Madeleine Pascolini-Campbell

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Research scientist with 10+ years experience in geospatial data (remote sensing, model output, in situ observations). Expert in remote sensing, including algorithm development from thermal infrared (evapotranspiration and water stress). Expertise working with optical, thermal infrared, imaging spectroscopy, gravity-based remote sensing, LiDAR (MODIS, Landsat, ECOSTRESS, EMIT, GRACE/GRACE-FO, GEDI). Domain area expertise in hydrology and wildfire science including pre-fire fuel mapping and wildfire prediction using machine learning. Expert in scientific programming and coding tools (Python, Matlab, Terminal, Github). Mission Applications Lead for ECOSTRESS, involved in working with stakeholders across government labs, academia, nonprofits, and industry to translate NASA's Earth science capabilities into real-world applications. JPL center lead for the NASA FireSense Implementation Team, and Science Lead for Google.org AI Collaborative funded activity on wildfires.

Appointments:

2021 – present **Scientist,** NASA Jet Propulsion Laboratory
2020 – 2021 **JPL postdoc,** NASA Jet Propulsion Laboratory
2018 – 2020 **NASA Postdoctoral Program Fellow**, NASA Jet Propulsion Laboratory

Professional Experience:

Lead Evapotranspiration Developer for NASA Airborne Thermal Infrared Missions (HyTES, MASTER) 2024 – present
NASA JPL
Lead algorithm developer to derive evapotranspiration from thermal infrared (TIR) data for NASA airborne sensors. Algorithms are currently employed for the HyTES and MASTER airborne instruments to automatically generate products (cloud-optimized-GeoTIFF and HDF5) using TIR and ancillary optical and weather data.

Science Implementation & Imaging Spectroscopy Product Lead 2025 – present
California Institute of Technology / NASA JPL
Science Implementation Lead for Google AI Wildfire Collaborative "FIRE-MAPS" (Fire Intelligence and Risk Evaluation – Maturing Algorithm Products from Space) building vegetation fuel maps using imaging spectroscopy and synthetic-aperture-radar. Leading validation of fuel-moisture products against airborne-derived water content using in situ dead fuel and live fuel moisture.

NASA Wildland Fires FireSense Implementation JPL Team Center Lead 2024 – present
NASA JPL
PI on project "*Harmonics of stress and structure from ECOSTRESS and GEDI to support pre-fire mapping and the management of fire trajectories*" which will produce wall-to-wall vegetation structure and water stress maps using GEDI LiDAR and ECOSTRESS TIR.

Surface Biology and Geology, TIR Low Latency Algorithms Lead 2023 – 2025
NASA *JPL*
Project lead for low latency TIR algorithms from Level-1 radiance, Level-2 land surface temperature and emissivity, Level-3 Evapotranspiration and Ecosystems, Level-3 Geology, Level-4 Elevated Temperature Features. Overseeing algorithm development, requirements, uncertainty, latency.

ECOSTRESS Mission Applications Lead 2023 – present
NASA JPL
Leading engagement with stakeholders across government labs, academia, nonprofits, and industry to translate ECOSTRESS data and science capabilities into real-world applications.

Fellowships and awards:

2024 **NASA Early Career Achievement Medal**
2020 **Jet Propulsion Laboratory Postdoc Research Day Award**
2018 **NASA Postdoctoral Program Fellowship**
2015 **Graduate Research Fellowship, National Science Foundation**

Education:

2018 PhD, Columbia University
2011 BA, University of Cambridge

Publications:

Ward-Baranyay, M., Lee, C., **Pascolini-Campbell, M**., Sousa, D., & Kinoshita, A. M. (2026). Pre-fire fuel conditions are dominant drivers of burn severity in the 2025 Los Angeles County fires. *AGU Advances*, *7*(2), e2025AV002179. https://doi.org/10.1029/2025AV002179Digital

Pascolini-Campbell, M., Fisher, J. B., Hall, J. V., Rivera, M., Lee, C. M., Thompson, J. O., ... & Baijnath-Rodino, J. (2026). Wildfires: TIR for Monitoring Active Fires, Pre-Fire Fuels, and Post-Fire Recovery. In *High Spatio-Temporal-Spectral Thermal Remote Sensing* (pp. 109-127). CRC Press. Book available online.

Dandapanthula, S., Johnson, M., **Pascolini-Campbell, M**., Hulley, G., & Kuusela, M. (2026). Downscaling land surface temperature data using edge detection and block-diagonal Gaussian process regression. Submitted Climate Informatics. Preprint https://doi.org/10.48550/arXiv.2602.02813

Alamillo, A., Li, J., Farahmand, A., **Pascolini-Campbell, M.**, & Lee, C. (2025). Post-Fire Vegetation Recovery Response: A Case Study of the 2020 Bobcat Fire in Los Angeles, California. *Remote Sensing*, *17*(24), 4023. https://doi.org/10.3390/rs17244023

Chadwick, K. D., Davis, F., Miner, K. R., Pavlick, R., Reynolds, M., Townsend, P. A., ... & Schimel, D. (2025). Unlocking ecological insights from sub-seasonal visible-to-shortwave infrared imaging spectroscopy: The SHIFT campaign. *Ecosphere*, *16*(3), e70194. https://doi.org/10.1002/ecs2.70194

Pascolini-Campbell, M., Fisher, J. B., Cawse-Nicholson, K., Lee, C. M., & Stavros, N. (2025). Assessment of spatial autocorrelation and scalability in fine-scale wildfire random forest prediction models. *Scientific Reports*, *15*(1), 21504. https://doi.org/10.1038/s41598-025-06814-z

Joshi, R., Jensen, A., **Pascolini-Campbell, M.** and J. B. Fisher Coupling between evapotranspiration, water use efficiency, and evaporative stress index strengthens after wildfires in New Mexico, USA, (2024) International Journal of Applied Earth Observation and Geoinformation, 135, 104238. https://doi.org/10.1016/j.jag.2024.104238

Jarugula, S., Fournier, S., Reager, J. T., & **Pascolini-Campbell, M.** (2025). Intercomparison of in situ and satellite sea surface salinity products for global coastal ocean studies. *Journal of Atmospheric and Oceanic Technology*, *42*(1), 3-16. https://doi.org/10.1175/JTECH-D-23-0168.1

Pierrat, Z. A., Purdy, A. J., Halverson, G., Fisher, J. B., Mallick, K., **Pascolini-Campbell, M.,** ... & Cawse-Nicholson, K. (2025). Evaluation of ECOSTRESS Collection 2 evapotranspiration products: Strengths and uncertainties for evapotranspiration modeling. *Water Resources Research*, *61*(6), e2024WR039404. https://doi.org/10.1029/2024WR039404

M. Pascolini-Campbell, Hook, S., Mallick, K., Langsdale, M., Hulley, G., Cawse-Nicholson, K., Hu, T., Halverson, G., Freepartner, R., Rivera, G., Genesio, L. and Rabuffi, F. (2024) "A First Assessment of Airborne HyTES-based Land Surface. Temperature and Evapotranspiration", Remote Sensing Applications Society and Environment, *36*, 101344. https://doi.org/10.1016/j.rsase.2024.101344

Byrne, B., Liu, J., Bowman, K., **Pascolini-Campbell, M.,** Chatterjee, A., Pandey, S., Miyazaki, K., van der Werf, G., Wunch, D., Wennberg, P., Roehl, C. and S. Sinha, Carbon emissions from the 2023 Canadian wildfires, *Nature* (2024). https://doi.org/10.1038/s41586-024-07878-z

Parazoo, N. C., Osman, M., **Pascolini-Campbell, M.**, & Byrne, B. (2024). Antecedent Conditions Mitigate Carbon Loss During Flash Drought Events. *Geophysical Research Letters*, *51*(8), e2024GL108310. https://doi.org/10.1029/2024GL108310

Boser, A., Caylor, K., Larsen, A., **Pascolini-Campbell, M**., Reager, J. T., Carleton, T. Field-scale crop water consumption estimates reveal potential water savings in California agriculture, 2024, *Nature Communications*, *15*(1), 2366. https://doi.org/10.1038/s41467-024-46031-2

Simafranca, N., Willoughby, B., O'Neil, E. Farr, S., Reich, B. J., Giertych, N., Johnson, M., **Pascolini-Campbell, M.** (2024), Modelling wildland fire burn severity in California using a spatial super learner approach, *2024*, Environmental and Ecological Statistics, https://doi.org/10.48550/arXiv.2311.16187

Fournier, S., Reager, J. T., Chandanpurkar, H., **Pascolini-Campbell, M. A**., S. Jarugula, The salinity of coastal waters as a bellwether for global water cycle changes, 2023, Geophysical Research Letters, *Geophysical Research Letters*, *50*(24), e2023GL106684 https://doi.org/10.1029/2023GL106684

M. Pascolini-Campbell and J. T. Reager, An Investigation of the spatial and temporal characteristics of dry and wet extreme events across NLDAS-2 models, 2023*, Journal of Hydrometeorology,* https://doi.org/10.1175/JHM-D-23-0038.1

Tian Hu, Kaniska Mallick, Patrik Hitzelberger, Yoanne Didry, Gilles Boulet, Zoltan Szantoi, Benjamin Koetz, Itziar Alonso, **M. Pascolini-Campbell**, Gregory H Halverson, Kerry Cawse-Nicholson, Glynn Hulley, Simon J. Hook, Nishan Bhattarai, Albert Olioso, Jean-Louis Roujean, Philippe Gamet, Z. Bob Su, Evaluating European ECOSTRESS Hub Evapotranspiration Products Across a Range of Soil-Atmospheric Aridity and Biomes over Europe. *Water Resources Research*, e2022WR034132. https://doi.org/10.1029/2022WR034132

Pascolini-Campbell, M. Soil and plants lose more water under drought. *Nature Climate Change – News and Views* (2022). https://doi.org/10.1038/s41558-022-01510-6

Pascolini-Campbell, M., Lee, C., Stavros, N. & Fisher, J. B. (2022). ECOSTRESS reveals pre-fire vegetation controls on burn severity for Southern California wildfires of 2020. *Global Ecology and Biogeography*, 31, 1976– 1989. https://doi.org/10.1111/geb.13526

Raymond., C., Suarez-Gutierrez, L., Kornhuber, K., **Pascolini-Campbell, M.**, Sillmann, J. and D. E. Waliser "Increasing spatiotemporal proximity of heat and precipitation extremes in a warming world quantified by a large model ensemble", 2022, *Environmental Research Letters*, *17*(3), 035005. DOI: 10.1088/1748-9326/ac5712

Pascolini-Campbell, M., Fisher, J. B. & J. T. Reager "GRACE-ECOSTRESS synergies constrain fine-scale impacts on large-scale water balance", *2021, Geophysical Research Letters, 48*(15), e2021GL093984. DOI: 10.1029/2021GL093984

Pascolini-Campbell, M., Reager, J. T., & Fisher, J. B. "GRACE-based mass conservation as a validation target for basin-scale evapotranspiration in the contiguous United States". *Water Resources Research (2020)*, 56, e2019WR026594. https://doi.org/10.1029/2019WR026594 DOI: 10.1029/2019WR026594

Pascolini-Campbell, **M.,** Seager, R., Cook, B.I. and P. Williams "Dynamics and variability of the spring dry season in the United States Southwest as observed in AmeriFlux and NLDAS-2 data"*, J. Hydrometeorology* (2019): **20**, 1081–1102

Pascolini-Campbell, M., Seager, R. Cook, B. I and Pinson, A. "Covariability of climate and streamflow in the Upper Rio Grande from interannual to decadal timescales", *Journal of Hydrology: Regional Studies* 13 (2017): 58-71.

Pascolini-Campbell, M., Seager, R., Cook, B.I., Griffin, D. and D. Gutzler "Causes of interannual to decadal variability of Gila River streamflow over the past century." *Journal of Hydrology: Regional Studies* 3 (2015): 494-508.

Pascolini-Campbell, M., Zanchettin, D., Bothe, O., Timmreck, C., Matei, D., Jungclaus, J. H., & Graf, H. F. (2015). Toward a record of Central Pacific El Niño events since 1880. *Theoretical and Applied Climatology*, 119(1-2), 379-389.

Publications (in preparation):

Pascolini-Campbell, M., Bohn, N., Lou, Y., An, K., Rolla, J., Peacock, A., Chen, R., Miner, K., Frankenberg, C. and F. Seidel "Synergies between Imaging Spectroscopy and SAR for assessing pre- and post-fire fuel conditions" *Manuscript in preparation*

Pascolini-Campbell, M., French, N., Wang, J. et al. Gaps, opportunities and future technology needs for wildfire science and applications for the next Decadal Survey, *Manuscript in preparation*

E Tajfar, **Pascolini-Campbell, M.**, Hakuba, M., Reager, J.T., David, C., and Landerer, F. Higher Terrestrial Water Storage Capacity Sustains Evapotranspiration and Latent Cooling During Drought in Mississippi River Sub-Basins, Under Review, Water Resources Research

Technical Documents:

Pascolini-Campbell, M. MODIS/ASTER (MASTER) L-3 Data Product User Guide, Jet Propulsion Laboratory, D-111669 https://masterprojects.jpl.nasa.gov/downloads/docs/MASTER_L3_ET_UserGuide_20251023.pdf

Pascolini-Campbell, M. MODIS/ASTER (MASTER) L-3 Data Evapotranspiration L3 (ET) Algorithm Theoretical Basis Document, Jet Propulsion Laboratory, D-111714 https://masterprojects.jpl.nasa.gov/downloads/docs/MASTER_L3-ET_ATBD_V1.pdf

Proposals (as PI and Science-PI):

NASA Innovate *FIRE-WUI: AI-Powered Wildfire Risk Intelligence for Utilities Bridging the Resolution Gap in the Wildland-Urban Interface, Lead JPL Co-I, Notice of award April 2026*

NASA FireSense *Harmonics of stress and structure from ECOSTRESS and GEDI to support pre-fire mapping and the management of fire trajectories. Awarded 2025, PI (2025 – 2028)*

NASA MOSAICS *CONNECT-SBG: Collaborative Nexus for Networking, Education, and Career Training in Surface Biology and Geology, Awarded 2024*, JPL-PI (2024 – 2026)

NASA ECOSTRESS Science Team *'Fire Driven Changes in Landscape Water Use' Awarded 2022* PI (2022 – 2025)

NASA Wildland Fires Program '*Predicting Wildfires and Active Fire Tracking'* Awarded 2022, PI (2022 – 2024)

ROSES Ocean Salinity Science Team *'Coastal salinity; a proxy for human and natural terrestrial hydrology changes' Awarded 2022***,** Science PI (Severine Fournier, PI) (2022 – 2026)

NASA Postdoctoral Program Fellowship, *Awarded 2018*,
"Measuring human impacts on the global water and energy cycle using GRACE and SMAP"

Step 1 Proposals Selected

NASA Commercial Satellite Data Acquisition Step 1, *invited to Step 2***,** PI
'High Resolution Wildfire Modeling in the Wildland-Urban-Interface' 2025
Step 2 not selected.

NASA SERVIR Step 1, *invited to Step 2***,** PI
'Fire Risk from Plant Water Stress in Amazonia' 2022
Step 2 not selected.

Proposals (Co-I):

NASA GRACE Science Team Water cycle events in the global mass budget, 2024 (JT Reager, PI) 2024 – 2027

NASA Earth Science to Action Supporting Resilience Design work in Regenerative Agriculture, 2024 (Carmen Blackwood, PI) 2024 - 2027

Media:

2022 USGS Eyes on Earth Podcast:

https://www.usgs.gov/centers/eros/science/eyes-earth-episode-83-ecostress-and-burn-severity

2022 Wildfire prediction with ECOSTRESS:

https://www.nasa.gov/feature/jpl/nasa-data-on-plant-sweating-could-help-predict-wildfire-severity/

Selected Presentations:

Pascolini, M., Lee, C., Fisher, J. B. ECOSTRESS Applications: Wildfire, Geology and Coastal Water Quality, *Guest Lecture, Chapman University, October 2023*

Pascolini, M., Lee, C., Fisher, J. B., Stavros, N., Thermal Infrared Remote Sensing Applications for Wildfire Science, *Invited Talke, Ameriflux Year of Remote Sensing, April 2023*

Pascolini, M., Parazoo, N., and C. Lee Potential Applications of OCO-2 data: drought, wildfires, forest management and carbon budgets, *OCO Science Team Meeting*, Pasadena, April 2023

Pascolini, M., Raymond, C., Lee, C., and N. Parazoo, Landscape-Driven Changes in Vegetation and Water Use due to California Wildfires, *ECOSTRESS Science Team Meeting*, November 2022

Pascolini-Campbell, M. Reager, J. T., Chandanpurkar, H., Roddell, M., Fisher, J.B.F. "A recent increase in global land evapotranspiration, and human impacts on the water cycle", American Geophysical Union Fall Meeting, *December 2021, (*Invited speaker)

Pascolini-Campbell, M., Lee, C. Stavros, N. & Fisher, J.B.F. "ECOSTRESS reveals pre-fire burn conditions for 2020 California Wildfires", American Geophysical Union Fall Meeting, *December 2021, (Oral Presentation)*

***Pascolini-Campbell, M.**, Lee, C., Fisher, J. B. & Stavros, N. "*The use of remote sensing-based ET and evaporative stress index to assess pre and post fire vegetation status" Tactical Fire Remote Sensing Advisory Committee, U.S. Forest Service and NASA, November 2020

Pascolini-Campbell, **M.,** Reager, J. T., & Fisher, J. B. "GRACE-based mass conservation as a validation target for basin-scale evapotranspiration in the contiguous United States". AGU Fall Meeting*, December 2019 (Oral Presentation)*

Pascolini-Campbell, M., Seager, R., Cook, B.I. and P. Williams "Dynamics and Variability of the Spring Dry Season in the United States Southwest", AGU Fall Meeting, December 2017 (Oral Presentation)

Teaching and mentoring:

2026 – present Mentor to Nasa Postdoctoral Fellow on WRF-Fire spread modeling and fuel sensitivity assessment

2025 – present Mentoring 5 NASA MOSAICS funded interns from Chapman University to use thermal infrared and visible-shortwave infrared imaging spectroscopy, including development of mentorship plans

2025 – present Mentoring NASA Develop program on prescribed burn monitoring using remote sensing

2022 – pres. Postdoc co-mentor on water and energy balance using GRACE, CERES satellite observations.

2022 – pres. Mentor for 3 ECOSTRESS interns on wildfire recovery, Amazon wildfire prediction and New Mexico fire prediction

2022 2 Terms: Co-mentor for team of 5 interns in NASA Develop (Applied Science program) for a joint project with Tennessee-based non-profit 'Protect our Aquifer'

2021 Co-mentoring JPL summer intern June – August 2021 on using ECOSTRESS satellite data to monitor irrigation in California

2014 - 2016 Teaching Assistant, Columbia University

Review Activities:

Ongoing Journal reviewer for *AGU Advances, Nature Geoscience, Water Resources Research, Journal of Remote Sensing, Geophysical Research Letters, Journal of Geophysical Research – Atmosphere*

2026 Proposal panelist, NASA ROSES Review Panel

2021 Proposal panelist, NASA ROSES Review Panel

2020 Proposal panelist, NASA FINESST Review Panel