

TAMARA PICO

CONTACT INFORMATION

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Earth & Planetary Sciences
UC Santa Cruz
1156 High St.
Santa Cruz, CA, 95064 USA

INTERESTS

My research centers on using solid Earth deformation as a lens to understand coupling between ice sheets, sea level, and landscapes in the past. In particular I use glacial isostatic adjustment modeling as a tool to infer variations in past ice sheets, as well as to understand how landscapes record solid Earth deformation over the ice age.

EDUCATION

Harvard University, Cambridge, MA

Ph.D in Earth and Planetary Sciences

May 2019

Secondary field in Studies of Women, Gender, and Sexuality

A.M., Earth and Planetary Sciences

May 2017

“Insights from past sea level and landscapes through the lens of solid Earth ice-sheet interactions”

Advisor: Jerry X. Mitrovica

Princeton University, Princeton, NJ

June 2014

A.B., Chemistry. With certificates in:

Material Science & Engineering, Engineering Biology, French Language & Culture

APPOINTMENTS

Assistant Professor Earth & Planetary Sciences

July 2021-

Affiliate, Science & Justice Research Center

University of California, Santa Cruz

NSF EAR Postdoctoral Fellow Caltech - Geological & Planetary Sciences

2019 -2021

Secondary appointment: Oregon State University

University of California President’s Postdoctoral Fellow

2020-2021

University of California, Santa Cruz

HONORS AND AWARDS

University of California President’s Postdoctoral Fellowship

2020-2021

NSF Earth Sciences Postdoctoral Research Fellowship

2019-2021

Caltech AGEPS Scholar (California Alliance)

2019-2020

Harvard Bok Center Certificate of Distinction in Teaching Award

2019

Harvard Bok Center Certificate of Distinction in Teaching Award

2018

Harvard Graduate Prize Fellowship

2018-2019

AGU Outstanding Student Paper Award

2017

NSF Graduate Research Fellowship

2015-2018

Sigma Xi

2014

PUBLICATIONS & PATENTS

† indicates advisee

Rovere, A.*, **Pico, T.***, Richards, F., O’Leary, M., Mitrovica, J., Goodwin, I., Austermann, J., Latychev, K., The influence of reef isostasy, dynamic topography, and glacial isostatic adjustment

on the Last Interglacial sea-level record of Northeastern Australia, (accepted, *Communications Earth & Environment*)

* authors contributed equally

Morris, F.K[†], **Pico, T.**, Creveling, J., Grotzinger, J., Melting the Marinoan Snowball Earth: The Impact of Deglaciation Duration on the Sea-Level History of Continental Margins, (submitted, *EPSL*)

Sanborn, L.[†], **Pico, T.**, Donnelly, J.P., Perron, J.T, Glacial isostatic adjustment shifted early Holocene river hydrology in Maine, USA , (submitted, *Geology*)

Cleveland Stout, R.[†], **Pico, T.**, Huybers, P., Mitrovica, J.X., Austermann, J., Imprint of relative sea-level histories on Last Interglacial coral preservation, (submitted, *Geophysical Journal International*)

Kodama, S.T.[†], **Pico, T.** Finnegan, N.J., Lapôtre, M.G.A, Willenbring, J.K., Glacial isostatic adjustment modulates lateral migration rate and morphology of the Red River (North Dakota, USA and Manitoba, Canada), *Geophysical Research Letters*, 2023

Patterson, E.W., Johnson, K.R., Griffiths, M.L., Kinsley, C.W., McGee, D., Du, X., **Pico, T.**, Wolf, A, Ersek, V., Mortlock, R.A., Yamoah, K.A., Bui, T., Xuan, M.T., Do-Trong, Q., Vo, T.V., Dinh, T.H., Glacial changes in sea level modulated millennia-scale variability of the Southeast Asian autumn monsoon, *PNAS*, 2023

Farmer, J. *, **Pico, T.** *, Underwood, O.M, Cleveland-Stout, R., Granger, J., Cronin, T.M., Fripiat, F., Martínez-García, A., Haug, G.H., Sigman, D.M., The Bering Strait was flooded 10,000 years before the Last Glacial Maximum, *PNAS*, 2023 (highlighted in *UCSC News*, *Princeton Research News*, *Forbes*, *National Geographic en Español*, *EOS*, and *ARCUS*)

* authors contributed equally

Pico, T., Toward New and Independent Constraints on Global Mean Sea-Level Highstands During the Last Glaciation (Marine Isotope Stage 3, 5a, and 5c), *Paleoceanography and Paleoclimatology*, 2022

Austermann, J., Wickert, A., **Pico, T.**, Kingslake, J., Callaghan, K.L., Creel, R.C., Glacial isostatic adjustment shapes proglacial lakes over glacial cycles, *Geophysical Research Letters*, 2022

Bergmann, K., Wilcots, J., **Pico, T.**, Boekelheide, N., Anderson, N.T., Cantine, M., Goldberg, S.L, Keller, B., Jost, A., Eyster, A. ‘Onset of carbonate biomineralization drove global reorganization of sedimentation and subsidence patterns’ (*submitted*)

Pico. T., Lamb, M.P., David, S.R., Larsen, I.J, Mix, A., Lehnigk, K., Glacial isostatic adjustment directed incision of the Channeled Scabland by ice-age megafloods, *PNAS*, 2022 (highlighted in *UCSC News* and *Courthouse News*).

Dalton, A.S., **Pico, T.**, Gowan, E., Clague, J.J., Forman, S.L., McMartin, I., Sarala, P., Helmens, K.F. ‘The marine 18O record overestimates continental ice volume during Marine Isotope Stage 3’, *Global & Planetary Change*, 2022

de Gelder, G., Husson, L., Pastier, A.-M., Fernández-Blanco, D., **Pico, T.**, Chauveau, D., Authemayou, C., Pedoja, K., High interstadial sea levels over the past 420ka from Huon terraces (Papua New Guinea), *Communications Earth & Environment*, 2022

Borreggine, M., Powell, E., **Pico, T.**, Mitrovica, J.X., Meadow, R., Tryon, C., ‘Not a Bathtub: A Consideration of Sea-Level Physics for Archaeological Models of Human Migration’, *Journal of*

Archaeological Science, 2021.

Pico, T., Willenbring, J., Dalton, A.S., Hemming, S., ‘Was there a glacial outburst flood in the Torngat Mountains during Marine Isotope Stage 3?’, (*Preprint, Climate of the Past*), 2021

Pico, T., McGee, D., Mitrovica, J.X., Russell, J., ‘Recent constraints on MIS 3 sea level support role of shelf exposure as a control on Indo-Pacific hydroclimate’, AGU Paleoclimatology & Paleoclimate, 2020.

Pico, T., Mitrovica, J.X. , Mix, A.C., ‘Sea-level fingerprinting of the Bering Strait flooding history detects the source of the Younger Dryas climate event’, Science Advances, 2020. (highlighted in *Harvard Gazette*)

Pico, T., Robel, A., Powell, E., Mix, A., Mitrovica, J., Leveraging the rapid retreat of Amundsen Ice Stream 13,000 yrs ago to reveal insight into North American deglaciation, Geophysical Research Letters, 2019. doi: 10.1029/2019GL084789

Pico, T., ‘Towards an assessment of the impact of sediment loading on Last Interglacial sea-level markers’, Geophysical Journal International, 2019. doi: 10.1093/gji/ggz447

Pico, T., J.X. Mitrovica, Perron, J.T. , Ferrier, K.L., Braun, J. , ‘Influence of glacial isostatic adjustment on river evolution along the U.S. mid-Atlantic coast’, Earth & Planetary Science Letters, 2019

Coulson, S., **Pico, T.**, Austermann, J., Moucha R., Mitrovica, J.X., ‘The Role of Isostatic Adjustment and Gravitational Effects on the Dynamics of the Messinian Salinity Crisis’, Earth & Planetary Science Letters, 2019

Dalton, A. S., Finkelstein, S. A., Forman, S. L., Barnett, P. J., **Pico, T.** and Mitrovica, J. X. (2019) ‘Was the Laurentide Ice Sheet significantly reduced during Marine Isotope Stage 3 ?’, *Geology*, 47(2), pp. 111–114.

Pico, T., Birch, L., Weisenberg, J. and Mitrovica, J. X. (2018) ‘Refining the Laurentide Ice Sheet at Marine Isotope Stage 3 : A data-based approach combining glacial isostatic simulations with a dynamic ice model’, *Quaternary Science Reviews*. 195, pp. 171–179. doi: 10.1016/j.quascirev.2018.07.023.

Carlson, A. E., Tarasov, L. and **Pico, T.** (2018) ‘Rapid Laurentide ice-sheet advance towards southern last glacial maximum limit during marine isotope stage 3’, *Quaternary Science Reviews*. 196, pp. 118–123. doi: 10.1016/j.quascirev.2018.07.039.

Pico, T., Mitrovica, J. X., Braun, J. and Ferrier, K. L. (2018) ‘Glacial isostatic adjustment deflects the path of the ancestral Hudson River’, *Geology*, (7), pp. 1–4. doi: 10.1130/G40221.1 (highlighted in *Harvard Gazette*)

Ferrier, K. L., Li, Q., **Pico, T.** and Austermann, J. (2018) ‘The Influence of Water Storage in Marine Sediment on Sea-Level Change’, *Geophysical Research Letters*, 45(5). doi: 10.1002/2017GL076592.

Pico, T., Creveling, J. R. and Mitrovica, J. X. (2017) ‘Sea-level records from the U.S. mid-Atlantic constrain Laurentide Ice Sheet extent during Marine Isotope Stage 3’, *Nature Communications*. Nature Publishing Group, 8(May), p. 15612. doi: 10.1038/ncomms15612.

Ferrier, K. L., Austermann, J., Mitrovica, J. X. and **Pico, T.** (2017) ‘Incorporating sediment compaction into a gravitationally self-consistent model for ice age sea-level change’, *Geophysical Journal International*, 2010, pp. 663–672. doi: 10.1093/gji/ggx293.

Creveling, J. R., Mitrovica, J. X., Clark, P. U., Waelbroeck, C. and **Pico, T.** (2017) ‘Predicted bounds on peak global mean sea level during marine isotope stages 5a and 5c’, *Quaternary Science Reviews*. Elsevier Ltd, 163, pp. 193–208. doi: 10.1016/j.quascirev.2017.03.003.

Pico, T., Mitrovica, J. X., Ferrier, K. L. and Braun, J. (2016) ‘Global ice volume during MIS 3 inferred from a sea-level analysis of sedimentary core records in the Yellow River Delta’, *Quaternary Science Reviews*. Elsevier Ltd, 152, pp. 72–79. doi: 10.1016/j.quascirev.2016.09.012.

(Patent) Stone, H.A., Nunes, J., Um, E., **Pico, T.**: “Novel Droplet-Embedded Microfibers, and Methods and Devices for Preparing and Using Same” U.S. Patent Application No. 14/680,710, filed 2015.

Um, E., Nunes, J. K., **Pico, T.** and Stone, H. A. (2014) ‘Multicompartment microfibers: Fabrication and selective dissolution of composite droplet-in-fiber structures’, *Journal of Materials Chemistry B*, 2(45). doi: 10.1039/c4tb01666a.

SOCIAL STUDIES OF GEOSCIENCE

Pico, T. and Lester, G., ‘*The Colonial History of Geology in the United States*’, Insurrect!, 2021

Pico, T., ‘Foundational Stories: Performing the Origins of US Field Geology’, (in review, *Catalyst: feminism, theory, technoscience*)

Pico, T., Bierman, P., Richardson, S., Doyle, K. ‘First Authorship Gender Gap in the Geosciences’, *AGU Earth & Space Science*, 2020.

Pico., T., ‘*The Darker Side of John Wesley Powell*’, *Scientific American*, 2019

GRANTS

NSF: Collaborative Research: ‘Unraveling North American Ice-Sheet Dynamics and Regional Sea-Level Change along the U.S. Mid-Atlantic over the Last Glacial Cycle’. OCE-2244722. Lead PI: C. Hein (VIMS). Co-PI: T. Pico. *2023-2026*

NSF: Collaborative Research: ‘Bounding global ice volumes over the last glacial cycle using reconstructions of Bering Strait flooding’. OCE – 2054757. **Lead PI: T. Pico.** Co-PI: D. Sigman (Princeton University) *2021-2024*

NSF: ‘Tracking Past Ice Sheets with North American River Drainage Basin Captures Induced by Glacial Isostatic Adjustment’. EAR-2120574. **Lead PI: T. Pico.** *2021-2024*

KEYNOTE TALKS

NSF Frontiers in Ocean Sciences Symposium, June 2021

Landscapes Live Series (EGU Geomorphology Section), May 2021

INVITED DEPARTMENTAL SEMINARS

Caltech Seismo Seminar, April 2022

UC Santa Cruz, Ocean Sciences Seminar, April 2022

University of Nebraska, Lincoln, Colloquium, March 2022

Dartmouth, Colloquium, February 2022

MIT, PAOC Colloquium, February 2022

University of Washington, Colloquium, March 2021

West Virginia University, Colloquium, February 2021

UCLA, Colloquium, January 2021

Oregon State University, Quaternary Tea Talk, October 2020

UC Berkeley, Colloquium, October 2020

Lamont-Doherty Columbia University MGG Seminar, September 2020

Caltech, GeoClub Seminar, June 2020

Scripps, Polar Seminar, May 2020

Lehigh University, Departmental Series, April 2020

WHOI, Paleo Seminar, April 2020

UC Santa Cruz, Whole Earth Seminar, February 2020

Northwestern University, February 2020

Cornell University, January 2020

Scripps, IGPP Seminar, January 2020

Jet Propulsion Laboratory, Ice and Ocean Seminar, November 2019

UC Santa Barbara, Earth Science Departmental Seminar, October 2019

Brown University, Lunchtime Seminar, August 2019

Caltech, Special Seminar, April 2019

University of Texas, Austin, DeFord Lecture, March 2019

MIT, COG3 Seminar, February 2019

University of Chicago, Geophysical Sciences Seminar, January 2019

UMass Amherst Quaternary Seminar, November 2018

Lamont-Doherty Columbia University BPE Seminar, October 2018

Princeton University, Brown Bag Solid Earth Seminar, April 2018

University of Vermont, Geology Seminar, April 2018

UC Santa Cruz, Whole Earth Special Seminar, March 2018

GFZ Deutsches GeoForschungZentrum, Earth System Modeling Seminar, May 2017

ETH Zurich, Earth Surface Dynamics Seminar, May 2017

Rutgers University, Special Seminar, March 2017

Oregon State University, Paleoclimate Seminar, September 2016.

CONFERENCE
PRESENTATIONS
AND TALKS

Pico, T., Philosophy of Geoscience Conference, Boston University, May 2023. Talk (**Invited**).

Pico, T., ‘Bering Strait sea level refines the timing and geometry of North American Ice Sheet melt’, GSA Fall Meeting 2021. Talk (**Invited**).

Pico, T., ‘The influence of glacial isostatic adjustment on Channeled Scabland incision’, GSA Fall Meeting 2021. Talk (**Invited**).

Pico, T., ‘Leveraging non-traditional evidence for glacial isostatic adjustment to constrain past ice sheets’, EGU General Assembly 2021. Talk (**Invited**).

Pico, T., Lau, H.P., Chen, C.Y., Austermann, J., Olinger, S., Borregine, M., Wiggins, J.W. ‘Higher education teaching resources on imperialism and scientific racism in the geosciences, from past to present’, AGU Fall Meeting 2020. Poster.

Pico, T., Lamb, M.P, Larsen, I., David, S., and Mix, A.C., ‘Glacial Isostatic Adjustment Directed Incision of the Channeled Scabland by Ice-Age Megafloods’, AGU Fall Meeting 2020. Talk.

Pico, T., Lamb, M.P, Larsen, I., David, S., and Mix, A.C., ‘Glacial Isostatic Adjustment Directed Incision of the Channeled Scabland by Ice-Age Megafloods’, GSA Fall Meeting 2020. Talk.

Pico, T., Robel, A., Powell, E., Mix, A., Mitrovica, J., ‘Leveraging the rapid retreat of the Amundsen Ice Stream 13,000 yrs ago to constrain large-scale North American deglaciation’, AGU Fall Meeting 2019. Talk.

Pico, T., J.X. Mitrovica, D. McGee, J.M., Russell, ‘An ice-age lever for hydroclimate? Recent constraints on MIS 3 sea level support shelf exposure as major control on Indo-Pacific Warm Pool over the last ice age’, AGU Fall Meeting 2019. Talk.

Pico, T., ‘Body metaphors in field geology: implications for gender- or sex- based harassment’, AGU Fall Meeting 2019. Poster. (highlighted in **EOS**)

Pico, T. ‘150 years later: Revisiting the legacy of John Wesley Powell and his expedition to the Grand Canyon’, GSA Fall Meeting 2019. Poster.

T. Pico, L. Birch, J.X. Mitrovica: “A small Laurentide Ice Sheet until mid-MIS 3: Insights from glacial isostatic adjustment modeling, non-glacial deposits, and sea-level histories”, INQUA 2019. Talk.

T. Pico, J.X. Mitrovica, A.C. Mix: “Two-phase flooding of the Bering Strait reflects the sea-level fingerprint of an expanding ice-free corridor”, AGU Fall Meeting 2018, Talk.

T. Pico, J.X. Mitrovica, J.T. Perron, K.L. Ferrier, J. Braun: “Ancient landscapes along the U.S. mid-Atlantic coast record glacial isostatic adjustment ”, AGU Fall Meeting 2017, Talk (Invited).

T. Pico, S. Richardson, P. Bierman, “The first-authorship geoscience gender gap: Underrepresentation of women first authors in leading geoscience journals, 2013-2018”, AGU Fall Meeting 2018, Poster.

T. Pico, P. Bierman, J.X. Mitrovica, J.T. Perron, K.L. Ferrier, J. Braun : “The response of U.S. east coast rivers to glacial isostatic adjustment”, GSA Fall Meeting 2018, Talk.

T. Pico, J.X. Mitrovica, A.C. Mix: “Linking the timing of the Cordilleran-Laurentide ice saddle retreat to the inundation history of the Bering Strait”, Ocean Sciences Meeting 2018, Talk.

T. Pico, J.X. Mitrovica, J.T. Perron, K.L. Ferrier, J. Braun: “Using ancient landscapes along the U.S. mid-Atlantic to assess the influence of glacial isostatic adjustment on river evolution: the case for the Hudson, Delaware, Susquehanna, and Potomac”, AGU Fall Meeting 2017, Talk.

T. Pico, J.X. Mitrovica, A.C. Mix: “Reconciling Observations of the Bering Strait Resubmergence with North American Ice Sheet Melt Histories”, PALSEA2 2017, Talk.

T. Pico, J.X. Mitrovica, J. Braun, K.L. Ferrier: “Coupling landscapes to solid-Earth deformation over the ice-age”, AGU Fall Meeting 2016, Talk.

T. Pico, J. Mitrovica, J. Creveling: “Inferring global ice volumes during Marine Isotope Stage 3”, PALSEA2 2016, Poster presentation.

T. Pico, J. Mitrovica, K. Ferrier, J. Braun: “Using GIA and sediments to reconstruct past sea level and investigate landscape evolution”, CIFAR Meeting 2016, Talk.

T. Pico, J. Mitrovica, K. Ferrier, J. Braun: “Sediments, Sea level, and Global Ice Volumes during Marine Isotope Stage 3 at the Yellow River Delta, China”, PLIOMAX Workshop 2016, Talk.

T. Pico, J. Mitrovica, K. Ferrier, J. Braun: “Exploiting sedimentation datasets to model the impact of sediment loading on sea level at the Yellow River Delta”, AGU Fall Meeting 2015, Poster presentation.

T. Pico, J. Mitrovica, K. Ferrier: “Sediment Loading at the Yellow River Delta: Modeling depositional dynamics and impact on regional sea level”, GSA Fall Meeting 2015, Talk.

E. Um, J. Nunes, **T. Pico**, H.A. Stone: “Droplet necklace: Encapsulation of droplets in a microfiber with microfluidics”, MRS Spring 2014.

TEACHING

Creator, GeoContext *Summer 2020*
Project for supplementary curriculum aimed at providing a social and political context of geoscience, past and present. Series of teaching modules freely available online. Covered in the *Princeton Alumni Weekly*, *EOS*, and *NSF Science Matters*.

Mentor, Princeton Recognizing Inequalities and Standing for Justice Initiative *Summer 2020*
Wesley Wiggins '20: “Race in the geosciences: imperialism, scientific racism, and educational training from past to present in the United States”, part of *GeoContext*

Harvard Teaching Fellow, Earth and Planetary Sciences *Spring 2019*
EPS261: Sea-Level Change. Programming primer, midterm and final project.

Harvard Senior Thesis Adviser, Earth and Planetary Sciences *2018-2019*
Rebecca Cleveland Stout '19: “Leveraging Preservation Bias in Last Interglacial Coral Sea-Level Records to Refine Global Ice Volumes Over the Ice Age” (*Hoopes Prize Winner - top 3% of class*)

Harvard WGS98/Junior Independent Study Adviser, Women, Gender, and Sexuality Studies
Cynthia Chang '20: “The Role of Self-Education in Defining Women’s Bodies” *2018-2019*

Harvard Teaching Fellow, Earth and Planetary Sciences *Fall 2017*
EPS10: A Brief History of the Earth. Bi-weekly labs and one-day field trip.

Harvard Independent Study Adviser, Earth and Planetary Sciences *Fall 2017*
 Sophia Yannis '18: "The influence of the Fennoscandian Ice Sheet on Marine Isotope 6 global ice volume estimates"

Harvard Independent Study Adviser, Earth and Planetary Sciences *Summer 2017*
 Jaime Weisenberg '20: "Testing MIS 3 Laurentide Ice Sheet configurations"

Harvard Teaching Fellow, Earth and Planetary Sciences *Spring 2017*
 EPS10: A Brief History of the Earth. Bi-weekly labs and one-day field trip.

Harvard Teaching Fellow, School of Engineering and Applied Sciences *Fall 2015*
 ES190: Introduction to Material Science. Weekly section.

SCIENTIFIC SERVICE

PROFESSIONAL SERVICE

Journal Reviewer: Nature Geoscience, Science Advances, Geology, Climate of the Past, Quaternary Science Reviews, Earth & Planetary Science Letters, Nature Communications, Geomorphology, AGU Paleoclimatology and Paleoclimatology, Communications Earth & Environment.

Session Organizer and Chair: International Union for Quaternary Science (INQUA) 2019, AGU Fall Meeting 2019, 2020, 2022

Scientific Proposal Panelist & Reviewer: NASA, NSF

CAMPUS ACTIVITIES

Lecture for Seoul National University in the World Program, February 2023
 GEODES Tea Time, April 2022
 WISE Coffee Hour, April 2022
 UCSC Science & Justice Research Center Works-In-Progress (see [summary](#)), February 2021

LEADERSHIP, MENTORING, AND OUTREACH	<i>Invited Speaker</i> , Ice Age Flood Institute <i>Invited Panelist</i> , Unlearning Racism in Geoscience (URGE) Reading Group <i>Speaker</i> , Alaska Native Science & Engineering Program - Middle School (ANSEP) <i>Invited Panelist</i> , Caltech Uncomfortable Things Series <i>Leader</i> , Geodynamics, Landscapes, Climate Reading Seminar <i>Mentor</i> , Caltech FUTURE Ignited (DEI) Program <i>Mentor</i> , Caltech Women Mentoring Women Program <i>Action Strategist</i> , Harvard Graduate Women in Science and Engineering Exec Board <i>Mentor</i> , Harvard WiSTEM Mentoring Program (undergraduate group) <i>Invited Speaker</i> , Harvard Graduate Student Union Time's Up Rally <i>Invited Panelist</i> , W.E.B du Bois Society (underrepresented minority group) <i>Invited Speaker</i> , Harvard Foundation Science Conference. <i>Invited Speaker</i> , Harvard Natural History Museum Middle School Program. <i>Invited Speaker</i> , Harvard Keylatch Summer Program. <i>Invited Panelist</i> , Harvard Office of Career Services. <i>Leader</i> , Graduate Student/Post-doc Seminar. Weekly department series. <i>Non-residential tutor</i> , Leverett (Harvard undergraduate house) <i>Tutor</i> , Massachusetts Correctional Institute at Framingham, New Jersey Correctional Facilities	2022 2021 2020-2021 2020 2020-2021 2019-2021 2019-2021 2015-2019 2014-2019 2019 2017 2017 2017 2016 2015-2016 2014-2017 2011-2015
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LANGUAGES English (native), Spanish (bilingual), French (fluent)