

# Julien Emile-Geay

Associate Professor

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## EDUCATION

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- 2001–2006 **Graduate School of Arts and Sciences, Columbia University, New York**  
2006: Ph.D. in Climate Dynamics.  
Dissertation: ENSO dynamics and the Earth's climate : from decades to Ice Ages.  
advisors: Prof. Mark Cane, Dr. Richard Seager, Prof. Peter DeMenocal.  
2003: M.Phil. in Climate Dynamics.
- 2000–2001 **Université Paris VI, France / Ecole Normale Supérieure**  
M.S. in Ocean and Atmosphere Dynamics, with distinction.
- 1998–2000 **Ecole Normale Supérieure, Paris, France**  
B.S. in Earth Sciences, with honors

## PROFESSIONAL APPOINTMENTS

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- 2016–now **Associate Professor of Earth Sciences**, University of Southern California  
2008–2016 **Assistant Professor of Earth Sciences**, University of Southern California  
2006–2008 **Postdoctoral Fellow**, Georgia Institute of Technology  
2001–2006 **Graduate Research & Teaching assistant**, Columbia University

## RESEARCH INTERESTS

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ocean-atmosphere dynamics; low-frequency climate variability  
forward and inverse modeling of climate proxies  
low order climate models, paleoclimate modeling  
climate informatics, model/data fusion.

## PROFESSIONAL AFFILIATIONS

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American Geophysical Union  
Center for Applied Mathematical Sciences (USC)

## RESEARCH SUPERVISION

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### *Postdoctoral Scholars*

- Deborah Khider** (PhD USC, Earth Sciences), principal supervisor, 2016 – 2018.  
awards: EarthCube Distinguished Lecturer
- Michael Erb** (PhD Rutgers, Climate Dynamics), principal supervisor, 2016 – 2017.
- Jonathan Lawhead** (PhD Columbia, Philosophy),  
joint supervisor with Ralph Wedgwood (USC Philosophy), 2014 – 2016.  
awards: USC Sustainability postdoctoral fellowship.
- Maud Comboul** (PhD USC, Civil Engineering), principal supervisor, 2012 – 2015.  
External awards: Climate Informatics Travel Grant 2013.
- Nasim Mirnateghi** (PhD UCSB, Electrical Engineering), principal supervisor, 2011– 2012
- Dominique Guillot** (PhD U. Laval (Quebec), Pure Mathematics), principal supervisor, 2010– 2012  
now assistant professor at the University of Delaware (Mathematical Sciences)

*Ph. D. students*

**Alexander James**, principal supervisor, 2020 – present.

**Feng Zhu**, principal supervisor, 2016 – 2021.

**Jun Hu**, principal supervisor, 2014 – 2019.

**Sylvia Dee**, principal supervisor, 2010 – 2015.

current position: *Assistant Professor, Rice University*

External travel awards obtained while at USC:

PAGES Workshop: Holocene Climate as Context for Future Climate Change. Oct 2014

ThinkSwiss Fellowship for NCCR Climate Summer School, Grindelwald, Switzerland, Sep 2013

**Jianghao Wang**, principal supervisor, 2010 – 2015.

current position: *Data Scientist at the Mathworks, Inc.*

External travel awards obtained while at USC:

PAGES Travel fellowship for the 4th OSM and 2nd YSM, 2013

NCAR Travel fellowship for the 12th International Meeting of Statistical Climatology, 2013

PAGES Travel fellowship for Advances in Climate Field Reconstruction Workshop, 2014

CAS Travel fellowship for the 3rd Asia 2k Workshop, 2014

NSF Travel fellowship for the 4th International Workshop on Climate Informatics, 2014

*Thesis committees*

Max Berkelhammer (2010), Pat Horan (2009), Deborah Khider (2009-2011),

Mengfang Zhu (2009-2012), Michael Cheetham (2009-2012)

*Undergraduate students*

Senior Theses

**Tiffany Tsai**, 2011 *Development of a tropical coral database for paleoclimate reconstruction*

now a MS student at the Miami University of Ohio (Mathematics)

**Jill Hardy** (Spring 2011 senior thesis), *Beyond the Hockey Stick: new approaches to paleoclimate reconstruction*; now a Research Meteorologist with the National Weather Service

Directed research: **Shengyu Wang**, (2018–2019); **Adam Vaccaro**, (2013–2015); **Yuxin Zhou** (2013–2014);

**Aubree Yeiser** (Fall 2012); **Paige Green** (summer 2009)

REFEREED PUBLICATIONS

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Legend: Undergraduate student<sup>Ⓜ</sup>, Graduate student<sup>Ⓢ</sup>, Postdoc<sup>‡</sup>, Senior colleague, Corresponding Author<sup>□</sup>

In review

- 49 Shrivya Manety, Deborah Khider, Christopher Heiser, Nicholas McKay, **J. Emile-Geay**, Michael Erb and Cody Rouston: PaleoRec: A sequential recommender system for the annotation of paleoclimate datasets, *Environmental Data Science*, submitted.

Revised

- 48 F. Zhu<sup>Ⓢ</sup>, **J. Emile-Geay**, K. J. Anchukaitis, G. J. Hakim, A.T. Wittenberg, M. Morales and J. M. King, Volcanoes and ENSO: a re-appraisal with the Last Millennium Reanalysis, *Nature Comm.*, in review.

Published and in press

- 48 Power, S., M. Lengaigne, A. Capotondi, M. Khodri, J. Vialard, B. Jebri, E. Guilyardi, S. McGregor, J.-S. Kug, M. Newman, M. J. McPhaden, G. Meehl, D. Smith, J. Cole, **J. Emile-Geay**, D. Vimont, A. T. Wittenberg, M. Collins, G.-I. Kim, W. Cai, Y. Okumura, C. Chung, K. M. Cobb, F. Delage, Y. Y. Planton, A. Levine, F. Zhu<sup>Ⓢ</sup>, J. Sprintall, E. D. Lorenzo, X. Zhang, J.-J. Luo, X. Lin, M. Balmaseda, G. Wang, and B. J. Henley (2021), Decadal climate variability in the Tropical Pacific: characteristics, causes, predictability, and prospects, *Science*, 374(6563), eaay9165, doi:10.1126/science.aay9165.

- 47 King, J. M., K. J. Anchukaitis, J. E. Tierney, G. J. Hakim, **J. Emile-Geay**, F. Zhu<sup>Ⓢ</sup>, and R. Wilson (2021):

- A data assimilation approach to last millennium temperature field reconstruction using a limited high-sensitivity proxy network. *J. Climate*, doi:10.1175/JCLI-D-20-0661.1
- 46 McKay, N. P.<sup>□</sup>, **J. Emile-Geay** and D. Khider (2021), GeoChronR – an R package to model, analyze and visualize age-uncertain paleoscientific data, *Geochronology*, doi:10.5194/gchron-2020-25.
- 45 Vaccaro, A.<sup>♣</sup>, **J. Emile-Geay**<sup>□</sup>, D. Guillot, R. Verna<sup>♣</sup>, C. Morice, J. Kennedy, & B. Rajaratnam, Climate field completion via Markov random fields – Application to HadCRUT4.6 (2021), *J. Climate*, doi:10.1175/JCLI-D-19-0814.1
- 44 Dee, S. G., K. M. Cobb, **J. Emile-Geay**, T. R. Ault, R. L. Edwards, H. Cheng, and C. D. Charles (2020) Response to Comment on "No consistent ENSO response to volcanic forcing over the last millennium", *Science*, 369(6509), eabc1733, doi:10.1126/science.abc1733.
- 43 Brierley, C. M., Zhao, A., Harrison, S. P., Braconnot, P., Williams, C. J. R., Thornalley, D. J. R., Shi, X., Peterschmitt, J.-Y., Ohgaito, R., Kaufman, D. S., Kageyama, M., Hargreaves, J. C., Erb, M. P., **J. Emile-Geay**, D'Agostino, R., Chandan, D., Carr'e, M., Bartlein, P. J., Zheng, W., Zhang, Z., Zhang, Q., Yang, H., Volodin, E. M., Tomas, R. A., Routson, C., Peltier, W. R., Otto-Bliesner, B., Morozova, P. A., McKay, N. P., Lohmann, G., Legrande, A. N., Guo, C., Cao, J., Brady, E., Annan, J. D., and Abe-Ouchi, A.: Large-scale features and evaluation of the PMIP4-CMIP6 midHolocene simulations, *Clim. Past*, 16, 1847–1872, doi:10.5194/cp-16-1847-2020, 2020.
- 42 Erb, M. P.<sup>‡□</sup>, **J. Emile-Geay**, G. J. Hakim, N. Steiger, and E. J. Steig, Atmospheric dynamics drive most interannual U.S. droughts over the last millennium, *Science Advances*, 6(32), eaay7268, doi:10.1126/sciadv.aay7268.
- 41 Kaufman, D., N. McKay, C. Routson, M. Erb, B. Davis, O. Heiri, S. Jaccard, J. Tierney, C. Dätwyler, Y. Axford, T. Brussel, O. Cartapanis, B. Chase, A. Dawson, A. de Vernal, S. Engels, L. Jonkers, J. Marsicek, P. Moffa-Sanchez, C. Morrill, A. Orsi, K. Rehfeld, K. Saunders, P. S. Sommer, E. Thomas, M. Tonello, M. Toth, R. Vachula, A. Andreev, S. Bertrand, B. Biskaborn, M. Bringue, S. Brooks, M. Caniupan, M. Chevalier, L. Cwynar, **J. Emile-Geay**, J. Fegyveresi, A. Feurdean, W. Finsinger, M.-C. Fortin, L. Foster, M. Fox, K. Gajewski, M. Grosjean, S. Hausmann, M. Heinrichs, N. Holmes, B. Ilyashuk, E. Ilyashuk, S. Juggins, D. Khider, K. Koinig, P. Langdon, I. Larocque-Tobler, J. Li, A. Lotter, T. Luoto, A. Mackay, E. Magyari, S. Malevich, B. Mark, J. Massaferrero, V. Montade, L. Nazarova, E. Novenko, P. Paril, E. Pearson, M. Peros, R. Pienitz, M. Plociennik, D. Porinchu, A. Potito, A. Rees, S. Reinemann, S. Roberts, N. Rolland, S. Salonen, A. Self, H. Seppä, S. Shala, J.-M. St-Jacques, B. Stenni, L. Syrykh, P. Tarrats, K. Taylor, V. van den Bos, G. Velle, E. Wahl, I. Walker, J. Wilmshurst, E. Zhang, and S. Zhilich (2020), A global database of Holocene paleotemperature records, *Scientific Data*, 7(1), 115, doi:10.1038/s41597-020-0445-3.
- 40 Dee, S. G., K. M. Cobb, **J. Emile-Geay**, T. R. Ault, R. L. Edwards, H. Cheng, and C. D. Charles (2020), No consistent ENSO response to volcanic forcing over the last millennium, *Science*, 367(6485), 1477, doi: 10.1126/science.aax2000.
- 39 Zhu, F.<sup>⊗</sup>, **J. Emile-Geay**<sup>□</sup>, Hakim, G.J., King, J. and Anchukaitis, K. (2020), Resolving the differences in the simulated and reconstructed climate response to volcanism over the last millennium, *Geophys. Res. Lett.*, e2019GL086908, 2020.
- 38 Hu, J.<sup>⊗□</sup>, **J. Emile-Geay**, Tabor, C., Nussbaumer, J. and Partin, J. (2020), Deciphering Chinese speleothem  $\delta^{18}\text{O}$  with an isotope-enabled climate model, *Paleoceanography and Paleoclimatology*, 34(12), 2098–2112, doi: 10.1029/2019PA003741. [press highlight](#)
- 37 **J. Emile-Geay**<sup>□</sup>, Cobb, K. M., Cole, J. E. and Eliot, M. (2020), Past ENSO variability: reconstructions, models, and implications, in *"El Niño Southern Oscillation in a Changing Climate"*, AGU monograph, (eds: M. McPhaden, A. Santoso, and W. Cai), doi: 10.1002/9781119548164.ch5.
- 36 Khider, D.<sup>‡□</sup>, **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. Scroton, E. Sutherland, K. Thirumalai, K. Allen, F. Arnaud, Y. Axford, T. T. Barrows, L. Bazin, S. P. 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, N. Gauthier, S. George, E. Grimm, J. Hertzberg, F. Hibbert, A. Hillman, W. Hobbs, M. Huber, A. Hughes, S. Jaccard, J. Ruan, M. Kienast, B. Konecky, G. L. Roux, V. Lyubchich, V. Novello, L. Olaka, J. Partin, C. Pearce, S. 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. Williams, M. Winstrup, N. Zhao, and Y. Zhou (2019), PaCTS v1.0: A Crowdsourced Reporting Standard for Paleoclimate Data, *Paleoceanography and Paleoclimatology*, doi:10.1029/2019PA003632.
- 35 Neukom, R.<sup>□</sup>, L. A. Barboza, M. P. Erb<sup>†</sup>, F. Shi, **J. Emile-Geay**, M. N. Evans, J. Franke, D. Kaufman, L. Lücke, K. Rehfeld, A. Schurer, V. Valler, F. Zhu<sup>®</sup>, S. Brönnimann, G. J. Hakim, B. J. Henley, F. C. Ljungqvist, N. McKay, L. von Gunten (2019), Consistent multi-decadal variability in global temperature reconstructions and simulations over the Common Era, *Nature Geoscience*, 12(8), 643-649, doi:10.1038/s41561-019-0400-0.
- 34 Barboza, L.<sup>□</sup>, **J. Emile-Geay**, Li, B. and He, W. (2019), Efficient reconstructions of Common Era climate via integrated nested Laplace approximations, *J. Agr. Biol. & Env. Stat.*, doi:10.1007/s13253-019-00372-4
- 33 Tardif, R., G. J. Hakim, W. A. Perkins, K. A. Horlick, M. P. Erb, **J. Emile-Geay**, D. M. Anderson, E. J. Steig, and D. Noone (2019), Last millennium reanalysis with an expanded proxy database and seasonal proxy modeling, *Clim. Past*, 15(4), 1251–1273, doi:10.5194/cp-15-1251-2019.
- 32 Zhu, F.<sup>®</sup>, **J. Emile-Geay**<sup>□</sup>, T. R. Ault, N. P. McKay, G. Hakim, D. Khider, E. J. Steig, S. G. Dee, and J. W. Kirchner (2019), Climate models can correctly simulate the continuum of global-average temperature variability, *Proc. Nat. Acad. Sci.*, 116(18), 8728, doi:10.1073/pnas.1809959116
- 31 Hu, J.<sup>®□</sup>, **J. Emile-Geay**, J. Nussbaumer, and D. Noone (2018), Impact of convective activity on precipitation  $\delta^{18}\text{O}$  in isotope-enabled general circulation models, *J. Geophys. Research (Atmospheres)*, 123, 13,595–13,610. doi: 10.1029/2018JD029187.
- 30 Fischer, H., K. J. Meissner, A. C. Mix, N. J. Abram, J. Auermann, V. Brovkin, E. Capron, D. Colombaroli, A.-L. Daniau, K. A. Dyez, T. Felis, S. A. Finkelstein, S. L. Jaccard, E. L. McClymont, A. Rovere, J. Sutter, E. W. Wolff, S. Affolter, P. Bakker, J. A. Ballesteros-Canovas, C. Barbante, T. Caley, A. E. Carlson, O. Churakova (Sidorova), G. Cortese, B. F. Cumming, B. A. S. Davis, A. de Vernal, **J. Emile-Geay**, S. C. Fritz, P. Gierz, J. Gottschalk, M. D. Holloway, F. Joos, M. Kucera, M.-F. Loutre, D. J. Lunt, K. Marcisz, J. R. Marlon, P. Martinez, V. Masson-Delmotte, C. Nehrbass-Ahles, B. L. Otto-Bliesner, C. C. Raible, B. Risebrobakken, M. F. Sanchez-Goni, J. S. Arrigo, M. Sarnthein, J. Sjolte, T. F. Stocker, P. A. Velasquez Alvarez, W. Tinner, P. J. Valdes, H. Vogel, H. Wanner, Q. Yan, Z. Yu, M. Ziegler, and L. Zhou (2018), Palaeoclimate constraints on the impact of 2°C anthropogenic warming and beyond, *Nature Geoscience*, doi:10.1038/s41561-018-0146-0.
- 29 Singh, H. K. A.<sup>□</sup>, G. J. Hakim, R. Tardif, **J. Emile-Geay**, and D. C. Noone (2018), Atlantic multidecadal variability from the last millennium reanalysis, *Climate of the Past*, 1–25, doi:10.5194/cp-2017-49.
- 28 Dee, S. G.<sup>®</sup>, L. Parsons, G. Loope, T. R. Ault, J. T. Overpeck, and **J. Emile-Geay**, Improved spectral comparisons of paleoclimate models and observations via proxy system modeling: implications for multi-decadal variability, *Earth Planet. Sci. Lett.*, 476 (Supplement C), 34–46, doi:10.1016/j.epsl.2017.07.036
- 27 PAGES 2k Consortium (**Emile-Geay, J.**<sup>□</sup>, McKay, N., Kaufman, D., von Gunten, L., Wang, J.<sup>®</sup>, Anchukaitis, K., Abram, N., Addison, J., Curran, M., Evans, M., Henley, B., Hao, Z., Martrat, B., McGregor, H., Neukom, R., Pederson, G., Stenni, B., Thirumalai, K., Werner, J., Xu, C., Divine, D., Dixon, B., Gergis, J., Mundo, I., Nakatsuka, T., Phipps, S., Routson, C., Steig, E., Tierney, J., Tyler, J., Allen, K., Bertler, N., Björklund, Chase, B., Chen, M., Cook, E., de Jong, R., DeLong, K., Dixon, D., Ekaykin, A., Ersek, V., Filipsson, H., Francus, P., Freund, M., Frezzotti, M., Gaire, N., Gajewski, K., Ge, Q., Goosse, H., Gornostaeva, A., Grosjean, M., Horiuchi, K., Hormes, A., Husum, K., Isaksson, E., Kandasamy, S., Kawamura, K., Kilbourne, K., Koc, N., Leduc, G., Linderholm, H., Lorrey, A., Mikhalenko, V., Mortyn, G., Motoyama, H., Moy, A., Mulvaney, R., Munz, P., Nash, D., Oerter, H., Opel, T., Orsi, A., Ovchinnikov, D., Porter, T., Roop, H., Saenger, C., Sano, M., Sauchyn, D., Saunders, K., Seidenkrantz, M., Severi, M., Shao, X., Sicre, M., Sigl, M., Sinclair, K., St. George, S., St. Jacques, J., Thamban, M., Thapa, U., Thomas, E., Turney, C., Uemura, R., Viau, A., Vladimirova, D., Wahl, E., White, J., Yu, Z., Zinke, J.), 2017: A global multiproxy database for temperature reconstructions of the Common Era, *Scientific Data*, 4, 170,088 EP, doi:10.1038/sdata.2017.88.
- 26 Gil, Y., D. Garijo, V. Ratnakar, D. Khider, **J. Emile-Geay**, and N. McKay (2017), A controlled crowdsourcing approach for practical ontology extensions and metadata annotations, in *The Semantic Web – ISWC 2017*, edited by C. d’Amato,

- M. Fernandez, V. Tamma, F. Lecue, P. Cudre-Mauroux, J. Sequeda, C. Lange, and J. Heflin, pp. 231–246, Springer International Publishing, Cham, doi:10.1007/978-3-319-68204-4 24.
- 25 Hu, J.<sup>⊗</sup>, **J. Emile-Geay**<sup>□</sup> and Partin, J. (2017): Correlation-based interpretations of paleoclimate data – where statistics meet past climates, *Earth Planet. Sci. Lett.*, 459, 362–371, doi:10.1016/j.epsl.2016.11.048
- 24 Dee, S.G.<sup>⊗□</sup>, Steiger, N.J., **J. Emile-Geay**, and Hakim, G.J. (2016): On the utility of proxy system modeling in estimating climate states over the Common Era, *Journal of Advances in Modeling Earth Systems*, 8, doi:10.1002/2016MS000677.
- 23 Hakim, G.J.<sup>□</sup>, **J. Emile-Geay**, Steig, E.J., Noone, D.C., Anderson, D.M., Tardif, R., Steiger, N.J. and Perkins, W.A. (2016): The Last Millennium Climate Reanalysis Project: Framework and First Results, *J. Geophys. Res. (Atmos.)*, 121, 6745–6764, doi:10.1002/2016JD024751.
- 22 Chen, S., Hoffmann, S., Lund, D.C., Cobb, K.M., **J. Emile-Geay**, and Adkins, J.F. (2016): A High-resolution Speleothem Record of Western Equatorial Pacific Rainfall: Implications for Holocene ENSO Evolution *Earth Planet. Sci. Lett.*, 442, 61–71, doi:10.1016/j.epsl.2016.02.050.
- 21 McKay, N.P.<sup>□</sup> and **J. Emile-Geay**, (2016): Technical Note: The Linked Paleo Data framework a common tongue for paleoclimatology, *Clim. Past*, 12, 1093–1100, 10.5194/cp-12-1093-2016
- 20 **Emile-Geay, J.**<sup>□</sup>, Tingley, M.P. (2016): Inferring climate variability from nonlinear proxies. Application to paleo-ENSO studies, *Clim. Past*, 12, 31-50, doi:10.5194/cp-12-31-2016.
- 19 **Emile-Geay, J.**<sup>□</sup>, K.M. Cobb, M. Carré, P. Braconnot, J. Leloup, Y. Zhou<sup>⊙</sup>, S. P. Harrison, T. Corrège, M. Collins, R. Driscoll<sup>⊗</sup>, M. Elliot, H. McGregor, B. Schneider, A. Tudhope, (2016) Links between tropical Pacific seasonal, interannual, and orbital variability during the Holocene, *Nature Geoscience*, doi:10.1038/ngeo2608.
- 18 Wang, J.<sup>⊗</sup>, **J. Emile-Geay**<sup>□</sup>, Guillot, D.<sup>‡</sup>, McKay, N.P., Rajaratnam, B. (2015), Fragility of reconstructed temperature patterns over the Common Era: Implications for model evaluation, *Geophys. Res. Lett.*, 42, doi:10.1002/2015GL065265
- 17 Khider, D.<sup>‡□</sup>, Huerta, G., Jackson, C., Stott, L.D., **J. Emile-Geay**, (2015) A Bayesian, multivariate calibration for *Globigerinoides ruber* Mg/Ca, *Geophys. Geochem. Geosys.*, doi:10.1002/2015GC005844
- 16 Comboul, M.<sup>‡□</sup>, **J. Emile-Geay**, Hakim, G.J., Evans, M. N. (2015) Paleoclimate Sampling as a Sensor Placement Problem, *J. Climate*, 28, 7717–7740, doi:10.1175/JCLI-D-14-00802.1
- 15 Dee, S.G.<sup>⊗□</sup>, **J. Emile-Geay**, Evans, M.N., Allam, A.<sup>‡</sup>, Steig, E., and Thompson, D.M.<sup>‡</sup> (2015), PRYSM: an open-source framework for proxy system modeling, with applications to oxygen-isotope systems, *J. Adv. Mod. Earth Sys.*, 07, doi:10.1002/2015MS000447
- 14 Guillot, D.<sup>‡□</sup>, Rajaratnam, B., J. Emile-Geay, (2015) Statistical paleoclimate reconstructions using Markov random fields, *Ann. Applied. Statist.*, 9 (1), 324–352. doi:10.1214/14-AOAS794
- 13 Dee, S.G.<sup>⊗□</sup>, Noone, D., Buening, N.‡, J. Emile-Geay, and Zhou, Y.<sup>⊙</sup> (2015): SPEEDY-IER: A Fast Atmospheric GCM with Water Isotope Physics, *J. Geophys. Res. Atmos.*, 120, 73–91, doi:10.1002/2014JD022194
- 12 Comboul, M.<sup>‡□</sup>, **J. Emile-Geay**, Evans, M. N., Mirnateghi, N.‡, Cobb, K. M., and Thompson, D. M.<sup>⊗</sup> (2014): A probabilistic model of chronological errors in layer-counted climate proxies: applications to annually-banded coral archives, *Clim. Past*, 10:2, 825–841, doi:10.5194/cp-10-825-2014
- 11 Wang, J.<sup>⊗□</sup>, **J. Emile-Geay**, Guillot, D.<sup>‡</sup>, Smerdon, J., Rajaratnam, B. (2014): Evaluating climate field reconstruction techniques using improved emulations of real-world conditions, *Clim. Past.*, 10, 1–19, doi:10.5194/cp-10-1-2014
- 10 J.W. Partin<sup>‡□</sup>, T.M. Quinn, C-C Shen, J. Emile-Geay, F.W. Taylor, C.R. Maupin<sup>⊗</sup>, K. Lin, C.S. Jackson, J.L. Banner,

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- 9 Ault, T.<sup>‡□</sup>, Deser, C., Newman, M. and **J. Emile-Geay**(2013): Characterizing decadal to centennial variability in the equatorial Pacific during the last millennium, *Geophys. Res. Lett.* , doi:10.1002/grl.50647
- 8 **J. Emile-Geay**<sup>□</sup>, Eshleman, J. (2013): Towards a Semantic Web for Paleoclimatology *Geophys. Geochem. Geosys.*, 14(2):457–469, doi:10.1002/ggge.20067.
- 7 **Emile-Geay, J.**<sup>□</sup>, Cobb, K.M., Mann, M.E., and Wittenberg, A. T. (2013): Estimating Tropical Pacific SST variability over the Past Millennium. Part 1: Methodology and Validation. *J. Clim.*, 26, 2302–2328, doi:10.1175/JCLI-D-11-00510.1
- 6 **Emile-Geay, J.**<sup>□</sup>, Cobb, K.M., Mann, M.E., and Wittenberg, A. T. (2013): Estimating Tropical Pacific SST variability over the Past Millennium. Part 2: Reconstruction and Uncertainties. *J. Clim.*, 26, 2329–2352, doi:10.1175/JCLI-D-11-00511.1 (ISI Highly Cited paper)
- 5 Khider<sup>®□</sup>, D., L. D. Stott, **J. Emile-Geay**, R. Thunell and D. Hammond (2011): Assessing El Niño Southern Oscillation Variability During the Past Millennium, *Paleoceanography*, doi:10.1029/2011PA002139
- 4 Thompson ,D. M.<sup>®□</sup>, Ault, T. R., Evans, M. N., Cole, J. E., and **J. Emile-Geay** (2011): Comparison of observed and simulated tropical climate trends using a forward model of coral  $\delta^{18}\text{O}$  , *Geophys. Res. Lett.*, 38, L14706, doi:10.1029/2011GL048224
- 3 Dutay, J.C.<sup>□</sup>, **J. Emile-Geay**, D. Iudicone, P. Jean-Baptiste, G. Madec and C. Carouge (2010): Helium Isotopic Constraints on simulated ocean circulations. Implications for Abyssal Theories, *Environmental Fluid Mechanics*,10(1), 257–273, 10.1007/s10652-009-9159-y
- 2 **Emile-Geay, J.**<sup>□</sup> and G. Madec (2009): Geothermal Heating, Diapycnal Mixing and the Abyssal Circulation *Ocean Science*, 5, 203–217, doi:10.5194/os-5-203-2009
- 1 **Emile-Geay, J.**<sup>□</sup> and M. A. Cane (2009): Pacific Decadal Variability in the view of linear equatorial wave theory *Journal of Physical Oceanography*, 39:203–218, doi: 10.1175/2008JPO3794.1
- ..... Publications prior to USC start date .....
- 0 **Emile-Geay, J.**<sup>□</sup>, R. Seager, M. A. Cane, E.C. Cook, G.H. Haug (2008): Volcanoes and ENSO over the past millennium, *Journal of Climate*. 21(13), 3134–3148, doi:10.1175/2007JCLI1884.1
- 1 **Emile-Geay, J.**<sup>□</sup>, Cane, M. A., Seager, R. S., Kaplan, A. and P. Almasi (2007): El Niño as a mediator of the solar influence on climate, *Paleoceanography*, 22, 3, doi:10.1029/2006PA001304
- 2 Herweijer, C.<sup>□</sup>, R. Seager, E.R. Cook and **J. Emile-Geay** (2007): North American droughts of the last Millennium from a gridded network of tree-ring data , *Journal of Climate*, 20, 1353-1376
- 3 **Emile-Geay, J.**<sup>□</sup>, M. A. Cane, N. Naik, R. Seager, A. C. Clement and A. van Geen (2003): Warren revisited: Atmospheric freshwater fluxes and "Why is no deep water formed in the North Pacific ?", *Journal of Geophysical Research-Oceans*, 108(C6):3178. doi:10.1029/2001JC001058

## OTHER PUBLICATIONS

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### Articles

- O8 McKay, N. P., and **Emile-Geay, J.**(2018), Linked paleo data: A resource for open, reproducible, and efficient paleoclimatology, *Past Global Change Magazine*, 26(2), 71–71, doi:10.22498/pages.26.2.71.

- O7 **Emile-Geay, J.**, D. Khider<sup>‡</sup>, N. McKay, Y. Gil, D. Garijo, and V. Ratnakar (2018), LinkedEarth: supporting paleoclimate data standards and crowd curation, *Past Global Change Magazine*, 26(2), 62–63, doi:10.22498/pages.26.2.62.
- O6 **Emile-Geay, J.**, Erb, M. P.<sup>‡</sup>, Hakim, G., Steig, E. J. and Noone, D.C. (2017): Climate dynamics with the Last Millennium Reanalysis, *Past Global Changes Magazine*, vol. 25(3), 162, doi:10.22498/pages.25.3.162.
- O5 **Emile-Geay, J.**, and McKay, Nicholas P. (2016): Paleoclimate data standards, *Past Global Changes Magazine*, vol. 24(1), 47 doi:10.22498/pages.24.1.47.
- O4 Kaufman, D.S. & PAGES 2K Consortium (2014): A Community-Driven Framework for Climate Reconstructions, *Eos, Transactions, American Geophysical Union*, Volume 95, Number 40, 7 October 2014. 361–368, doi: 10.1002/2014EO40
- O3 Thompson, D.M.<sup>®</sup>. T.R.Ault<sup>‡</sup>, M.N. Evans, J.E.Cole, **J. Emile-Geay** and A. LeGrande (2013): Coral-CGCM comparison highlights role of salinity in long-term trends. P. Braconnot, C. Brierley, S.P. Harrison, L. von Gunten (eds). El Niño-Southern Oscillation: observations and modeling, *PAGES news* 21(2)
- O2 **J. Emile-Geay**<sup>□</sup> (2012): , What is the outlook for ENSO? *PAGES news*, 20(1)
- O1 Clement, A.C., J. Emile-Geay, R. Seager, M. A. Cane and M.N. Evans (2006): America for the last millennium, *PAGES Newsletter*

## Monographs

- 2014 **Emile-Geay, J.**, Data Analysis in the Earth & Environmental Sciences, 247pp, Second edition, <http://dx.doi.org/10.6084/m9.figshare.1014336>.
- 2008 **Emile-Geay, J.**, El Niño and the Earth's climate: from decades to ice ages, Verlag Dr Müller, 163pp.

## Edited volumes

- 2015 Proceedings of the Fifth International Workshop on Climate Informatics: CI 2015. J. G. Dy, **J. Emile-Geay**, V. Lakshmanan, Y. Liu (Eds.). September 2015. ISBN: 978-0-9973548-0-5

## CITATION STATISTICS (AS OF FEB 2021)

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51 citations per article (2727 total), based on 53 indexed papers. *h*-index: 28

## INVITED LECTURES AND CONFERENCE PRESENTATIONS OF THE PAST 5 YEARS

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**Woods Hole Oceanographic Institution**, Climate Seminar – September 2020

The Case Against the Meghalayan.

**International conference on the Impacts of large volcanic eruptions on climate and societies**

University of Geneva, Switzerland – August 2020

Resolving the differences in the simulated and reconstructed temperature response to volcanism over the Last Millennium

**Scripps Institution of Oceanography**, CASPO Seminar – May 2020

Climate scaling: what it tells us about the climate system, and its models.

**Princeton University**, Climate Seminar – May 2019

Climate scaling: what it tells us about the climate system, and its models.

**California Institute of Technology**, ESE Seminar – Feb 2019

Climate scaling: what it tells us about the climate system, and its models.

**International Workshop on Climate Informatics**, Boulder, CO – Sep 2018

Paleoclimate informatics: enabling knowledge discovery about past climates

**AGU Fall meeting**, New Orleans, LA – Dec 2017

Geothermal influences on the abyssal ocean

**Past2Future Workshop**, Reading, UK – July 2017

Paleoclimate uncertainty: representing the known unknowns

**PAGES Open Science Meeting**, Zaragoza, Spain – May 2017

The future of old things: geoinformatics for better paleoscience

**Earth Science colloquium**, Dartmouth College, NH – Nov 2016

The future of past climates – geoinformatics for better climate science

**ESS colloquium**, University of California at Irvine – Oct 2016

Links between tropical Pacific seasonal, interannual, and orbital variability during the Holocene

**AOS seminar**, University of California in Los Angeles – March 2016

Links between tropical Pacific seasonal, interannual, and orbital variability during the Holocene

**AGU Fall meeting**, San Francisco, CA – Dec 2015

The climate continuum revisited.

**AGU Fall meeting**, San Francisco, CA – Dec 2015

Holocene constraints on tropical Pacific dynamics.



## OTHER CONFERENCE PRESENTATIONS

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as first or co-author.

2017 7 presentations (5 oral, 2 poster)  
2016 8 presentations (5 oral, 3 poster)  
2015 11 presentations (8 oral, 3 poster)  
2014 8 presentations (7 oral, 1 poster)  
2013 7 presentations (4 oral, 3 poster)

## HONORS AND AWARDS

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2012 Editors' Citation for Excellence in Refereeing for Journal of Geophysical Research-Atmospheres  
2008 Leverhulme Trust postdoctoral travel award for the Leverhulme Climate Symposium (Cambridge, UK)  
2004–2005 Boris Bakhmeteff Fellowship in Fluid Mechanics  
2001–2006 Faculty Fellow as a Columbia GSAS student

## FUNDING HISTORY

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### Active Grants

*EarthCube Capabilities: PaleoCube: Enabling Cloud-Based Paleoclimatology*  
NSF, EarthCube program (co-PI)  
USC Amount: \$290,283, 09/01/2021 – 08/31/2024.

*Collaborative Research: A Big Data Approach to Fundamental Paleoclimate Questions*  
NSF, Paleo Perspectives on Climate Change (lead PI)  
USC Amount: \$398,099, 09/01/2020 – 08/31/2023.

*Collaborative Research: PReSto: A Paleoclimate Reconstruction Storehouse to Broaden Access and Accelerate Scientific Inference*  
NSF, Geoinformatics (co PI)  
USC Amount: \$347,629, 07/01/2020 – 06/30/2023.

*Belmont Forum Collaborative Research: Abrupt Change in Climate and Ecosystems: Where are the Tipping Points?*  
Belmont Forum via NSF, ICER-1929554 (co PI)  
Amount: USC portion = \$99,982, 07/1/2019 – 06/30/2022.

### Completed Grants

*Collaborative Research: The global climate response to volcanic eruptions in the Last Millennium Reanalysis*  
NOAA Climate Program Office, NA18OAR4310426 (lead PI)  
Amount: \$299,973 (USC portion = \$194,489), 09/1/2018 – 08/30/2020.

*Collaborative Research: LinkedEarth: Crowdsourcing Data Curation & Standards Development in Paleoclimatology*  
NSF EarthCube program, GEO/OCI Directorates (lead PI)  
Amount: \$797,793 (USC portion = \$684,978), 09/01/2015 – 08/31/2017.

*Collaborative Research: Last Millennium Climate Reanalysis Project*  
NOAA Climate Program Office, solicitation NOAA-OAR-CPO-2014-2003692 (co-PI)  
Amount: \$1,488,473 (USC portion = \$254,255), 08/1/2014 – 07/31/2017.

*Collaborative Research: GeoChronR - open-source tools for the analysis, visualization and integration of time-uncertain geoscientific data*, NSF, Geoinformatics (co-PI)  
Amount: \$566K (USC portion = \$196,655), 07/1/2014 – 06/30/2017.

*Collaborative Research: Efficient high dimensional Bayesian methods for climate field reconstruction*  
NSF, Collaborations in Mathematical Geophysics (co-PI, PI B.Rajaratnam, Stanford)  
Amount: \$419,188 (USC portion = \$214,002), 08/01/2010 – 07/31/2015.

*Collaborative Research: Maximizing the potential of tropical climate proxies through integrated*

*climate-proxy forward modeling.*

NOAA, Climate Change Data and Detection program (Lead PI)

Amount: \$410,791 (USC portion = \$278,858), 08/31/2010 – 08/30/2014.

*Collaborative Research: Multiproxy Reconstructions as a Missing-Data Problem: New Techniques and Their Application to Regional Climates of the Past Millennium*

NSF, Paleo Perspectives on Climate Change (Lead PI)

Amount: \$579,000 (USC portion = \$291,582), 05/06/2010 – 05/05/2014.

## SERVICE AS MEETING COORDINATOR

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- 2017 **Convener** of the international workshop: *Climate Dynamics with the Last Millennium Reanalysis*  
Boulder, CO, Oct 2–4.
- 2016 **Convener** of the international workshop on *Paleoclimate Data Standards*  
Boulder, CO, June 22–23.
- 2015 **Program Committee co-chair** Climate Informatics workshop  
Boulder, CO, Sept 24–25.
- 2015 **Organizer** of an international workshop on Proxy System Modeling  
Catalina Island, CA, May 4–6. 30 participants.
- 2010–2014 **Co-convener** of the yearly Fall AGU sessions “Climate of the Common Era”,  
(with J. Smerdon, K. Anchukaitis, E. Cook)
- 2007 **Co-convener** of the Fall AGU session PP07 (with Yemane Asmerom)

## SERVICE AS ACADEMIC REVIEWER

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- 2020 Editor for *Climate of the Past* special issue on PMIP4-CMIP6.
- 2018 - now Associate Editor for the Nature Publishing Group’s *Scientific Data*
- 2002 - now **Article Reviews** for *Geophysical Research Letters*, *Climate Dynamics*, *Journal of Climate*,  
*Journal of Geophysical Research-Oceans*, *Climate of the Past*, *Environmental Research Letters*,  
*Journal of Geophysical Research-Atmospheres*, *Earth System Dynamics*, *PNAS*,  
*Nature Geoscience*, *Nature Education*, *Nature Communications*, *Nature Scientific Reports*, *Nature*,  
*Journal of Physical Oceanography*, *Journal of Marine Research*, *Paleo*<sup>3</sup>, *Scientific Reports*  
*Geochimica and Cosmochimica Acta*, *Global & Planetary Change*,  
*Environmental Research Letters*, *Dendrochronologia*, *Quaternary Science Reviews*,  
*International Journal on Geomathematics*, *Earth & Planetary Science Letters*, *Geology*, *EOS*
- 2006 - now **Proposal Reviews** for the *National Science Foundation* (3-4 per year), the  
*National Oceanographic and Atmospheric Administration* (1) & the *European Research Council* (1) .

## ACADEMIC SERVICE TO THE USC COMMUNITY

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- 2020-2021 Search Committee for a Faculty position in Global Change (Chair).
- 2018 Member of the academic Senate Sustainability Committee.
- 2018 Reviewer for the Graduate School fellowship grant program.
- 2017 Reviewer for USC research grant program. Member, Earth Science faculty review committee.
- 2016 panelist for the **Electoral Commons on Climate Change**
- 2015 Panel moderator at the USC **Know Tomorrow event** (10/02).
- 2015 USC Dornsife Lunch & Lecture: **Pope Francis - Environmental Activist?**, also recounted [here](#)
- 2015 Guest lectures for **Problem without Passports : Ecological Security and Global Politics**
- 2014 Member, Earth Science faculty review committee
- 2011 Lead Organizer of Dornsife Commons Event (11/08/2011)  
Screening of the film “Carbon Nation” with director Q&A session
- 2011 Wrote the learning objectives of the Earth Science department’s undergraduate programs
- 2009 – 2011 Member, Climate Dynamics Search Committee
- 2010– Member, Earth Science Curriculum Committee
- 2009 – Member, Computing Committee

## CLASSES TAUGHT

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- USC GEOL145L** "Lies, Damn lies, and Statistics", Spring 2019  
Undergraduate General Education class (enrollment: 22).
- USC CORE103** "The process of change in Science", Fall 2018  
Undergraduate Thematic Option. Enrollment: 37.
- USC GEOL 157L** "Climate Change", Spring 2018  
Undergraduate General Education class (enrollment:15).
- USC GEOL 150L** "Climate Change", Spring 2010 – 2017, 2021  
Undergraduate General Education class (enrollment:106, 110, 64, 174, 179, 180).  
Course grade: 4.36, 4.26, 4.09, 4.13, 3.59, 4.00, 4.05, 4.09; Instructor grade: 4.60, 4.35, 4.27, 4.37, 3.75, 4.00, 4.34, 4.20
- USC GEOL 599** "The Climate of the Common Era", Spring 2012.  
graduate seminar (enrollment:4)
- USC GEOL 425L** "Data Analysis in the Earth and Environmental Sciences", Fall 2011, Spring 2014, Fall 2015, Fall 2017  
Undergraduate class (enrollment:9,21,6,17). Course grade: 4.00, 4.00, 4.75, 4.67; Instructor grade: 4.13, 4.08, 4.50, 4.67
- USC GEOL 515** "Introduction to Atmospheric Science", Fall 2010, Fall 2014  
Graduate class (enrollment:7,6). Course grade: 4.50, 4.67; Instructor grade: 4.33, 4.67
- USC GEOL 425L** "Data Analysis in the Earth and Environmental Sciences", Fall 2009  
Co-taught with prof. Thorsten Becker. (enrollment:8). Course grade: 4.00; Instructor grade: 4.29
- USC GEOL 351** "Climate Systems", Fall 2015, 25%; Fall 2017, 33%  
Undergraduate class (enrollment:10). Course grade: 4.50; Instructor grade: 4.50

## OUTREACH

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- Featured expert in this USC-produced [video](#).
- Panelist for the USC [Climate Forward](#) event, April 2019
- Featured in [ATTN video](#) on Extreme Heat Events (>340,000 views), July 2018
- Motivational speech at the [Beyond Meat](#) headquarters, El Segundo, CA. (Feb 2018).
- Panelist for [STEAM Sound Bytes](#) (Jan 2018).
- Public lecture on "Climate, Collapse & Capitalism" at the Lightning in a Bottle festival (May 2017).
- Panelist on "Scientifically Speaking" event sponsored by [Sense About Science](#) (March 2017).
- Guest speaker at [BIL conference](#), [Byte of Science](#), (Apr 2016)
- Radio interviews for BBC Radio 5, TalkRadio 630 KHOW, [Annenberg Media](#).
- TV interviews for the BBC, Associated Press, ABC 7, Al Jazeera English, ScienceNow, History Channel, Sky News, [SpectrumNews1](#).
- Quoted in [The Guardian](#), the [New York Times](#), the [Financial Times](#), and local press.