

# Patrick C Murphy

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## Education

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**University of Arizona** 2018

Master of Arts in Geography

Thesis title: Spatial and Temporal Influences on Primary Production in a Semiarid Forest

Committee: Dr. Greg A Barron-Gafford (advisor), Dr. Kevin J Anchukaitis, Dr. David JP Moore

**San Diego State University** 2013

Bachelor of Science in Environmental Sciences

## Professional Experience

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**Woodwell Climate Research Center** *June 2017 – Present*

Field Research Technician

Arranged and oversaw the deployment of a network of long-term eddy covariance sites across the Arctic.

Designed and built systems to ensure year-round data collection, power, and communication.

**University of Arizona – Sch. Geography, Development, & Environment** (0.1 FTE) *March 2019 – Present*

Field Technician

Managed repair, maintenance, and calibration of portable photosynthesis systems, eddy covariance sites, and other ecophysiological instruments.

**University of Arizona – Department of Geosciences** (0.9 FTE) *June 2017 – October 2022*

Lab Manager

Coordinated and supervised an organic geochemistry paleoclimate laboratory; repaired, maintained, and calibrated analytical instruments (GC- and LC-MS, continuous flow IRMS); oversaw data QA/QC and analysis; trained and mentored undergraduate, graduate, and postdoctoral researchers; ensured compliance with university and federal safety standards.

**San Diego State University – Global Change Research Group** *May 2011 – August 2015*

Lead Field Technician

Coordinated the deployment of eddy-covariance instruments across northern Alaska; installed, repaired, maintained, and calibrated instruments at multiple AmeriFlux sites in all seasons; oversaw data QA/QC and reporting to funding agencies; supervised other technicians and undergraduate students.

**University of California – San Diego Supercomputer Center** *June 2008 – May 2012*

Teaching and Programming Assistant

Assisted with education outreach workshops that provided public school teachers and students with training on a variety of software used in a modern academic computing environment.

## Teaching Experience

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### University of Arizona

Fall 2015, Fall 2016

#### Introduction to Physical Geography (GEOG 170A)

Teaching assistant with 80 students per semester. Taught weekly discussion sections, graded papers and exams, held office hours.

## Research Skills and Training

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- Extensive use of R language and environment (including RStudio and Shiny apps)
- CRBasic and Campbell Scientific datalogger installation
- Data processing and visualization using R, EddyPro, EdiRe, and MATLAB
- Experience, knowledge, and comfort with use of computer systems in a professional environment
  - Linux, macOS, and Windows operating systems
  - Networked instruments
  - Automated data collection, transfer, and storage
  - Remote administration
  - Website management
- WMAI Wilderness Advanced First Aid AND CPR certified 21 March 2023
- Li-Cor portable photosynthesis system training course 27 March 2019
- NSF-sponsored safety seminar for fieldwork in remote Arctic conditions 6 June 2014
- Li-Cor eddy covariance training course 21-23 May 2013
- Los Gatos Research greenhouse gas analyzer training seminar 11 May 2013

## Publications

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- Barron-Gafford, G. A., Knowles, J. F., Sanchez-Cañete, E. P., Minor, R. L., Lee, E., ... **Murphy, P. C.**, ... Scott, R. L. (2021). Hydraulic redistribution buffers climate variability and regulates grass-tree interactions in a semiarid riparian savanna. *Ecohydrology*, 14(3), e2271.  
<https://doi.org/10.1002/eco.2271>
- Murphy P. C.**, Knowles J. F., Moore D. J. P., Anchukaitis K., Potts D. L., Barron-Gafford G. A. (2020). Topography influences species-specific patterns of seasonal primary productivity in a semiarid montane forest. *Tree Physiology*, 40(10), 1343-1354.  
<https://doi.org/10.1093/treephys/tpaa083>
- Minor, J., Colella, T. R., Barnes, M., Mann, S., **Murphy, P. C.**, Pearl, J., Barron-Gafford, G. A. (2020). Critical Zone Science in the Anthropocene: Opportunities for biogeographic and ecological theory and praxis to drive earth science integration. *Progress in Physical Geography: Earth and Environment*, 44(1), 50-69.  
<https://doi.org/10.1177%2F0309133319864268>
- Barron-Gafford, G.A., Sánchez-Cañete, E. P., Minor, R. L., Hendryx, S. M., Lee, E., ... **Murphy, P. C.**, ... Scott, R. L. (2017). Impacts of hydraulic redistribution on grass–tree competition vs facilitation in a semi-arid savanna. *New Phytologist*, 215(4), 1451-1461.  
<https://doi.org/10.1111/nph.14693>
- Goodrich, J., Oechel, W. C., Gioli, B., Moreaux, V., **Murphy, P. C.**, Burba, G., Zona, D. (2016). Impact of different eddy covariance sensors, site set-up, and maintenance on the annual balance of CO<sub>2</sub> and CH<sub>4</sub> in the harsh Arctic environment. *Agricultural and Forest Meteorology*, 228-229, 239-251.  
<https://doi.org/10.1016/j.agrformet.2016.07.008>

Zona, D., Gioli, B., Commane, R., Lindaas, J., Wofsy, S. C., ... **Murphy, P. C.**, ... Oechel, W. C. (2016). Cold season emissions dominate the Arctic tundra methane budget. *Proceedings of the National Academy of Sciences*, 113(1), 40-45.  
<http://doi.org/10.1073/pnas.1516017113>

## Presentations (presenting author)

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- Murphy, P. C.**, & Barron-Gafford, G. A. (2021). Agrivoltaics as a cure for midday depression: Shade from PV provides respite for food crops in drylands, Abstract GC15G-0771 presented at 2021 AGU Fall Meeting, 13-17 Dec, Online.
- Murphy, P. C.**, Bhattacharya, T., Tierney, J. E. (2019). Species-specific leaf wax isotopic response to Sonoran Desert weather extremes, Abstract B53E-2454 presented at 2019 AGU Fall Meeting, 9-13 Dec, San Francisco, CA.
- Murphy, P. C.**, Bhattacharya, T., Gerdes, M., Tierney, J. E. (2018). Leaf wax isotopic response to seasonal changes in climate in the Sonoran Desert, Abstract B21M-0350 presented at 2018 AGU Fall Meeting, 10-14 Dec, Washington, DC.
- Murphy, P. C.**, Potts, D., Minor, R. L., Hamerlynck, E. P., Sutter, L., Barron-Gafford, G. A. (2017). Gauging leaf-level contributions to landscape-level water loss within a Western US dryland forest, Abstract GC21F-1000 presented at 2017 AGU Fall Meeting, 11-15 Dec, New Orleans, LA.
- Murphy, P. C.**, Minor, R. L., Sánchez-Cañete, E. P., Potts, D., Barron-Gafford, G. A. (2016). Seasonal and Topographic Variation in Net Primary Productivity and Water Use Efficiency in a Southwest Sky Island Forest, Abstract B11B-0456 presented at 2016 AGU Fall Meeting, 12-16 Dec, San Francisco, CA.
- Murphy, P. C.** (2016). Ecophysiological Responses of Southwest Sky Island Forests to Seasonal and Topographic Variability, Talk given to the Catalina-Jemez Critical Zone Observatory investigator group, 5 Dec, Tucson, AZ.
- Murphy, P. C.** (2016) Ecophysiological Responses of Southwest Sky Island Forests to Seasonal and Topographic Variability, Talk given to the 7<sup>th</sup> Mountain Climate Conference, 18 Oct, Leavenworth, WA.
- Murphy, P. C.**, Minor, R. L., Sánchez-Cañete, E. P., Potts, D., Barron-Gafford, G. A. (2016). Seasonal and Topographic Variation in Net Primary Productivity in a Southwest Sky Island Forest, Poster presented at the 13<sup>th</sup> USDA ARS Research Insights in Semiarid Ecosystems Symposium, 8 Oct, Tucson, AZ.
- Murphy, P. C.**, Minor, R. L., Sánchez-Cañete, E. P., Potts, D., Barron-Gafford, G. A. (2016). Spatio-temporal Controls on Productivity, Poster presented at the University of Arizona Arid Lands Consortium Symposium, 27 Apr, Tucson, AZ.
- Murphy, P. C.**, Oechel, W. C., Moreaux, V., Losacco, S., Zona, D. (2013). Expanding Spatial and Temporal Coverage of Arctic CH<sub>4</sub> and CO<sub>2</sub> Fluxes, Abstract B51E-0337 presented at 2013 AGU Fall Meeting, 9-13 Dec, San Francisco, CA.
- Murphy, P. C.**, Einhell, D., Kurimoto, W., Martin, C. (2013). Studying effects of land use change on water quality and flooding in an urban watershed, Presented at the San Diego State University Research Symposium, 8 Mar, San Diego, CA.
- Murphy, P. C.**, Ikawa, H., Oechel, W. C. (2012). Net Ecosystem Exchange Measurements of the Arctic Tundra, Abstract GC21A-0938 presented at 2012 AGU Fall Meeting, 3-7 Dec, San Francisco, CA.

## Professional Memberships

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- American Geophysical Union 2011 – Present
- North American Association of Environmental Professionals, San Diego chapter 2010 – 2015
- Phi Eta Sigma Honors Society at San Diego State University 2011 – 2013
- Enviro-Business Society 501(c)(3) at San Diego State University 2010 – 2013