

# Daniel J Short Gianotti, Ph.D.

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## Academic Appointments

- 2021 – . . . . .  **Research Scientist**, Massachusetts Institute of Technology.  
Parsons Laboratory, Department of Civil & Environmental Engineering.
- 2016 – 2021  **Postdoctoral Associate**, Massachusetts Institute of Technology.  
Parsons Laboratory, Department of Civil & Environmental Engineering.

## Education

- 2011 – 2016  **Ph.D., Boston University**, Geography & Environment.  
Thesis title: *The Potential Predictability of Precipitation over the Continental United States*.
- 1999 – 2003  **B.S., Harvey Mudd College**, Mathematics.  
Thesis title: *Fluid Drop Coalescence in a Hele-Shaw Cell*.  
Clinic title: *Internal Metrology for the JPL/NASA Space Interferometry Mission*.

## Grants and Funding

- in prep*  “Separating the Structural and Physiological Dynamics of Global Primary Productivity,”  
NASA Research Opportunities in Earth and Space Sciences, NNN24ZDA00N-  
CARBON, Carbon Cycle Science.  
PI: **DJ Short Gianotti**, CO-Is: BE Morgan, D Entekhabi, DL Des Marais. \$750,000.
- Funded:**  “Causes of Historical Change, Environmental Resiliency and Future of the Caspian Sea,”  
Private Donor Grant.  
PI: D Entekhabi, CO-Is: **DJ Short Gianotti**, MR Alizadeh. \$494,747.
- Funded:**  “Global Mapping of Groundwater Recharge and Sustainable Aquifer Water Withdrawals  
Using Satellite Observations,”  
MIT Climate and Sustainability Consortium.  
First Author: MR Alizadeh, PI: D Entekhabi, CO-I: **DJ Short Gianotti**. \$122,080.
- Funded:**  “Landcover Stability: Heating and Drying of Plants and Soils,”  
MIT-Portugal Program.  
First Author: **DJ Short Gianotti**, PI: D Entekhabi. \$259,002.
- Funded:**  “Analysis of Water Relations in the Soil-Plant Continuum Using Microwave-Lidar Sy-  
ergy,”  
Fundació La Caixa & Massachusetts Institute of Technology,  
PIs: D Chaparro & D Entekhabi, CO-Is: **DJ Short Gianotti**, AF Feldman, & T Jagdhuber.  
€22,000, Grant Number 1673204776.

## Publications and Talks

† denotes student advisee.

\* denotes presenting author.

## Manuscripts in Progress

- 1 M. J. Gannon<sup>†</sup>, **D. J. Short Gianotti**, and D. Entekhabi, "Meteorological-to-agricultural drought transitions in historical and future climates," *Water Resources Research*, In review at Water Resources Research.
- 2 S. Eisenacher, A. Fluhrer, J. Bliefernicht, **D. J. Short Gianotti**, H. Kunstmann, and T. Jagdhuber, "Spatio-temporal soil moisture influences on lightning density within continental United States," *Journal of Geophysical Research: Atmospheres*, Submitted to Journal of Geophysical Research: Atmospheres.
- 3 M. R. Alizadeh, **D. J. Short Gianotti**, and D. Entekhabi, "Causal regimes of soil-plant-atmospheric water tied to photosynthetic pathways in US grasslands," For submission in Nature Plants.
- 4 M. R. Alizadeh, **D. J. Short Gianotti**, J. Adamowski, and D. Entekhabi, "Observed interactions of water in soil-vegetation-atmosphere continuum across dry and wet regimes," For submission in Water Resources Research.
- 5 **D. J. Short Gianotti**, M. R. Alizadeh, and D. Entekhabi, "Review of soil moisture impacts on human heat stress and mortality," For submission in Nature Reviews Earth and Environment.

## Published Journal Articles

- 1 **D. J. Short Gianotti**, K. A. McColl, A. F. Feldman, X. Xu, and D. Entekhabi, "Two sub-annual timescales and coupling modes for terrestrial water and carbon cycles," *Global Change Biology*, vol. 30, e17463, 2024.  DOI: [10.1111/gcb.17463](https://doi.org/10.1111/gcb.17463).
- 2 **D. J. Short Gianotti** and D. Entekhabi, "Local and general patterns of terrestrial water-carbon coupling," *Geophysical Research Letters*, vol. 51, e2024GL109625, 2024.  DOI: [10.1029/2024GL109625](https://doi.org/10.1029/2024GL109625).
- 3 A. F. Feldman, **D. J. Short Gianotti**, J. Dong, I. F. Trigo, G. D. Salvucci, and D. Entekhabi, "Tropical surface temperature response to vegetation cover changes and the role of drylands," *Global Change Biology*, vol. 29, pp. 110–125, 2023.  DOI: [10.1111/gcb.16455](https://doi.org/10.1111/gcb.16455).
- 4 J. Dong, R. Akbar, A. F. Feldman, **D. J. Short Gianotti**, and D. Entekhabi, "Land surfaces at the tipping-point for water and energy balance coupling," *Water Resources Research*, vol. 59, 2023.  DOI: [10.1029/2022WR032472](https://doi.org/10.1029/2022WR032472).
- 5 L. N. Zhang<sup>†</sup>, **D. J. Short Gianotti**, and D. Entekhabi, "Land surface influence on convective available potential energy (cape) change during interstorms," *Journal of Hydrometeorology*, vol. 24, no. 8, pp. 1365–1376, 2023.  DOI: [10.1175/JHM-D-22-0191.1](https://doi.org/10.1175/JHM-D-22-0191.1).
- 6 A. F. Feldman, **D. J. Short Gianotti**, J. Dong, R. Akbar, W. T. Crow, K. A. McColl, A. Konings, J. B. Nippert, S. J. Tumber-Davila, N. M. Holbrook, F. E. Rockwell, R. L. Scott, R. H. Reichle, A. Chatterjee, J. Joiner, B. Poulter, and D. Entekhabi, "Remotely sensed soil moisture can capture dynamics relevant to plant water uptake," *Water Resources Research*, vol. 59, 2023.  DOI: [10.1029/2022WR033814](https://doi.org/10.1029/2022WR033814).
- 7 F. Jonard, A. F. Feldman, **D. J. Short Gianotti**, and D. Entekhabi, "Observed water and light limitation across global ecosystems," *Biogeosciences*, vol. 19, pp. 5575–5590, 2022.  DOI: [10.5194/bg-19-5575-2022](https://doi.org/10.5194/bg-19-5575-2022).
- 8 Y. Li, H. Lu, D. Entekhabi, **D. J. Short Gianotti**, K. Yang, C. Luo, A. F. Feldman, W. Wang, and R. Jiang, "Satellite-based assessment of meteorological and agricultural drought in mainland southeast asia," *Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, vol. 15, pp. 6180–6189, 2022.  DOI: [10.1109/JSTARS.2022.3190438](https://doi.org/10.1109/JSTARS.2022.3190438).

- 9 J. Dong, R. Akbar, **D. J. Short Gianotti**, A. F. Feldman, W. T. Crow, and D. Entekhabi, “Can surface soil moisture information identify evapotranspiration regime transitions?” *Geophysical Research Letters*, 2022.  DOI: 10.5194/bg-2020-380.
- 10 A. F. Feldman, **D. J. Short Gianotti**, I. F. Trigo, G. D. Salvucci, and D. Entekhabi, “Observed landscape responsiveness to climate forcing,” *Water Resources Research*, 2022.  DOI: 10.1029/2021WR030316.
- 11 P. Yao, H. Lu, J. Shi, T. Zhao, K. Yang, M. H. Cosh, **D. J. Short Gianotti**, and D. Entekhabi, “A long term spatially and temporally consistent global daily soil moisture dataset derived from amsr-e/2,” *Scientific Data*, 2021.  DOI: 10.1038/s41597-021-00925-8.
- 12 A. F. Feldman, **D. J. Short Gianotti**, A. G. Konings, P. Gentine, and D. Entekhabi, “Patterns of plant rehydration and growth following pulses of soil moisture availability,” *Biogeosciences*, vol. 18, pp. 831–847, 2021.  DOI: 10.5194/bg-18-831-2021.
- 13 A. F. Feldman, J. Chulakadabba<sup>†</sup>, **D. J. Short Gianotti**, and D. Entekhabi, “Landscape-scale plant water content and carbon flux behavior following moisture pulses: From dryland to mesic environments,” *Water Resources Research*, 2020.  DOI: 10.1029/2020WR027592.
- 14 R. Akbar, **D. J. Short Gianotti**, G. D. Salvucci, and D. Entekhabi, “Historical landscape drainage estimates derived from satellite-era hydrological dynamics,” *Water Resources Research*, 2020.  DOI: 10.1029/2020WR027307.
- 15 A. F. Feldman, **D. J. Short Gianotti**, I. F. Trigo, G. D. Salvucci, and D. Entekhabi, “Land-atmosphere drivers of landscape-scale plant water content loss,” *Geophysical Research Letters*, 2020.  DOI: 10.1029/2020GL090331.
- 16 F. Jonard, S. DeCannière, N. Brüggemann, P. Gentine, **D. J. Short Gianotti**, G. Lobet, D. G. Miralles, C. Montzka, B. R. Pagán, U. Rascher, and H. Vereecken, “Value of chlorophyll fluorescence for quantifying hydrological states and fluxes: Current status and challenges,” *Agricultural and Forest Meteorology*, vol. 291, 2020.  DOI: 10.1016/j.agrformet.2020.108088.
- 17 **D. J. Short Gianotti**, R. Akbar, A. F. Feldman, G. D. Salvucci, and D. Entekhabi, “Terrestrial evaporation and moisture drainage in a warmer climate,” *Geophysical Research Letters*, vol. 47, 2020.  DOI: 10.1029/2019GL086498.
- 18 A. F. Feldman, **D. J. Short Gianotti**, I. Trigo, G. D. Salvucci, and D. Entekhabi, “Satellite-based assessment of land surface energy partitioning-soil moisture relationships and effects of confounding variables,” *Water Resources Research*, vol. 55, pp. 10 657–10 677, 2019.  DOI: 10.1029/2019WR025874.
- 19 **D. J. Short Gianotti**, G. D. Salvucci, R. Akbar, K. McColl, and D. Entekhabi, “Landscape water storage and subsurface correlation from satellite surface soil moisture and precipitation observations,” *Water Resources Research*, vol. 55, pp. 9111–9132, 2019.  DOI: 10.1029/2019WR025332.
- 20 R. Akbar, **D. J. Short Gianotti**, G. D. Salvucci, and D. Entekhabi, “Mapped hydroclimatology of evapotranspiration and drainage runoff using smap brightness temperature observations and precipitation information,” *Water Resources Research*, vol. 55, pp. 3391–3413, 2019.  DOI: 10.1029/2018WR024459.
- 21 **D. J. Short Gianotti**, A. J. Rigden, G. D. Salvucci, and D. Entekhabi, “Satellite and station observations demonstrate water availability’s effect on continental-scale evaporative and photosynthetic land surface dynamics,” *Water Resources Research*, vol. 55, pp. 540–554, 2019.  DOI: 10.1029/2018WR023726.
- 22 A. F. Feldman, **D. J. Short Gianotti**, A. G. Konings, K. A. McColl, R. Akbar, G. D. Salvucci, and D. Entekhabi, “Pulse-response vegetation water uptake is persistent across biomes,” *Nature Plants*, vol. 4, no. 12, pp. 1026–1033, 2018.  DOI: 10.1038/s41477-018-0304-9.
- 23 A. J. Rigden, G. D. Salvucci, D. Entekhabi, and **D. J. Short Gianotti**, “Partitioning evapotranspiration over the continental United States using weather station data,” *Geophysical Research Letters*, vol. 45, no. 18, pp. 9605–9613, 2018.  DOI: 10.1029/2018GL079121.

- 24 R. Akbar, **D. J. Short Gianotti**, K. A. McColl, E. Haghghi, G. D. Salvucci, and D. Entekhabi, "Estimation of landscape soil water losses from satellite observations of soil moisture," *Journal of Hydrometeorology*, vol. 19, no. 5, pp. 871–889, 2018. DOI: 10.1175/JHM-D-17-0200.1.
- 25 R. Akbar, **D. J. Short Gianotti**, K. A. McColl, E. Haghghi, G. D. Salvucci, and D. Entekhabi, "Hydrological storage length-scales represented by remote sensing estimates of soil moisture and precipitation," *Water Resources Research*, vol. 54, no. 3, pp. 1476–1492, 2018. DOI: 10.1002/2017WR021508.
- 26 E. Haghghi, **D. J. Short Gianotti**, R. Akbar, G. D. Salvucci, and D. Entekhabi, "Soil and atmospheric controls on the land surface energy balance: A generalized framework for distinguishing moisture- and energy-limited evaporation regimes," *Water Resources Research*, vol. 53, no. 3, pp. 1831–1851, 2018. DOI: 10.1002/2017WR021729.
- 27 K. McColl, W. Wang, B. Peng, R. Akbar, **D. J. Short Gianotti**, M. Pan, and D. Entekhabi, "Global characterization of surface soil moisture drydowns," *Geophysical Research Letters*, vol. 44, no. 8, pp. 3682–3690, 2017. DOI: 10.1002/2017GL072819.
- 28 B. T. Anderson, J. C. Furtado, E. Di Lorenzo, and **D. J. Short Gianotti**, "Tracking the pacific decadal precession," *Journal of Geophysical Research: Atmospheres*, vol. 122, no. 6, pp. 3214–3227, 2017. DOI: 10.1002/2016JD025962.
- 29 B. T. Anderson, **D. J. Short Gianotti**, G. D. Salvucci, and J. Furtado, "Dominant timescales of potentially predictable precipitation variations across the continental United States," *Journal of Climate*, vol. 29, pp. 8881–8897, 2016. DOI: 10.1175/JCLI-D-15-0635.1.
- 30 B. T. Anderson, **D. J. Short Gianotti**, J. Furtado, and E. Di Lorenzo, "A decadal precession of atmospheric pressures over the north pacific," *Geophysical Research Letters*, vol. 43, no. 8, pp. 3921–3927, 2016. DOI: 10.1002/2016GL068206.
- 31 B. T. Anderson, **D. J. Short Gianotti**, and G. D. Salvucci, "Detectability of historical trends in station-based precipitation characteristics over the continental United States," *Journal of Geophysical Research*, vol. 120, no. 10, pp. 4842–4859, 2015. DOI: 10.1002/2014JD022960.
- 32 A. L. Gill, A. S. Gallinat, R. Sanders-DeMott, A. J. Rigden, **D. J. Short Gianotti**, J. A. Mantooth, and P. H. Templer, "Changes in autumn senescence in northern hemisphere deciduous trees: A meta-analysis of autumn phenology studies," *Annals of Botany*, vol. 116, pp. 875–888, 2015. DOI: 10.1093/aob/mcv055.
- 33 B. T. Anderson, **D. J. Short Gianotti**, and G. Salvucci, "Characterizing the potential predictability of seasonal, station-based heavy precipitation accumulations and extreme dry-spell durations," *Journal of Hydrometeorology*, vol. 16, no. 2, pp. 843–856, 2015. DOI: 10.1175/JHM-D-14-0111.1.
- 34 **D. J. Short Gianotti**, B. T. Anderson, and G. D. Salvucci, "The potential predictability of precipitation occurrence, intensity, and seasonal totals over the continental United States," *Journal of Climate*, vol. 27, no. 18, pp. 6904–6918, 2014. DOI: 10.1175/JCLI-D-13-00695.1.
- 35 I. Pal, B. T. Anderson, G. D. Salvucci, and **D. J. Short Gianotti**, "Shifting seasonality and increasing frequency of precipitation in wet and dry seasons across the US," *Geophysical Research Letters*, vol. 40, no. 15, pp. 4030–4035, 2013. DOI: 10.1002/grl.50760.
- 36 **D. J. Short Gianotti**, B. T. Anderson, and G. D. Salvucci, "What do rain gauges tell us about the limits of precipitation predictability?" *Journal of Climate*, vol. 26, no. 15, pp. 5682–5688, 2013. DOI: 10.1175/JCLI-D-12-00718.1.

## Conference Presentations

- 1 **D. J. Short Gianotti\*** and D. Entekhabi, "Time-scales of water/carbon coupling and their similarities across biomes," in *American Geophysical Union Fall Meeting*, B31A-05, San Francisco, CA, 2023.

- 2 A. F. Feldman\*, **D. J. Short Gianotti**, J. Dong, R. Akbar, W. T. Crow, K. A. McColl, A. G. Konings, J. B. Nippert, S. J. Tumber-Davila, N. M. Holbrook, F. E. Rockwell, R. H. Reichle, A. Chatterjee, J. Joiner, B. Poulter, and D. Entekhabi, "Remotely sensed soil moisture can capture dynamics relevant to plant water uptake," in *American Geophysical Union Fall Meeting*, H12E-06, San Francisco, CA, 2023.
- 3 L. N. Zhang<sup>\*†</sup>, **D. J. Short Gianotti**, and D. Entekhabi, "Land surface influence on convective available potential energy (cape) change during interstorms," in *American Geophysical Union Fall Meeting*, H11D-04, San Francisco, CA, 2023.
- 4 F. Jonard, S. De Canniere, A. F. Feldman, **D. J. Short Gianotti**, and D. Entekhabi\*, "Remote sensing based framework for observing water and light limitation across global ecosystems," in *American Geophysical Union Fall Meeting*, H13M-1632, San Francisco, CA, 2023.
- 5 Y. Xu\*, Q. He, P. Yao, H. Lu, K. Yang, A. F. Feldman, **D. J. Short Gianotti**, and D. Entekhabi, "Global characterizations of drydown events from a long-term satellite soil moisture dataset," in *IEEE International Geoscience and Remote Sensing Symposium*, Pasadena, CA, 2023. DOI: [10.1109/IGARSS52108.2023.10282498](https://doi.org/10.1109/IGARSS52108.2023.10282498).
- 6 D. Chaparro\*, T. Jagdhuber, M. Piles, M. Link, A. Fluhrer, M. J. Baur, A. F. Feldman, **D. J. Short Gianotti**, and D. Entekhabi, "Analyses of the relationship between horizontal and vertical brightness temperatures for derivation of signal-to-noise ratio and vegetation metrics," in *The Fifth Space for Hydrology Workshop*, Lisbon, Portugal, 2023.
- 7 M. Gannon<sup>\*†</sup>, **D. J. Short Gianotti**, and D. Entekhabi, "The drought cascade in a changing climate," in *American Meteorological Society Annual Meeting*, 10B.1, Denver, CO, 2023.
- 8 L. N. Zhang<sup>\*†</sup>, D. Entekhabi, and **D. J. Short Gianotti**, "Land surface influence on convective available potential energy (cape) change during drydowns," in *American Meteorological Society Annual Meeting*, JointJ2B.2, Denver, CO, 2023.
- 9 A. F. Feldman\*, **D. J. Short Gianotti**, J. Dong, I. F. Trigo, G. D. Salvucci, and D. Entekhabi, "Tropical surface temperature response to vegetation cover changes and the role of drylands," in *American Geophysical Union Fall Meeting*, B15B-05, Chicago, IL, 2022.
- 10 L. N. Zhang<sup>\*†</sup>, D. Entekhabi, and **D. J. Short Gianotti**, "Land surface influence on convective available potential energy (cape) evolution during drydowns," in *American Geophysical Union Fall Meeting*, H11F-01, Chicago, IL, 2022.
- 11 **D. J. Short Gianotti**<sup>\*</sup>, E. R. Williams, L. N. Zhang<sup>†</sup>, and D. Entekhabi, "Soil moisture impacts on convective lightning triggering," in *American Geophysical Union Fall Meeting*, H32I-07, Chicago, IL, 2022.
- 12 D. Entekhabi\*, R. Akbar, J. Dong, A. F. Feldman, and **D. J. Short Gianotti**, "Detection and mapping of shifts in dominant hydrologic processes guide model development," in *Frontiers in Hydrology Meeting*, 126-067, San Juan, Puerto Rico, 2022.
- 13 **D. J. Short Gianotti**<sup>\*</sup>, K. A. McColl, X. Xu, A. F. Feldman, and D. Entekhabi, "Ecosystem structural dynamics dominate water-use efficiency in coupling the terrestrial water and carbon cycles," in *Frontiers in Hydrology Meeting*, 241-04, San Juan, Puerto Rico, 2022.
- 14 A. F. Feldman\*, **D. J. Short Gianotti**, I. F. Trigo, G. D. Salvucci, and D. Entekhabi, "Observed landscape responsiveness to climate forcing," in *Frontiers in Hydrology Meeting*, 139-07, San Juan, Puerto Rico, 2022.
- 15 J. Dong\*, R. Akbar, **D. J. Short Gianotti**, A. F. Feldman, W. T. Crow, and D. Entekhabi, "Can surface soil moisture information identify landscape evapotranspiration regime transitions?" In *Frontiers in Hydrology Meeting*, 100-07, San Juan, Puerto Rico, 2022.
- 16 **D. J. Short Gianotti**<sup>\*</sup>, K. A. McColl, X. Xu, A. F. Feldman, and D. Entekhabi, "Emergent observed coupling of terrestrial water, energy, and carbon fluxes," in *American Geophysical Union Fall Meeting*, B15D-1460, New Orleans, LA, 2021.

- 17 A. F. Feldman\*, **D. J. Short Gianotti**, I. F. Trigo, G. D. Salvucci, and D. Entekhabi, "Observed landscape responsiveness to climate forcing," in *American Geophysical Union Fall Meeting*, H25L-1178, New Orleans, LA, 2021.
- 18 J. Dong\*, R. Akbar, A. F. Feldman, **D. J. Short Gianotti**, and D. Entekhabi, "A new framework for global soil moisture dry-down analysis and its application for vegetation water stress quantification," in *American Geophysical Union Fall Meeting*, H15W-1305, New Orleans, LA, 2021.
- 19 **D. J. Short Gianotti\*** and D. Entekhabi, "An emergent spatial water/energy/carbon relationship explained by local coupling," in *Improving Understanding of Land-Atmosphere Interactions through Integration of Surface Flux and Atmospheric Boundary Layer Measurements Workshop, Ameriflux Year of Water Fluxes Community Meeting*, Virtual, 2021.
- 20 A. F. Feldman\*, **D. J. Short Gianotti**, A. G. Konings, A. Chulakadabba<sup>†</sup>, P. Gentine, and D. Entekhabi, "Satellite-observed patterns of plant water refilling and growth response following pulses of soil moisture availability," in *Ecological Society of America Annual Meeting*, Virtual, 2020.
- 21 **D. J. Short Gianotti\***, A. F. Feldman, K. A. McColl, G. D. Salvucci, and D. Entekhabi, "Emergent climatological coupling of the terrestrial carbon sink with water and energy availability," in *American Geophysical Union Fall Meeting*, B117-03, Virtual, 2020.
- 22 A. F. Feldman\*, **D. J. Short Gianotti**, I. F. Trigo, G. D. Salvucci, and D. Entekhabi, "Land-atmosphere drivers of landscape-scale plant water content loss using satellite observations," in *American Geophysical Union Fall Meeting*, B090-02, Virtual, 2020.
- 23 A. F. Feldman\*, **D. J. Short Gianotti**, A. G. Konings, P. Gentine, K. A. McColl, R. Akbar, G. D. Salvucci, and D. Entekhabi, "Smap measurements show water movement in the soil-plant continuum as pulses," in *16th Specialist Meeting on Microwave Radiometry (MicroRAD)*, Virtual, 2020.
- 24 **D. J. Short Gianotti\***, R. Akbar, A. F. Feldman, G. D. Salvucci, and D. Entekhabi, "Land surface fluxes and hydrologic sensitivities in a warmer climate," in *American Geophysical Union Fall Meeting*, H54G-08, San Francisco, CA, 2019.
- 25 A. F. Feldman\*, **D. J. Short Gianotti**, I. F. Trigo, G. D. Salvucci, and D. Entekhabi, "Satellite-based assessment of land surface energy partitioning-soil moisture relationships and effects of confounding variables," in *American Geophysical Union Fall Meeting*, H53F-05, San Francisco, CA, 2019.
- 26 Y. Li\*, H. Lu, D. Entekhabi, and **D. J. Short Gianotti**, "The impact of higher-than-radiometer resolution landscape and weather features on smap product," in *American Geophysical Union Fall Meeting*, H51S-1771, San Francisco, CA, 2019.
- 27 **D. J. Short Gianotti**, G. D. Salvucci, R. Akbar, R. Cuenca, and D. Entekhabi\*, "Surface-subsurface linkages derived from smap time series," in *SMAP Science Team Meeting #13*, Arcadia, CA, 2019.
- 28 **D. J. Short Gianotti**, R. Akbar, A. F. Feldman, G. D. Salvucci, and D. Entekhabi\*, "Consequences of the acceleration of water cycle on surface water balance components using smap observations," in *SMAP Science Team Meeting #13*, Arcadia, CA, 2019.
- 29 D. Entekhabi\*, R. Akbar, and **D. J. Short Gianotti**, "Decadal distribution of et and drainage based on smap based hydrologic analogues and historical precipitation," in *SMAP Science Team Meeting #13*, Arcadia, CA, 2019.
- 30 R. Akbar\*, **D. J. Short Gianotti**, G. D. Salvucci, and D. Entekhabi, "Seasonal hydroclimatology of et and drainage from smap tb and precipitation," in *SMAP Science Team Meeting #13*, Arcadia, CA, 2019.
- 31 A. F. Feldman\*, **D. J. Short Gianotti**, I. Trigo, G. D. Salvucci, and D. Entekhabi, "Satellite-based assessment of surface energy partitioning soil moisture relationships," in *SMAP Science Team Meeting #13*, Arcadia, CA, 2019.

- 32 P. Yao\*, H. Lu, S. Yue, F. Yang, H. Lyu, K. Yang, K. A. McColl, **D. J. Short Gianotti**, and D. Entekhabi, "Estimating surface soil moisture from amsr2 tb with artificial neural network method and smap products," in *IEEE Geoscience and Remote Sensing Society*, Paper #2869, Yokohama, Japan, 2019.
- 33 **D. G. Short Gianotti\***, G. D. Salvucci, K. A. McColl, R. Akbar, and D. Entekhabi, "Hydrologic length scale of l-band radiometric soil moisture retrievals," in *American Geophysical Union Fall Meeting*, H42G-02, Washington, DC, 2018.
- 34 A. F. Feldman\*, **D. J. Short Gianotti**, A. G. Konings, K. A. McColl, R. Akbar, G. D. Salvucci, and D. Entekhabi, "Water exchange patterns in the soil-plant continuum based on smap microwave satellite measurements," in *American Geophysical Union Fall Meeting*, B53D-06, Washington, DC, 2018.
- 35 H. Lu\*, F. Yang, H. Lyu, K. Yang, K. A. McColl, D. J. Short Gianotti, and **D. Entekhabi**, "Estimating surface soil moisture from amsr2 tb with machine learning methods and smap products," in *American Geophysical Union Fall Meeting*, H51W-1649, Washington, DC, 2018.
- 36 G. D. Salvucci\*, A. J. Rigden, D. Entekhabi, and **D. J. Short Gianotti**, "Partitioning evapotranspiration over the continental United States using smap observations and weather station data," in *American Geophysical Union Fall Meeting*, H41F-01, Washington, DC, 2018.
- 37 **D. J. Short Gianotti\***, G. D. Salvucci, A. J. Rigden, and D. Entekhabi, "Water use efficiency dependence on soil moisture," in *Science Utilization of SMAP Meeting #2*, Arcadia, CA, 2018.
- 38 A. F. Feldman\*, **D. J. Short Gianotti**, A. G. Konings, K. A. McColl, R. Akbar, G. D. Salvucci, and D. Entekhabi, "Water exchange patterns in the soil-plant continuum based on smap microwave satellite measurements," in *Science Utilization of SMAP Meeting #2*, Arcadia, CA, 2018.
- 39 **D. J. Short Gianotti**, G. D. Salvucci, A. J. Rigden, and D. Entekhabi\*, "Linkages between water, energy and carbon cycles revealed by smap," in *SMAP End of Prime Mission Science Meeting*, Jet Propulsion Laboratory, Pasadena, CA, 2018.
- 40 R. Akbar, **D. J. Short Gianotti\***, K. McColl, E. Haghghi, G. D. Salvucci, and D. Entekhabi, "Estimation of ecosystem-scale soil water losses from satellite observations of soil moisture," in *SMAP End of Prime Mission Science Meeting*, Jet Propulsion Laboratory, Pasadena, CA, 2018.
- 41 **D. J. Short Gianotti\***, A. J. Rigden, G. D. Salvucci, and D. Entekhabi, "Effects of water availability through the coupled land-atmosphere system," in *American Geophysical Union Fall Meeting*, H12G-07, New Orleans, LA, 2017.
- 42 E. Haghghi\*, **D. J. Short Gianotti**, R. Akbar, G. D. Salvucci, and D. Entekhabi, "What determines transitions between energy- and moisture-limited evaporative regimes?" In *American Geophysical Union Fall Meeting*, H44C-07, New Orleans, LA, 2017.
- 43 G. D. Salvucci\*, A. J. Rigden, **D. J. Short Gianotti**, and D. Entekhabi, "Soil moisture (smap) and vapor pressure deficit controls on evaporation fraction over the continental u.s.," in *American Geophysical Union Fall Meeting*, H12G-01, New Orleans, LA, 2017.
- 44 **D. J. Short Gianotti\***, A. J. Rigden, G. D. Salvucci, and D. Entekhabi, "Soil moisture controls on water/energy/carbon coupling," in *Science Utilization of SMAP Meeting*, Cambridge, MA, 2017.
- 45 R. Akbar\*, **D. J. Short Gianotti**, E. Haghghi, G. D. Salvucci, and D. Entekhabi, "Estimation of ecosystem-scale soil water losses from satellite observations of soil moisture," in *Science Utilization of SMAP Meeting*, Cambridge, MA, 2017.
- 46 D. Entekhabi\*, S. S. Team, **D. J. Short Gianotti**, R. Akbar, A. J. Rigden, G. D. Salvucci, and J. S. Kimball, "The science applications of smap," in *Science Utilization of SMAP Meeting*, Cambridge, MA, 2017.
- 47 **D. J. Short Gianotti\***, A. J. Rigden, G. D. Salvucci, and D. Entekhabi, "Soil moisture controls on evaporative fraction," in *American Geophysical Union Fall Meeting*, H24C-03, San Francisco, CA, 2016.

- 48 D. J. Short Gianotti\*, G. D. Salvucci, and B. T. Anderson, "California drought, weather variability, and climate variability," in *AGU Chapman Conference on California Drought: Causes, Impacts, and Policy*, Irvine, CA, 2015.
- 49 D. J. Short Gianotti\*, B. T. Anderson, and G. D. Salvucci, "Characterizing weather and climate variability for precipitation: A data-based stochastic modeling framework," in *American Geophysical Union Fall Meeting*, San Francisco, CA, 2014.
- 50 D. J. Short Gianotti\*, B. T. Anderson, and G. D. Salvucci, "Stochastic analysis of California's recent precipitation drought in the context of the last one hundred years," in *American Geophysical Union Fall Meeting*, San Francisco, CA, 2014.
- 51 M. Dietze\*, H. E. Emery, D. Gergel, D. Gianotti, J. A. Mantooth, and A. J. Rigden, "Integrating satellite and tower phenology: A case-study in real-time ecological forecasting," in *American Geophysical Union Fall Meeting*, San Francisco, CA, 2014.
- 52 M. Dietze\*, H. E. Emery, D. Gergel, D. Gianotti, J. A. Mantooth, and A. J. Rigden, "Predicting phenology: A case-study in real-time ecological forecasting," in *Ecological Society of America Annual Meeting*, Sacramento, CA, 2014.
- 53 D. J. Gianotti\*, B. T. Anderson, and G. D. Salvucci, "Potential predictability of precipitation: Occurrence or intensity?" In *38th Climate Diagnostic and Prediction Workshop*, College Park, MD, 2013.
- 54 D. J. Gianotti\*, B. T. Anderson, and G. D. Salvucci, "Establishing potential predictability of U.S. precipitation using rain gauge data," in *37th Climate Diagnostic and Prediction Workshop*, Fort Collins, CO, 2012.
- 55 I. Pal\*, B. T. Anderson, G. Salvucci, and D. J. Gianotti, "Magnitude and significance of observed trends in precipitation frequency over the U.S.," in *37th Climate Diagnostic and Prediction Workshop*, Fort Collins, CO, 2012.
- 56 B. T. Anderson\*, D. J. Gianotti, and G. D. Salvucci, "Historical expansion of the summertime monsoon over the southwestern United States: What can regional models tell us about its causes?" In *Regional Spectral Modeling Workshop*, Scripps Institution of Oceanography, San Diego, CA, 2012.
- 57 I. Pal\*, B. T. Anderson, G. Salvucci, and D. J. Gianotti, "Magnitude and significance of observed trends in precipitation frequency over the US," in *American Geophysical Union Fall Meeting*, San Francisco, CA, 2012.
- 58 D. Gianotti\*, B. T. Anderson, and G. Salvucci, "Stochastic and deterministic aspects of observed seasonal-mean precipitation variations and extreme event occurrences over the United States," in *American Geophysical Union Fall Meeting*, San Francisco, CA, 2011.
- 59 B. T. Anderson\*, D. Gianotti, and G. D. Salvucci, "Detection of historical summertime monsoon precipitation variations and trends over the southwestern United States," in *WCRP Open Science Conference*, Denver, CO, 2011.
- 60 B. T. Anderson\*, D. Gianotti, and G. D. Salvucci, "Detection of historical precipitation variations and trends over the continental United States," in *Department of Energy Principal Investigators Meeting*, Washington, DC, 2011.
- 61 D. H. Schubert\*, D. J. Gianotti, and K. Sauers, "Upgrades to a wastewater lagoon treatment system in a rural sub-arctic community in Alaska," in *International Symposium on Cold Region Development*, Tampere, Finland, 2007.
- 62 D. H. Schubert\*, D. J. Gianotti, and G. Jones, "Application of a thermal-hydraulic model to analyze and design a circulating water system in Alaska," in *International Symposium on Cold Region Development*, Tampere, Finland, 2007.

- 63 D. J. Gianotti\*, C. Woolard, and D. White, "Wastewater treatment lagoon design in rural alaska," in *45th Alaska Water and Wastewater Management Association Annual Conference*, Juneau, AK, 2005.

## Invited Talks, Seminars, and Non-Conference Presentations

- 1 M. R. Alizedeh, K. Kummel\*†, D. J. Short Gianotti\*, and D. Entekhabi, "Global mapping of groundwater recharge and sustainable aquifer water withdrawls using satellite observations," in *MIT Energy Initiative, 2024 Future Energy Systems Center Fall Workshop*, Massachusetts Institute of Technology, Nov. 20, 2024.
- 2 D. J. Short Gianotti\*, D. Entekhabi, K. A. McColl, A. F. Feldman, and X. Xu, "Patterns and drivers of water/carbon coupling across biomes," in *Energy & Water Resources Spring Seminar Series, Department of Civil & Environmental Engineering, Cornell University*, Invited Talk, Cornell University, 2024.
- 3 D. J. Short Gianotti\*, R. Akbar, A. F. Feldman, G. D. Salvucci, and D. Entekhabi, "Climatic changes in land surface evaporation and drainage to streams," in *Ralph M. Parsons Laboratory Remote Environmental Science Seminar Series, Massachusetts Institute of Technology*, Massachusetts Institute of Technology, 2020.
- 4 A. F. Feldman\*, D. J. Short Gianotti, A. G. Konings, P. Gentine, and D. Entekhabi, "Thirsty plants: Tracking their water uptake from space," in *Ralph M. Parsons Laboratory Remote Environmental Science Seminar Series, Massachusetts Institute of Technology*, Massachusetts Institute of Technology, 2020.
- 5 D. J. Short Gianotti\*, "Water limitation and vegetation response," in *Arnold Arboretum of Harvard University Research Talks Series, Arnold Arboretum*, Invited Talk, Arnold Arboretum, 2020.
- 6 D. J. Short Gianotti\*, "Water availability controls on vegetated ecosystems," in *Ralph M. Parsons Laboratory Environmental Science Seminar Series, Massachusetts Institute of Technology*, Massachusetts Institute of Technology, 2019.
- 7 N. Toft\*†, N. Lutz\*†, D. J. Short Gianotti, and D. Entekhabi, "Impacts of soil moisture on ecosystem carbon and water exchanges," in *Civil & Environmental Engineering Mini-UROP Presentations, Massachusetts Institute of Technology*, Student Advisee, Massachusetts Institute of Technology, 2019.
- 8 D. J. Short Gianotti\*, "The potential predictability of precipitation over the continental United States," in *Dissertation Defense, Boston University*, Boston University, 2016.
- 9 D. J. Gianotti\*, "Weather models for climate variability," in *Dept. of Earth & Env. Graduate Student Presentations, Boston University*, Boston University, 2015.
- 10 D. J. Gianotti\*, "Real weather, fake weather, and the california drought," in *Dept. of Earth & Env. Graduate Student Presentations, Boston University*, Boston University, 2014.
- 11 D. J. Gianotti\*, "How predictable is rain?" In *Dept. of Geography & Env. Graduate Student Presentations, Boston University*, Boston University, 2012.
- 12 D. J. Gianotti\*, B. T. Anderson, and G. Salvucci, "Stochastic and deterministic aspects of observed seasonal-mean precipitation variations and extreme event occurrences over the United States," in *Science and Engineering Research Symposium, Boston University*, Boston University, 2012.

## Other Research Documents

- 1 D. J. Short Gianotti, G. D. Salvucci, and B. T. Anderson. "A kernel auto-regressive weather generator for improved subseasonal-to-seasonal precipitation statistics." ESS Open Archive: essoar.10503866.1. (Aug. 1, 2020),  URL: <https://doi.org/10.1002/essoar.10503866.1>.
- 2 D. H. Schubert, D. J. Gianotti, and K. Sauers, "Upgrades to a wastewater lagoon treatment system in a rural sub-arctic community in alaska," Proceedings of the 8th International Symposium on Cold Region Development, Tech. Rep., 2007.

- 3 D. H. Schubert, **D. J. Gianotti**, and G. Jones, "Application of a thermal-hydraulic model to analyze and design a circulating water system in alaska," Proceedings of the 8th International Symposium on Cold Region Development, Tech. Rep., 2007.
- 4 C. Woolard, **D. J. Gianotti**, K. Hardie, D. White, and A. Pinto, "Waste stabilization pond design and performance study," Prepared for the Alaska Department of Environmental Conservation, Tech. Rep., 2005.
- 5 **D. J. Gianotti**, "Fluid drop coalescence in a hele-shaw cell," Undergraduate Mathematics Thesis, Advised by A. Nadim, Bachelor's Thesis, Harvey Mudd College, May 2003.
- 6 K. Lampe, K. Hultman, K. Hedstrom, **D. J. Gianotti**, E. Deyo, and R. Seat, "Internal metrology for the space interferometry mission," Undergraduate Physics Clinic Report, Advised by R. Haskell, D. MacDonald, and B. Nemati, Harvey Mudd College & NASA-JPL, Tech. Rep., 2002.

## Published Software Packages

- 1 **D. J. Short Gianotti**, *Occurrence Markov chain daily precipitation model*, 2016. DOI: [10.5281/zenodo.45435](https://doi.org/10.5281/zenodo.45435).

## Published Datasets

- 1 **D. J. Short Gianotti**, *Processed data for Short Gianotti et al., "Two sub-annual time-scales and coupling modes for terrestrial water and carbon cycles"* (2024), Data set, Global Change Biology, 2024. DOI: [10.5281/zenodo.13144427](https://doi.org/10.5281/zenodo.13144427).

## Professional Appointments

- |              |  |
|--------------|--|
| 2021 – . . . | ■ <b>Research Scientist</b> , Massachusetts Institute of Technology.     |
| 2016 – 2021  | ■ <b>Postdoctoral Associate</b> , Massachusetts Institute of Technology. |
| 2011 – 2015  | ■ <b>Research Assistant</b> , Boston University.                         |
| 2010 – 2011  | ■ <b>Math Teacher</b> , Boston Public Schools.                           |
| 2004 – 2010  | ■ <b>Private Tutor</b> .   |
| 2007 – 2008  | ■ <b>Lab Technician</b> , California Institute of Technology.            |
| 2005 – 2006  | ■ <b>Environmental Engineering Associate</b> , GV Jones & Associates.    |
| 2004 – 2005  | ■ <b>Research Assistant</b> , University of Alaska, Anchorage.           |
| 2003 – 2005  | ■ <b>Substitute Teacher</b> , Anchorage School District.                 |
| 2004         | ■ <b>Staff</b> , National Youth Science Camp.                            |
| 2001 – 2003  | ■ <b>Writing Consultant</b> , Harvey Mudd College.                       |
| 2002         | ■ <b>Research Assistant</b> , Lawrence Berkeley National Lab.            |

## Teaching

### Teaching Fellow

- 2015 ■ *Introduction to Quantitative Environmental Modeling* (Boston University)

### Guest Lecturer

- 2016 – 2018 ■ *Introduction to Hydrology and Water Resources* (MIT)

- 2017 ■ *Introduction to Hydrologic Modeling* (MIT)

## Teaching (continued)

### K-12 Instruction

- 2010 – 2011      High school mathematics (Boston Public Schools)  
2004 – 2006      All subjects, K – 12 (Substitute Teacher – Anchorage School District)

### Private Tutoring

- 2002 – 2010      Math, physics, writing through advanced undergraduate  
2006 – 2010      Chemistry, biology through introductory undergraduate  
                        All subjects through advanced secondary

## Mentorship

### Thesis Committee Member

- 2022-2023      Meriah J Gannon (MIT MS in Climate, Environment, & Sustainability)  
**Thesis:** *Propagation from meteorological drought to agricultural drought under climate change*  
2021-2022      Lily N Zhang (MIT SB in Earth, Atmospheric, & Planetary Sciences)  
**Thesis:** *Evaporative Controls on Convective Adjustment: a Satellite-Based Assessment of Convective Available Potential Energy (CAPE) During Surface Drydowns*  
2018-2019      Apisada (Ju) Chulakadabba (MIT SB in Civil & Environmental Engineering)  
**Thesis:** *Water and carbon flux responses to soil moisture pulses in the Western United States*

### First-year Mini-UROP

- 2019      Naomi Lutz (MIT Civil & Environmental Engineering): *Impacts of Soil Moisture on Ecosystem Carbon and Water Exchanges*  
                 Nicole Toft (MIT Civil & Environmental Engineering): *Impacts of Soil Moisture on Ecosystem Carbon and Water Exchanges*

### Undergraduate UROP

- 2019      Nicole Toft (MIT Civil & Environmental Engineering): *Land-atmosphere interactions at the inter-storm scale*

## Professional Development

- 2015      ComSciCon 2015 Communicating Science Workshop, Harvard University.

## Professional Service

- 2022      Climate Action Through Education (CATE) Workshop K-12 Climate Curriculum Tuning Workshop, MIT Sloan School.

### Conference and Workshop Organization

- 2023      American Geophysical Union Fall Meeting – Advances in Understanding Water-Energy-Carbon Interactions (B43E, B52A)  
Primary Convener: Yanlan Liu, Conveners: Xiangtao Xu, Vincent Humphrey, & **Daniel J Short Gianotti**  
2022      American Geophysical Union Fall Meeting – Advances in Understanding Water-Energy-Carbon Interactions (B15B-I/II/III)  
Primary Convener: **Daniel J Short Gianotti**, Conveners: Xiangtao Xu, Yanlan Liu, & Vincent Humphrey

## **Professional Service (continued)**

- 2021      ■ *American Geophysical Union Fall Meeting* – Advances in Understanding Water-Energy-Carbon Interactions (Bo10-I/II)  
Primary Convener: **Daniel J Short Gianotti**, Conveners: Xiangtao Xu, Yanlan Liu, & Vincent Humphrey

## **Non-journal Reviews**

- 2020      ■ *Intergovernmental Panel on Climate Change* – Sixth Assessment Report  
Second Order Draft for Working Group I (WGI)
- 2018      ■ *Intergovernmental Panel on Climate Change* – Special Report on Climate Change, Desertification, Land Degradation, Sustainable Land Management, Food Security, and Greenhouse gas fluxes in Terrestrial Ecosystems  
First Order Draft for US Global Change Research Program

## **Journal Reviews**

- Remote Sensing of Environment
- Geophysical Research Letters
- Water Resources Research
- Bulletin of the American Meteorological Society
- Hydrology and Earth System Sciences
- Journal of Hydrometeorology
- Journal of Climate
- Biogeosciences
- Nature Communications

## **Memberships & Research Communities**

- American Geophysical Union
- Boston Water Group
- Boston Area Hydrology Journal Club
- Harvard Plants & Climate
- IEEE

## **References**

Available on Request