemistry, Geosphysics, Geosystems*. doi:10.1002/2015GC005844

Lin, L., **D. Khider**, L. Lisiecki, C. Lawrence. (2014). Probabilistic sequence alignment of stratigraphic records. *Paleoceanography*. doi:10.1002/2014PA002713

Khider, D., C. Jackson, L. Stott. (2014). Assessing millennial-scale variability during the Holocene: a western tropical Pacific perspective. *Paleoceanography*. doi:10.1002/2013PA002534

Khider, D., L. Stott, J. Emile-Geay, R. Thunell, D. Hammond. (2011). Assessing El Niño Southern Oscillation variability during the past millennium. *Paleoceanography*. doi:10.1029/2011PA002139

Reuter, J., L. Stott, **D. Khider**, A. Sinha, H. Cheng, R. Edwards. (2009). A new perspective on the hydroclimate variability in northern South America during the Little Ice Age. *Geophysical Research Letters*. doi:10.1002/2009GL041051

Peer-Reviewed Conference Papers

Garijo, D., D.Khider, V. Ratnakar, Y. Gil, E. Deelman, R.F. da Silva, C. Knoblock, Y. Chiang, M. Pham, J. Pujara, B. Vu, D. Feldman, R. Mayani, K. Cobourn, C. Duffy, A. Kemanian, L. Shu, V. Kumar, A. Khandelwal, A., K. Tayal, S. Peckham, M. Stoica, A. Dabrowski, D. Hardesty-Lewis, S. Pierce. An intelligent interface for Integrating Climate, Hydrology, Agriculture, and Socioeconomic mocels. *Proceedings of the 24th International Conference on Intelligent User Interfaces: Companion, of IUI '19*.

Gil, Y., K. Cobourn, E. Deelman, C. Duffy, R. Ferreira da Silva, A. Kemanian, C. Knoblock, V. Kumar, S. Peckham, L. Carvalho, Y.-Y. Chiang, D. Garijo, **D. Khider**, A. Khandelwal, M. Pahm, J. Pujara, V. Ratnakar, M. Stoica, B. Vu. (2018) MINT: Model Integration Through Knowledge-Powered Data and Process Composition. *Proceedings of Modelling for Sustainable Food-Energy-Water Systems: 9th International Congress on Environmental Modelling and Software*.

D. Garijo, **D. Khider**, Y. Gil, L. Carvalho, B. Essawy, S. Pierce, D. H. Lewis, V. Ratnakar, S. Peckham, C. Duffy, J. Goodall. (2018) A semantic model catalog to support composition and reuse. *Proceedings of Modelling for Sustainable Food-Energy-Water Systems: 9th International Congress on Environmental Modelling and Software*.

Gil, Y., D. Garijo, V. Ratnakar, **D. Khider**, J. Emile-Geay, N. McKay. (2017). A controlled crowdsourcing approach for practical ontology extensions and metadata annotations. In d'Amato C. et al. (eds) The Semantic Web - ISWC2017. ISWC2017. Lecture Notes in Computer Science, vol 10588. Springer, Cham.

Articles in Refereed Workshops

Khider, D., Athreya, P.; Ratnakar, V.; Gil, Y.; Zhu, F.; Kwan, M.; Emile-Geay, J. (2020) Towards Automating Time Series Analysis for the Paleogeosciences. In MileTS '20: 6th KDD Workshop on Mining and Learning from Time Series, August 24th, 2020, San Diego, California, USA. ACM, New York, NY, USA, 6 pages.

Khider, D. P. Athreya, V. Ratnakar, Y. Gil, F. Zhu, M. Kwan, and J. Emile-Geay. 2020. Towards Automating Time SeriesAnalysis for Paleogeosciences. *InMileTS '20: 6th KDD Workshop on Mining and Learning from Time Series*, August 24th, 2020, San Diego, California, USA.ACM, New York, NY, USA, 6 pages

Khider, D., L. Stott, R. Saikku, J. Partin, C. Jackson, D. Hammond, A. Newton, R. Thunell. (2013). How unusual is the 20th century within the Indo-Pacific Warm Pool? *The Third International Workshop on Climate Informatics*, Boulder, CO.

Conference Abstracts

Khider, D., F. Zhu, Y. Gil (2019). autoTS: Automated Machine Learning for Time Series Analysis. *AGU Fall Meeting*, San Francisco, CA.

Khider, D. et al. (2019) MINT: An intelligent interface for understanding the impacts of climate change on hydrological, agricultural and economic systems. *AGU Fall Meeting*, San Francisco, CA.

Khider, D., Y. Gil. (2018). AI in geosciences: progress, challenges, and opportunities. *AGU Fall Meeting*, Washington, D.C. (Invited)

Khider, D., N. McKay, J. Emile-Geay, D. Garijo, Y. Gil, V. Ratnakar. (2018). Supporting paleoclimate research with the FAIR principle: lessons from LinkedEarth. *AGU Fall Meeting*, Washington, D.C.

Zhu, F., J. Emile-Geay, T. Ault, N. McKay, G.J. Hakim, **D. Khider**, E.J. Steig, S. Dee, J.W. Kirchner. (2018) Climate models can correctly simulate the continuum of temperature variability. *AGU Fall Meeting*, Washington, D.C.

Garijo, D., Y. Gil, K.M. Cobourn, E. Deelman, C. Duffy, R. Ferreira de Silve, A. Kermanian, C. Knolblock, V. Kumar, S. Peckham, Y.-Y. Chiang, **D. Khider**, A. Khandelwal, J. Pujara, V. Ratnakar, M. Stoica, M. Pham, B. Vu. (2018) Integrating models through knowledge-powered data and process composition. *AGU Fall Meeting*, Washington, D.C.

McKay, N, J. Emile-Geay, **D. Khider**. (2018) Scientific workflows, reproducibility and uncertainty quantification in the paleogeosciences. *AGU Fall Meeting*, Washington, D.C.

Khider, D., J. Emile-Geay, N. McKay, D. Garijo, Y. Gil, V. Ratnakar (2018). LinkedEarth: Supporting paleoclimate research with crowdsourced ontologies, software, and data standards. *EarthCube All Hands Meeting, Washington, D.C.*

Khider, D., J. Emile-Geay, N. McKay, D. Garijo, V. Ratnakar, Y. Gil, F. Zhu (2017). LinkedEarth and 21st century paleoclimatology: reducing data friction through standard development. *AGU Fall Meeting*, New Orleans, LA. Abstract IN32A-03 (Invited)

Khider, D., J. Emile-Geay, N. McKay, C.S. Jackson, C. Rouston (2016). Testing the Millennial-Scale Holocene Solar-Climate Connection in the Indo-Pacific Warm Pool. *AGU Fall Meeting*, San Francisco, CA. Abstract PP43A-2309.

L.E. Lisiecki, S. Ahn, G. Gebbie, A.M. Jones, **D. Khider**, C. Lawrence. (2016). Incorporating the effects of age uncertainty derived from benthic δ^{18}O alignment into paleoceanographic data compilations. *AGU Fall Meeting*, San Francisco, CA. Abstract PP33D-04.

Khider, D., D. Garijo, J. Emile-Geay, Y. Gil, N. McKay, V. Ratnakar. (2016). The future of past climates: LinkedEarth and 21st century paleoclimatology. *SciDataCon*.

Khider, D., J. Emile-Geay, N. McKay, L. von Gunten, D. Kauffman. (2016). PAGES2k: data crowd-curation for collaborative paleoscience. *SciDataCon*.

Tems, C., W. Berelson, R. Thunell, E. Tappa, X. Xu, **D. Khider**, S. Lund, O. Gonzalez-Yajimovich. (2016). High-frequency fluctuations in the eastern tropical North Pacific oxygen minimum zone during the last 1200 years. *AGU Ocean Sciences meetint*, Abstract PC51A-03.

Khider, D., S. Ahn, L. Lisiecki, C. Lawrence, M . Kienast. (2015). On the timing of glacial terminations in the equatorial Pacific. *AGU Fall Meeting*, San Francisco, CA. Abstract PP53C-2365.

Lisiecki, L., S. Ahn, **D. Khider**, C. Lawrence. (2015). Probabilistic Stack of Plio-Pleistocene benthic δ^{18}O records constructed using profile hidden Markov models. *AGU Fall Meeting*, San Francisco, CA. Abstract PP13D-07.

Khider, D., L. Lisiecki. (2014). Statistical constraints on the relative link between eccentricity forcing and the 100,000-year glacial cycle. *AGU Fall Meeting*, San Francisco, CA. Abstract PP41D-1436.

Stott, L., **D. Khider**, C. Jackson, G. Huerta. (2014). What forced Holocene millennial-scale variability? A tale from the Western Tropical Pacific. *AGU Fall Meeting*, San Francisco, CA. Abstract PP41C-1379 (Presenting Author).

Khider, D., L. Stott, R. Saikku, J. Partin, C. Jackson, D. Hammond, A. Newton, R. Thunell. (2013). How unusual is the 20th century within the Indo-Pacific Warm Pool? *AGU Fall Meeting*, San Francisco, CA. Abstract PP42A-03.

Khider, D., T. Quinn, C. Reynolds. (2012). Assessing the temperature variability from Mg/Ca and δ^{18}O in *Globigerinoides ruber* from the Northern Gulf of Mexico. *AGU Fall Meeting*, San Francisco, CA. Abstract PP43A-2008.

Reuter, J,. L. Stott, **D. Khider**. (2012). Middle East Rainfall Variability during the Common Era. *AGU Fall Meeting*, San Francisco, CA. Abstract PP21B-1992.

Khider, D., L. Stott, R. Saikku, D. Hammond. (2011). Evidence for a Bipolar Seesaw during the Late Holocene. *AGU Fall Meeting*, San Francisco, CA. Abstract PP34A-02.

Khider D, L. Stott, J. Emile-Geay, R. Thunell (2010). Assessing ENSO over the past millennium: a western tropical Pacific perspective. *AGU Fall Meeting*, San Francisco, CA. Abstract PP51B-05.

Khider, D., L. Stott, J. Emile-Geay, R. Thunell (2010). Has El Niño changed over the past millennium? *Graduate Climate Conference*, Seattle, WA.

Khider, D., L. Stott, J. Emile-Geay, R. Thunell (2010). A history of ENSO variability over the past millennium as told by a marine sediment core from the western tropical Pacific. *10th International Conference on Paleoceanography*, La Jolla, CA.

Khider, D., L. Stott, J. Emile-Geay, R. Thunell (2009). Inter- and intrannual variability in the production of planktonic foraminifera: implications for ENSO reconstruction based on the oxygen isotope distribution of individuals. *AGU Fall Meeting*, San Francisco, CA. Abstract PP13D-1434.

INVITED TALKS

2020

AI in the paleogeosciences: Progress, Challenges, and Opportunities
IS-GEO

AI in the paleogeosciences: Progress, Challenges, and Opportunities
Artificial Intelligence Division, Information Sciences Institute, University of Southern California.

2017

Testing the Millennial-Scale Holocene Solar-Climate Connection in the Indo-Pacific Warm Pool.
Department of Earth Sciences, University of Southern California.

The future of past climates: LinkedEarth and 21st century paleoclimatology.
Department of Earth Science Speaker's Club, University of California, Santa Barbara. EarthCube Lecture

The future of past climates: LinkedEarth and 21st century paleoclimatology.
Department of Earth Science, California State University, Bakersfield. EarthCube Lecture

The future of past climates: EarthCube and 21st century paleoclimatology.
Department of Earth, Environmental, and Planetary Sciences, Brown University. EarthCube Lecture

2016 The future of past climates: LinkedEarth and 21st century paleoclimatology.
College of Earth, Ocean, and Atmospheric Sciences, Oregon State University. EarthCube Lecture

The future of past climates: LinkedEarth and 21st century paleoclimatology.
Institute for Geophysics Seminar, The University of Texas at Austin. EarthCube Lecture

The future of past climates: LinkedEarth and 21st century paleoclimatology.
Department of Earth Sciences Paleoenvironmental Seminar, University of Southern California.

2015 Probabilistic timing of glacial terminations in the Tropical Pacific.
Department of Earth Sciences Paleoenvironmental Seminar, University of Southern California

2014 How unusual is the 20th century within the Indo-Pacific Warm Pool?
Department of Earth Science Speaker's Club, University of California, Santa Barbara

Assessing millennial-scale variability during the Holocene: a western tropical Pacific perspective.
Department of Geography Climate Research seminar, University of California, Santa Barbara

Assessing millennial-scale variability during the Holocene: a western tropical Pacific perspective.
Interdepartmental graduate program in Marine Science seminar, University of California, Santa Barbara

2011 Evidence for a Bipolar Seesaw over the Holocene.
Institute for Geophysics Seminar, The University of Texas at Austin

2010 Effect of salinity on foraminiferal Mg/Ca: Paleoceanographic implications.
Department of Earth Sciences Paleoenvironmental Seminar, University of Southern California

Is El Niño changing? A perspective from the Indonesian Seas.
Department of Earth Sciences Paleoenvironmental Seminar, University of Southern California

2008 How unusual is the 20th century?
Department of Earth Sciences Paleoenvironmental Seminar, University of Southern California

SYNERGISTIC ACTIVITIES

Workshops Participation

2017 · GeoChronR.
Northern Arizona University, Flagstaff, AZ.

2017 · PAGES OC3.
Oregon State University, Corvallis, OR.

2016 · GeoChronR.
Northern Arizona University, Flagstaff, AZ.

2016 · Workshop on Paleoclimate Data Standards.
NOAA, Boulder, CO.

2015 · Expert Witness Training Academy: Effectively Communicating Science.
William Mitchell College of Law, St Paul, MN.

2013 · PMIP Ocean Workshop 2013: Understanding changes since the Last Glacial Maximum.
Corvallis, OR.

2013 · PAGES COMPARE Workshop: LGM sea surface temperatures.
Corvallis, OR.

2010 · ENSO variability workshop.
Scripps Institution of Oceanography, University of California San Diego, San Diego, CA.

Reviewer

Science, Nature, Nature Communications, Nature Geoscience, Geology, Geophysical Research Letters, Paleoceanography, Marine Micropaleontology, Palaeogeography Palaeoclimatology Palaeoecology, Journal of Geophysical Research-Oceans, Geochemistry Geophysics Geosystems, Climate of the Past, Quaternary Science Reviews, Journal of Climate.

Community Service

2019-2020 · Organizing Committee, *EarthCube Annual Meeting*

2014 · Session convener and chair, *AGU Fall Meeting*

2012–2013 · Judge, Outstanding Student Paper Awards, *AGU Fall Meeting*

2011 · Organizer, USC Paleoenvironmental Seminar Series

2010 · Wrigley Institute Summer Outreach Program

FUNDING

2020 Collaborative Research: A Big Data Approach to Fundamental Paleoclimate Questions - National Science Foundation, Paleo Perspective on Climate Change

2020 Collaborative Research: PReSto: A Paleoclimate Reconstruction Storehouse to Broaden Access and Accelerate Scientific Inference - National Science Foundation, Geoinformatics

SKILLS

Technical

Dual-inlet mass spectrometry

Inductively coupled plasma atomic emission spectroscopy (ICP-AES)

Familiarity with continuous flow isotope mass spectrometry

Analytical Bayesian Inference, Time series analysis

Computer Python, R, Matlab

Languages French, English (fluent)

AWARDS

2014-2015 Editor's citation for contribution in refereeing for *Nature*

2011-2013 UTIG Postdoctoral Fellowship

2011 USC Final Summer Dissertation Fellowship

2010 USC Earth Science Departmental Teaching Assistant Award (Geochemistry)

USC Wrigley-Sonosky Fellowship

1st Place USC GPSS Poster Symposium

	WISE Award for nomination as Merit PhD candidate
	USC Department of Earth Science Graduate Research Grant
2008	USC Summer Fellowship for Diversity Enhancement
2006	David M. Wilson and Associate Senior Award for Outstanding Scholastic Achievement in Environmental Engineering
2004-2006	University of Southern California Presidential Scholarship
2005-2006	Rose-Hills Foundation Award
	Wilson Endowed Scholarship

PROFESSIONAL AFFILIATIONS

2007-present	Member of the American Geophysical Union
2018-2020	Member of the International Environmental Modelling and Software Society