

Cynthia Gerlein-Safdi

Curriculum vitae

Lawrence Berkeley National Laboratory
Earth & Environmental Sciences Area
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EDUCATION

- 2019 | **Certificate in Science, Technology, and Environmental Policy**, Princeton School of Public and International Affairs, Princeton University, USA
- 2017 | **Ph.D.**, Dept. of Civil and Environmental Engineering, program in Environmental Engineering and Water Resources, Princeton University, USA. *Thesis*: Investigating dew deposition on leaves: effects on leaf water content, CO₂, and remote sensing characterization. *Advisor*: Kelly K. Caylor
- 2012 | **M.Eng. in Geophysics**, Geophysics applied to Civil Engineering and Environmental Studies, Engineering School of Geophysics of Strasbourg (EOST), France
- 2011 | **M.Sc. in Environmental Engineering**, University of Strasbourg, France
- 2009 | **B.Sc. in Earth and Planetary Sciences**, University of Strasbourg, France

RESEARCH AND PROFESSIONAL EXPERIENCE

- Oct. 2020 – present | **Lawrence Berkeley National Laboratory** (CA, USA), Climate and Ecosystems Sciences Division. Project scientist.
- 2017 – 2020 | **University of Michigan** (MI, USA), Dept. of Climate and Space Sciences and Engineering. Junior fellow, Michigan Society of Fellows.
- 2015 – 2017 | **Harvard University** (MA, USA), Dept. of Organismic and Evolutionary Biology. Exchange scholar. *Host advisor*: Prof. N. Michele Holbrook.
- 2012 – 2017 | **Princeton University** (NJ, USA), Dept. of Civil and Environmental Engineering. Graduate Research Assistant. *Advisor*: Prof. Kelly K. Caylor.
- 2011 | **Schlumberger Water Services**, Water Resources Group (Santiago, Chile). Geophysical engineer.
- 2010 | **Deutsches GeoForschungsZentrum** (GFZ, German Research Center for Geosciences, Potsdam, Germany), Dept. of Hydrology. Visiting student. *Advisor*: Dr. Heiko Apel.
- 2009 | **UC Berkeley** (CA, USA), Dept. of Earth and Planetary Science. Visiting scholar. *Advisor*: Prof. Michael Manga.

PUBLICATIONS

C. Gerlein-Safdi, A.A. Bloom, E. Kort, G. Plant, and C.S. Ruf. Improving representation of tropical wetland methane emissions with CYGNSS inundation maps. *In review at Global Biogeochemical Cycles*.

M.M. Al-Khaldi, J.T. Johnson, S. Gleason, C.C. Chew, **C. Gerlein-Safdi**, R. Shah and C. Zuffada. Inland water body mapping using CYGNSS coherence detection. *In review at IEEE Transactions on Geoscience and Remote Sensing*.

C. Gerlein-Safdi, G. Keppel-Aleks, F. Wang, S.E. Frohling, and D.L. Mauzerall, 2020. Satellite monitoring of natural reforestation efforts in China's drylands, *One Earth*, 2(1), 98–108, doi: 10.1016/j.oneear.2019.12.015

C.L. Tague, S.A. Papuga, **C. Gerlein-Safdi**, S. Dymond, R.R. Morrison, E.W. Boyer, D. Riveros-Iregui, B. Arora, Y.G. Dialynas, A. Hansen, S. Krause, S. Kuppel, S.P. Loheide, and S.J. Schymanski, 2020. Adding our leaves: a community-wide perspective on research directions in ecohydrology, *Hydrological Processes*, *34*(7), 1665–1673, doi: 10.1002/hyp.13693

C. Gerlein-Safdi and C.S. Ruf, 2019. A CYGNSS-based algorithm for the detection of inland waterbodies, *Geophysical Research Letters*, *46*, 12065–12072, doi: 10.1029/2019GL085134

F. Wang, X. Pan, **C. Gerlein-Safdi**, X. Cao, S. Wang, L. Gu, and Q. Lu, 2019. Vegetation restoration in Northern China: a contrasted picture, *Land Degradation & Development*, *35*(1), 120–8, doi: 10.1002/ldr.3314

C. Gerlein-Safdi, M.C. Koochafkan, M. Chung, F.E. Rockwell, S. Thompson, and K.K. Caylor, 2018. Dew deposition suppresses transpiration and carbon uptake in leaves, *Agricultural and Forest Meteorology*, *259*, 305–316, doi: 10.1016/j.agrformet.2018.05.015

C. Gerlein-Safdi, P.P.G. Gauthier, and K.K. Caylor, 2018. Dew-induced transpiration suppression impacts the water and isotope balances of *Colocasia* leaves, *Oecologia*, *187*:4, 1041–1051, doi: 10.1007/s00442-018-4199-y

C. Wright, A. Kagawa-Viviani, **C. Gerlein-Safdi**, G. Mosquera, M. Poca, H. Tseng, and K.P. Chun, 2017. Advancing ecohydrology in the changing tropics: Perspectives from early career scientists, *Ecohydrology*, *106*:17, e1918, doi: 10.1002/eco.1918

C. Gerlein-Safdi, P.P.G. Gauthier, C.J. Sinkler, and K.K. Caylor, 2017. Leaf water ^{18}O and ^2H maps show directional enrichment discrepancy in *Colocasia esculenta*, *Plant, Cell and Environment*, *40*, 2095–2108, doi: 10.1111/pce.13002

J. Cui, L. Tian, **C. Gerlein-Safdi**, and D. Qu, 2017. The influence of memory, sample size effects, and filter paper material on online laser-based plant and soil water isotope measurements, *Rapid Communications in Mass Spectrometry*, *31*, 509–522, doi: 10.1002/rcm.7824

F. Wang, X. Zhao, **C. Gerlein-Safdi**, Y. Mu, D. Wang, and Q. Lu, 2017. Global sources, emissions, transport and deposition of dust and sand and their effects on the climate and environment: a review, *Frontiers in Environmental Science and Engineering*, *11*:13, doi: 10.1007/s11783-017-0904-z

E. Chang, A. Wolf, **C. Gerlein-Safdi**, and K.K. Caylor, 2016. Improved removal of VOCs for laser-based spectroscopy of water isotopes, *Rapid Communications in Mass Spectrometry*, *30*, 784–790, doi: 10.1002/rcm.7497

Articles to be submitted

C. Gerlein-Safdi and G. Keppel-Aleks. Understanding the SIF response of vegetation to changes in soil moisture availability by combining process-based models and remote sensing data.

FELLOWSHIPS, AWARDS, AND RESEARCH GRANTS

2017 – 2020	Postdoctoral fellowship, Michigan Society of Fellows
2014 – 2017	Earth and Space Science Graduate Fellowship, NASA
2016 – 2017	Strategic University Research Partnerships Program, NASA Jet Propulsion Lab
2016 – 2017	Mary and Randall Hack '69 Graduate Award, Princeton Environmental Institute
2014 – 2016	Science, Technology & Environmental Policy Fellowship, Princeton Env. Institute

2016	AGU Travel Grant, American Geophysical Union
2014, 15, 16	Princeton School of Engineering and Applied Sciences Graduate Travel Award
2014, 15, 16	Princeton Civil and Environmental Engineering Departmental Travel Award
2014	Scholarship for the SPATIAL stable isotope short course (Uni. of Utah), NSF
2011	Mobility outside Europe Program Award, University of Strasbourg
2010	MSc. completion award from the Strasbourg Township
2009 – 2011	Bourse Boussole award for international study, Alsace Region
2009 – 2010	Erasmus scholarship for international study, French Ministry of Education

CONFERENCE, WORKSHOP, AND INVITED PRESENTATIONS

Oral Presentations

ESA 2020	C. Gerlein-Safdi , 2020, CYGNSS constellation provides new insight on tropical wetlands dynamics, August 2020, 2020 Ecological Society of America Annual Meeting, <i>invited talk for session OOS-39</i> , online meeting
CYGNSS STM	C. Gerlein-Safdi , 2020, Monitoring short-term variations in tropical wetland extent with CYGNSS, June 2020, CYGNSS Science Team Meeting, online meeting
Ohio State seminar series	C. Gerlein-Safdi , 2020, Plant water resources and their importance for vegetation carbon uptake, February 2020, School of Earth Science, The Ohio State University, Columbus, OH
INSTAAR seminar series	C. Gerlein-Safdi , 2020, Plant water resources and their importance for vegetation carbon uptake, January 2020, Institute of Arctic and Alpine Research, University of Colorado, Boulder, CO
Penn State Geosciences seminar series	C. Gerlein-Safdi , 2020, Plant water resources and their importance for vegetation carbon uptake: from the leaf to the global scale, January 2020, Dept. of Geosciences, Penn State, State College, PA
AGCI	C. Gerlein-Safdi , 2019, Remote sensing for environmental monitoring, August 2019, Aspen Global Change Institute, Basalt, CO
CYGNSS STM	C. Gerlein-Safdi , 2019, Improved global seasonal water masks with CYGNSS, June 2019, CYGNSS Science Team Meeting, Ann Arbor, MI
UMich CEE EWRE seminar series	C. Gerlein-Safdi , 2019, Canopy Interception: Understanding leaf wetness and its influence on vegetation water and carbon fluxes, January 2019, Environmental Engineering and Water Resources Seminar Series, CEE department, University of Michigan, Ann Arbor, MI
CYGNSS STM	C. Gerlein-Safdi , 2019, CYGNSS sensitivity to leaf surface wetness, January 2019, CYGNSS Science Team Meeting, Pasadena, CA
AGU Fall Meeting 2018	C. Gerlein-Safdi , 2018, Estimating canopy rainfall interception using the CYGNSS satellite constellation, Abstract H32B-06, December 2018, 2018 American Geophysical Union Fall Meeting, Washington D.C.

Society of Fellows Colloquium	C. Gerlein-Safdi , 2018, Water and trees: a space-borne perspective, December 2018, Michigan Society of Fellows Colloquium, University of Michigan, Ann Arbor, MI
UCI CEE Seminar Series	C. Gerlein-Safdi , 2018, Canopy interception: the influence of leaf wetness on vegetation water and carbon fluxes, November 2018, Environmental Engineering Seminar Series, CEE department, UC Irvine, Irvine, CA
2018 GLS Symposium	C. Gerlein-Safdi , 2018, Transpiration suppression from dew deposition on leaves, September 2018, 2018 Green Life Sciences Symposium, Ann Arbor, MI
MUSE Conference 2018	C. Gerlein-Safdi , 2018, Using remote sensing to estimate the effects of reforestation policy in the fight against desertification in China, February 2018, Michigan University-wide Sustainability and Environment Conference 2018, Ann Arbor, MI
AGU Fall Meeting 2017	C. Gerlein-Safdi , 2017, Effects of dew deposition on transpiration and carbon uptake in leaves, Abstract B21K-08, December 2017, 2017 American Geophysical Union Fall Meeting, New Orleans, LA
CLaSP Seminar Series	C. Gerlein-Safdi , 2017, Investigating dew deposition on leaves: effects on leaf water content, CO ₂ , and remote sensing characterization, November 2017, Climate and Space Sciences and Engineering Seminar Series, University of Michigan, Ann Arbor, MI
MUSE Workshop	C. Gerlein-Safdi , 2017, Environmental spatial data from remote sensing, November 2017, Michigan University-wide Sustainability and Environment Workshop Series, University of Michigan, Ann Arbor, MI
Society of Fellows Colloquium	C. Gerlein-Safdi , 2017, Understanding the effects of dew deposition on plants with stable isotopes of water, October 2017, Michigan Society of Fellows Colloquium, University of Michigan, Ann Arbor, MI
ELS XVI	C. Gerlein-Safdi , 2017, Microwave scattering by a dew-wetted leaf, 16 th Electromagnetic and Light Scattering Conference, March 2017, College Park, MD
AGU Fall Meeting 2016	C. Gerlein-Safdi , 2016, Taking Up the Torch: Emerging Issues in Tropical Ecohydrology from Early Career Scientists, Water Sciences Pop-Up Session, 2016 American Geophysical Union Fall Meeting, San Francisco, CA
FFCD 2016	C. Gerlein-Safdi , 2016, Dew deposition effects on leaf water isotopic enrichment from an energy balance perspective, 7th International Conference on Fog, Fog Collection and Dew, July 2016, Wroclaw, Poland
EEWR Seminar Series	C. Gerlein-Safdi , 2015, Water status of hydrophobic leaves improved by the impact of artificial dew deposition on leaf energy balance, Environmental Engineering and Water Resources Seminar Series, March 2015, Civil and Environmental Engineering Department, Princeton University, Princeton, NJ
EEWR Seminar Series	C. Gerlein , 2014, Mapping tree roots using ground penetrating radar, Environmental Engineering and Water Resources Seminar Series, April 2014, Civil and Environmental Engineering Department, Princeton University, Princeton, NJ

First Workshop on Water Vapor Isotopes	C. Gerlein , 2013, Isotopic equilibrium between precipitation and water vapor: evidence from continental rains in central Kenya, First International Workshop on Advances in Observations, Models and Measurements Techniques of Atmospheric Water Vapor Isotopes, Oct. 2013, CNRS, Gif-sur-Yvette, France.
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Poster Presentations

AGU Fall Meeting 2019	C. Gerlein-Safdi , R. Zwolinski, and C.S. Ruf, 2019, New algorithm for the generation of global CYGNSS-based watermarks detects short-term flooding and lake dry-out, AGU abstract H23O-2118, 2019 American Geophysical Union Fall Meeting, San Francisco, CA
US – China Forum 2019	C. Gerlein-Safdi , G. Keppel-Aleks, F. Wang, S.E. Frohling, and D. Mauzerall, 2019. Satellite monitoring of natural reforestation efforts in China’s drylands, 2019 US – China Environment and Sustainability Forum, Ann Arbor, MI
AGU Fall Meeting 2016	C. Gerlein-Safdi , S.E. Frohling, K.K. Caylor, 2016, Characterization of canopy dew formation in tropical forests using active microwave remote sensing, AGU abstract B33F-0681, 2016 American Geophysical Union Fall Meeting, San Francisco, CA
AGU Chapman Conference 2016	C. Gerlein-Safdi , S.E. Frohling, K.K. Caylor, 2016, Satellite and model-based characterization of canopy dew formation in tropical forests, AGU abstract 94662, 2016 American Geophysical Union Chapman Conference on Emerging Issues in Tropical EcoHydrology, Cuenca, Ecuador
AGU Fall Meeting 2015	C. Gerlein-Safdi , C. Sinkler, K.K. Caylor, 2015, Foliar shielding: how non-meteoric water deposition helps leaves survive drought by reducing incoming energy, AGU abstract A33H-0273, 2015 American Geophysical Union Fall Meeting, San Francisco, CA
AGU Fall Meeting 2015	E. Chang, K.K. Caylor, C. Gerlein-Safdi , A. Wolf, 2015, Solid phase extraction using C-18 sorbents to treat organics in water and eliminate spectral interference in isotope ratio infrared spectroscopy, AGU abstract PP11B-2246, 2015 American Geophysical Union Fall Meeting, San Francisco, CA
Harvard 10 th Annual PBI Symposium	C. Gerlein-Safdi , K.K. Caylor, C. Sinkler, 2015, The impact of dew deposition on the leaf energy and water cycles, 10 th Annual Plant Biology Initiative Symposium, Harvard University, Cambridge, MA
AGU Fall Meeting 2014	C. Gerlein-Safdi , C. Sinkler, K.K. Caylor, 2014, Modeling foliar uptake in <i>Colocasia esculenta</i> using high resolution maps of leaf water isotopes, AGU abstract H31G-0684, 2014 American Geophysical Union Fall Meeting, San Francisco, CA
AGU Fall Meeting 2014	C. Sinkler, C. Gerlein-Safdi , K.K. Caylor, 2014, Creating high-resolution maps of leaf water isotopes using IM-CRDS and IRMS techniques, AGU abstract PP31D-1177, 2014 American Geophysical Union Fall Meeting, San Francisco, CA
AGU Fall Meeting 2013	C. Gerlein , K. Soderberg, K.K. Caylor, 2013, Isotopic equilibrium between precipitation and water vapor: evidence from continental rains in central Kenya, AGU abstract GC13A-1057, 2013 American Geophysical Union Fall Meeting, San Francisco, CA
AGU Fall Meeting 2013	C. Gerlein , A. Wolf, K.K. Caylor, 2013, Stable isotopes in plant physiology: using water isotopes to study water fluxes in a temperate forest, AGU abstract H33A-1331, 2013 American Geophysical Union Fall Meeting, San Francisco, CA

AGU Meeting of the Americas 2013	C. Gerlein, F.C. O'Donnell, A. Bhattachan, K.K. Caylor, 2013, Ground penetrating radar measurements show a spatial relationship between coarse root biomass and soil carbon abundance, AGU abstract B43A-07, 2013 American Geophysical Union Meeting of the Americas, Cancún, Mexico
AGU Fall Meeting 2012	F.C. O'Donnell, C. Gerlein, A. Bhattachan, K.K. Caylor, 2012, Ground penetrating radar measurements show a spatial relationship between coarse root biomass and soil carbon abundance, EOS Trans AGU, 93(52), Fall Meet. Suppl., Abstract B23A-0431
AGU Fall Meeting 2009	M. Lapôtre, C. Gerlein, C. Huber, J. Watkins and M. Manga, 2009, Deformation of a buoyant bubble at low Reynolds number, a model of interaction between a plume head and a subducting slab, AGU abstract T13B-1867, 2009 American Geophysical Union Fall Meeting, San Francisco, CA

PROFESSIONAL ORGANIZATIONS

- AGU – American Geophysical Union, 2009 to present
- SACNAS – Society for the Advancement of Latinos/Chicanos and Native Americans in Science, 2018 to present

ACADEMIC SERVICES

- AGU early career representative for the 2022 Frontiers in Hydrology Program Committee (2020 – present)
- AGU Ecohydrology Technical Committee Member, chair of the early career relations subcommittee (2018 – present)
- Diversity, Equity, and Inclusion Chair, University of Michigan Postdoctoral Association (elected position, 2019 – 2020)
- Journal reviewer: Agricultural and Forest Meteorology, Agricultural Water Management, American Journal of Botany, Biogeosciences, Earth's Future, Ecohydrology, Ecology & Society, Hydrology and Earth System Sciences (HESS), Journal of Hydrology, Journal of Geophysical Research (JGR) - Atmospheres, New Phytologist, Plant and Soil, Plant Biology, Rapid Communications in Mass Spectrometry, Remote Sensing, Trees, Water Resources Research (WRR), WIREs Water
- 2019 AGU Editors' Citation for Excellence in Refereeing for *Earth's Future*
- Conference chair:
 - 2017 AGU Fall Meeting, Chair, Session A11F, Early On-Orbit Results of the Cyclone Global Navigation Satellite System
 - 2018 Michigan University-wide Sustainability and Environment Conference, Chair, Land use and land cover change session
- Judge and reviewer for proposals, conferences, and awards:
 - NASA Earth Science Division Review Panel, reviewer (twice in 2020)
 - SACNAS Research Presentation reviewer (2018, 2019)
 - SACNAS Travel Scholarship reviewer (2018, 2019)
 - University of Michigan Outstanding Postdoctoral Fellow Award judge (2019)
 - University of Michigan Distinguished Dissertation Awards reviewer (2018, 2019)
 - Michigan Geophysical Union, University of Michigan judge (2018, 2019)
 - Undergraduate Research Opportunity Program's (UROP) Annual Research Spring Symposium, University of Michigan judge (2018, 2019)
 - University of Michigan Society of Fellows Application reviewer (2017, 2018)
 - Michigan Engineering Graduate Symposium reviewer and judge (2018)
- Student representative for EOST Board of Directors (2008 – 2011)

- ∩ **Climate 749: CLaSP Seminar**, University of Michigan, AY 2019/2020, *Instructor*
- ∩ **CLaSP 405: Remote Sensing**, University of Michigan, Winter 2020, *Guest lecture*
- ∩ **ENSCI 698: Environmental Science Seminar**, Iowa State University, Spring 2019, *Guest*
- ∩ **Association for Women in Science**, University of Michigan, AY 2018/2019, *Mentoring circle*
- ∩ **CLaSP Peer Mentoring Program**, University of Michigan, AY 2018/2019, *Mentor*
- ∩ **Residential graduate student**, Forbes College, Princeton University, AY 2014/2015: organized a year long *Sustainability and the Environment activity series* for the College
- ∩ **FRS125: Global Environmental Change: Science, Technology and Policy**, Princeton University, Fall 2013, *Graduate Instructor*
- ∩ **Introductory programming class for high school girls** (9th and 10th grade), New York City Girls Computer Science and Engineering Conference, April 2013, *Princeton University Graduate Women in Science and Engineering (GWISE) volunteer*
- ∩ **Research mentoring**: Raina Zwolinski (University of Michigan, Undergraduate Research Opportunity Program, AY 2019/2020), Elliot Chang (Princeton University, senior thesis, 2016), Connor Duwan (Princeton University, summer intern, 2015), Craig Sinkler (Princeton University, summer intern, 2014), James O'Donnell (Princeton University, summer intern, 2014)

NEWS ARTICLES, PRESS, AND MEDIA COVERAGE

- ∩ “Time Is Running Out to Save the Last of the World’s Rainforest” by Adam Majendie, Pablo Robles, Kevin Varley, Adrian Leung, and Hannah Dormido, **Bloomberg Green**, 09/14/2020 ([link](#))
- ∩ “Data Illuminate a Mountain of Molehills Facing Women Scientists” by Julia Rosen, **EOS**, 01/27/2017 ([link](#))

REFERENCES

- ∩ **Prof. Kelly K. Caylor** (PhD advisor)
Director, Earth Research Institute
Professor, Bren School of Environmental Science & Management and Department of Geography
University of California, Santa Barbara
6812 Ellison Hall, Santa Barbara, CA 93106, USA
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- ∩ **Prof. Chris Ruf** (postdoc advisor)
Frederick Bartman Collegiate Professor of Climate and Space Science
University of Michigan
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- ∩ **Prof. N. Michele Holbrook** (collaborator)
Professor of Organismic and Evolutionary Biology
Charles Bullard Professor of Forestry
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γ **Prof. Sally Thompson** (collaborator)
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35 Stirling Highway, Crawley WA 6009, Perth, Australia
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γ **Prof. Gretchen Keppel-Aleks** (collaborator)
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FIELD CAMPAIGNS

- γ **Silas Little Experimental Forest, NJ, USA**, Summer 2013, *8 weeks*
In-situ measurement of the isotopic composition of xylem water.
- γ **Mpala Research Center, Laikipia County, Kenya**, April 2011, *4 weeks*
Mapping soil moisture on an hill slope using ground penetrating radar (GPR) and electromagnetic induction (EMI).
- γ **Montpellier, France**, October 2010, *1 week*
Borehole geophysics and hydrology.
- γ **Rittershoffen/Pechelbronn, Alsace, France**, September 2010, *1 week*
Subsurface geophysics: seismic reflection, gravimetry, resistivity, magnetic and EM methods
- γ **Digne-les-Bains, Alpes-de-Haute-Provence, France**, May 2009, *10 days*
Sedimentary petrology, facies analysis, deposition environments, stratigraphy, paleontology, cartography, tectonics, alpine geology and geomorphology.

TECHNICAL SKILLS

- γ **Stable Isotope Ecology and Biogeochemistry short courses at the University of Utah:** IsoCAMP (2013), SPATIAL (2014)
- γ **Programming:** Python, C, Fortran
- γ **Numerical Computing:** Matlab, Mathematica, Maple
- γ **Applications:** GIS Training (Princeton University Workshop, Spring 2013), Panoply, SEEP/W 2007, AutoCAD Civil 3D, Petrel, Processing Modflow, 3D Master (3D Groundwater Explorer)

LANGUAGES

French	Native speaker
Spanish	Native speaker
English	Fluent
German	Excellent command: bilingual high school, ten years of German classes. June 2006: Allgemeine Hochschulreife (<i>Abitur</i> , German high school graduation).