KATHLEEN T. GRANT

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EDUCATION

University of Southern California Los Angeles, CA
Doctor of Philosophy, Earth Sciences Expected August 2024
University of Colorado at Boulder Boulder, CO
Bachelor of Arts, Geological Sciences May 2016

RESEARCH POSITIONS

JPL Visiting Student Researchers Program (2022-2024)

JPL Year Round Internship Program (2021)

AWARDED GRANTS

JPL Strategic University Research Partnership (SURP) Program (2023). Title: Detecting toxic metal contamination through imaging spectroscopy. Co-PI: K. Dana Chadwick, Role: JPL Scientist. Co-Investigator: A. Joshua West, Role: USC Sr. Scientist, Co-Investigator: **Kathleen Grant**, Role: USC PhD Candidate, $54,503

JPL Strategic University Research Partnership (SURP) Program (2022). Title: Detecting toxic metal contamination through imaging spectroscopy. Co-PI: K. Dana Chadwick, Role: JPL Scientist. Co-Investigator: A. Joshua West, Role: USC Sr. Scientist, Co-Investigator: **Kathleen Grant**, Role: USC PhD Candidate, $60,000

PUBLICATIONS

R. O. Green *et al.*, "Performance and Early Results from the Earth Surface Mineral Dust Source Investigation (EMIT) Imaging Spectroscopy Mission," *2023 IEEE Aerospace Conference*, Big Sky, MT, USA, 2023, pp. 1-10, doi: 10.1109/AERO55745.2023.10115851.

Mahowald, N. M., Li, L., Miller, R.L., Obiso, V., García-Pando, C.P., Ginoux, P., Thompson, D.R., Brodrick, P.G., **Grant, K.G.,** Green, R.O. (2022). Earth Mineral dust source InvesTigation (EMIT): EMIT L4 Algorithm: Radiative Forcing Theoretical Basis. https://earth.jpl.nasa.gov/emit/internal_resources/284/

Chadwick, K. D., Brodrick, P. G., **Grant, K.,** Goulden, T., Henderson, A., Falco, N., ... Maher, K. (2020). Integrating airborne remote sensing and field campaigns for ecology and Earth system science. *Methods in* Ecology and Evolution. https://doi.org/10.1111/2041-210X.13463

PUBLISHED DATASETS

Chadwick, K. D., **Grant, K.,** Henderson, A., Breckheimer, I., Williams, C. F., Falco, N., ... & McCormick, M. (2020). *Locations, metadata, and species cover from field sampling survey associated with NEON AOP survey, East River, CO 2018*. Environmental System Science Data Infrastructure for a Virtual Ecosystem; Watershed Function SFA.

Chadwick, K. D., **Grant, K.,** Henderson, A., Scott, A., McCormick, M., Pierce, S., ... & Maher, K. (2020). *Leaf mass per area and leaf water content measurements from field survey in association with NEON AOP survey, East River, CO 2018*. Environmental System Science Data Infrastructure for a Virtual Ecosystem; A Multiscale Approach to Modeling Carbon and Nitrogen Cycling within a High Elevation Watershed.

Chadwick, K. D., **Grant, K.,** Bill, M., Henderson, A., Scott, A., & Maher, K. (2020). *Site-level Foliar C, N, delta13C data from samples collected during field survey associated with NEON AOP survey, East River, CO 2018*. Environmental System Science Data Infrastructure for a Virtual Ecosystem; A Multiscale Approach to Modeling Carbon and Nitrogen Cycling within a High Elevation Watershed.

Chadwick, K. D., Brodrick, P. G., **Grant, K.,** Goulden, T., Henderson, A., Bill, M., ... Maher,K. (2020): NEON AOP foliar trait maps, maps of model uncertainty estimates, and conifer map, East River, CO 2018. A Multiscale Approach to Modeling Carbon and Nitrogen Cycling within a High Elevation Watershed. doi:10.15485/1618133

INVITED PRESENTATIONS

Grant, K. 2022. Quartz and Feldspar: Ready for Earth System Models. 2022 *EMIT Science Team Meeting, NASA Jet Propulsion Laboratory, Chicago, Illinois.*

Grant, K. 2022. Quartz and Feldspar Handoff to Earth System Modelers. 2022 *EMIT Science Team Meeting, NASA Jet Propulsion Laboratory, Cape Canaveral, Florida.*

Grant, K. 2022. Remotely Retrieving Quartz and Feldspar Distributions. Eat Learn Grow Series*, NASA Jet Propulsion Laboratory, Virtual.*

Grant, K. 2022. Global Quartz and Feldspar Distributions. 2022 *EMIT Science Team Meeting, NASA Jet Propulsion Laboratory, Cape Canaveral, Florida.*

Grant, K. 2022. Quenching the Quartz Quandary Part: Grain Size Edition. Eat Learn Grow Series*, NASA Jet Propulsion Laboratory, Virtual.*

Grant, K. 2022. Quenching the Quartz Quandary: Quartz and Feldspar Edition. 2022 *EMIT Science Team Meeting, NASA Jet Propulsion Laboratory, Virtual.*

Grant, K. 2022. Quenching the Quartz Quandary Part (1/X). Weekly *EMIT Science Team Meeting, NASA Jet Propulsion Laboratory, Virtual.*

Grant, K. 2021. NEON Hyperspectral Ground Campaign. ESS-DIVE *Community Data Workshop, Lawrence Berkeley National Lab, Virtual.*

SELECTED PRESENTATIONS

Grant, K., Mahowald, N.M., Miller, R.L., Perez Garcia-Pando, C., Ageitos, M.G., Li, L., Thompson, D.R., Green, R.O., Kokaly, R.F., Hubbard, B.E., West, A.J., Brodrick, P.G. 2022. Remotely Sensed Retrievals for Fractional Abundance of Quartz and Feldspar to Assess the Influence on Radiative Forcing in Earth System Models. *American Geophysical Union Fall Meeting, Chicago, IL.*

Brodrick, P., Ochoa, F., Okin, G.S., Thompson, D.R., **Grant, K.,** Ben Dor, E., Chadwick, D., Clark, R.N., Ehlmann, B.L., Fischella, M. and Ginoux, P.A., 2022, December. Global Distributions of Fractional Cover in Arid Lands: Early Analyses from NASA's Earth Surface Mineral Dust Source Investigation. *American Geophysical Union Fall Meeting, Chicago, IL.*

Clark, R.N., Swayze, G.A., Brodrick, P.G., Green, R.O., Mahowald, N.M., Thompson, D.R., Ehlmann, B.L., Ginoux, P.A., Kalashnikova, O.V., Keebler, A. and Lundeen, S., 2022, December. Minerals and Other Materials Identification and Mapping with EMIT. *American Geophysical Union Fall Meeting, Chicago, IL.*

Ochoa, F., Brodrick, P.G., Okin, G.S., Chadwick, D., Braghiere, R.K., Davis, F.W., Eckert, R., **Grant, K.,** Kreisberg, A., Angel, Y. and Lovegreen, P., 2022, December. Quantifying the uncertainty and error retrievals between field methods for deriving fractional ground cover in arid lands. *American Geophysical Union Fall Meeting, Chicago, IL.*

Green, R.O., Mahowald, N.M., Thompson, D.R., Clark, R.N., Ehlmann, B.L., Ginoux, P.A., Kalashnikova, O.V., Keebler, A., Miller, R.L., Okin, G.S. and Painter, T.H., 2022, December. First Imaging Spectroscopy Observations and Early Science from the NASA Earth Surface Mineral Dust Source Investigation. *American Geophysical Union Fall Meeting, Chicago, IL*

Thompson, D.R., Green, R.O., Mahowald, N.M., Clark, R.N., Ehlmann, B.L., Ginoux, P.A., Kalashnikova, O.V., Miller, R.L., Okin, G.S., Painter, T.H. and Pérez García-Pando, C., 2022, December. The Earth Mineral dust source InvesTigation (EMIT): Instrument Performance and Initial Results. *American Geophysical Union Fall Meeting, Chicago, IL.*

Lawrence, C.R., Williams, E.K., Chadwick, K.D., **Grant, K.,** Maher, K. 2021. Regional-Scale Soil Carbon mapping: A Case Study from the East River, Colorado, USA. *American Geophysical Union Fall Meeting, New Orleans, LA.*

Grant, K., Chadwick, K.D., Brodrick, P.G., West, A.J., Lawrence, C., Maher, K. 2021. Remote Sensing Surface Mineralogy and Foliar Metal Content to Discern Contaminant Sources Across Heterogeneous Landscapes. *American Geophysical Union Fall Meeting, New Orleans, LA.*

Grant, K., Chadwick, K.D., Brodrick, P.G., West, A.J., Falco, N., Lawrence, C., Maher, K. 2021. Mapping contaminate distributions across heterogenous landscapes through remotely sensed metal bioaccumulation. *Goldschmidt2021, Virtual.*

Powell, T., Henry, H., Bagshaw, S., Chadwick, K.D., **Denniston, K.,** Henderson, A., & Kueppers, L. M. (2019). Characterizing variability in hydraulic traits in co-occurring western subalpine conifers to improve drought response predictions. *AGUFM*, *2019*, B33F-2537. **(formerly Kathleen Denniston)**

WORK EXPERIENCE

Stanford University   Stanford, CA
Life Sciences Research Professional – School of Earth, Energy, and Environmental Science   June 2018 to July 2019

I coordinated and completed a ground sampling campaign for foliar, litter, soil and microbial analysis that accompanied hyperspectral and LiDAR datasets collected from NEON overflights. These samples were collected over twelve areas within four watersheds of interest, for a total of 435 sampling sites. Among other responsibilities, I ran a variety of assays to determine foliar, litter, root and roil compositions. The assays over which I had responsibility includes:

- Total C, N, and 13C on an Elemental Analyzer and Picarro Isotope Analyzer
- Nitric acid digests for micronutrient determination on Inductively Coupled Optical Emission Spectrometry
- Nitric acid digests for micronutrient determination on Inductively Coupled Mass Spectrometry

The May Institute   Santa Cruz, CA
Instructor – The Bay School   August 2017 to May 2018

I served as a one-on-one instructor for children on the low-functioning end of the autistic spectrum. The Bay School employs the latest applied behavioral analysis treatments and research findings to produce measurable and lasting improvements in the lives of children with autism. My role included:

- Daily collection of quantitative data relating to the development of individual students
- Created curriculum for individual students

Carnegie Institution for Science   Stanford, CA
Laboratory Technician – Department of Global Ecology   October 2016 to August 2017

I was employed at the Department of Global Ecology, Carnegie Institution for Science, located on the Stanford University campus, where I served as a laboratory technician in the Asner Lab. During my time at the Carnegie Institution, I build upon my skillset from undergraduate work and ran a wide variety of assays to determining foliar chemical compositions. In addition, at the Carnegie Institution, I obtained training on overall laboratory safety and conduct, communicated and cooperated with colleagues, and provided some general administrative support. The assays over which I had responsibility includes:

- Total C, N, and 13C on an Elemental Analyzer and Picarro Isotope Analyzer
- Nitric acid digests for micronutrient determination on Inductively Coupled Optical Emission Spectrometry • Nitric acid digests for micronutrient determination on Inductively Coupled Mass Spectrometry
- Phenol and tannin content
- Chlorophyll and carotenoid extractions
- Carbon Fractions
- Extractions of exchangeable cations
- Oxalate extractable phosphorus, iron and aluminum for determination with Inductively Coupled Optical Emission Spectrometry

ADDITIONAL INFORMATION

Applications: ArcGIS, qGIS, Python, RStudio, Julia, e-Cognition, Idrisi, PHREEQC, MATLAB, Adobe Creative Suite
Hardware: Elemental Analyzer and Picarro Isotope Analyzer, Inductively Coupled Plasma Mass Spectrometer, Inductively Coupled Plasma Optical Emission Spectrometer, MARS Microwave Digestion System, Metrohm Ion Chromatograph, HCl Evaporator, UV-Vis Spectrophotometer, 200/220 fiber analyzer, ASD FieldSpec 4 Hi-Res NG, Nicolet 860 Magna series FTIR, Thermo-Nicolet iS50 FTIR, Horiba XGT-7200 X-ray Fluorescence Microscope, Rigaku R-Axis II for X-ray diffraction
Certificates/Orgs: PhD Academy Certificate in Communication, Leadership, and Management, USC Center for Excellence in Teaching (CET), USC's Earth Sciences Diversity, Equity and Inclusion Task Force