Katherine (Kathe) Todd-Brown, PhD

Updated 2024-1-7

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My research program creates computer simulations with mathematical models of how soil breathes and links data together to support these models. Soils play a critical feedback role in regulating atmospheric carbon dioxide concentrations, and my work develops models and data sets to better understand and predict this soil-CO2 feedback.

Education

Degree	Year	University	Department	Adviser	Thesis Title
PhD	2013	University of California, Irivne	Earth System Science	Steven D. Allison	Soil carbon dynamics: global model evaluation, predictions, and new mechanisms. (Advisor: Steven D. Allison)
BS	2004	Harvey Mudd College	Mathematics	L. de Pillis	(Research Thesis) Mathematics model of early stage tumor growth
				Michael Raugh	(Experiential Clinic) Expert decision models with Excel with Fair Isaac Corp.

Academic Appointments

1) August 2019 - Present. **Assistant Professor**. University of Florida, Gainesville, Florida.
    - Develop a federally funded research program in computational biogeochemistry (45%), teach graduate and undergraduate classes classes (45%), and academic service (10%)
2) September 2018 - July 2019. **Postdoctoral Research Fellow**. Wilfrid Laurier University, Waterloo, Ontario, Canada (remote work).
    - Mentors: Jennifer Baltzer and Merritt Turetsky (University of Guelph)
    - Conduct research on soil carbon estimation and fire driven land carbon modeling
3) June 2015 - August 2018. **Linus Pauling Distinguished Postdoctoral Research Fellow**. Pacific Northwest National Laboratory, Richland, Washington.
    - Mentors: Vanessa Bailey, Nancy Hess, and Tim Scheibe
    - Conduct research on process-rich soil carbon models
4) February 2015 - June 2015. **Postdoctoral Research Fellow**. Pacific Northwest National Laboratory, Richland, Washington.
    - Mentor: Vanessa Bailey
    - Conduct research on soil carbon models
5) January 2014 - December 2014. **Postdoctoral Research Fellow**. University of Oklahoma, Norman, Oklahoma.
    - Mentor: Yiqi Luo
    - Conduct research on soil carbon models

6) July 2008 - December 2013. **PhD Candidate**. University of California, Irvine, Irvine, California.
   - Advisor: Steven Allison
   - Conduct research on Earth system model estimation of soil organic carbon stocks
7) September 2006 - May 2008. **Research Assistant**. Massachusetts General Hospital, Boston, Massachusetts.
   - Supervisor: Shaun Purcell
   - Develop a graphical user interface for a statistical genetics tool
8) September 2005 - December 2005. **Higher Education Research Experiences (HERE) Intern**. Oak Ridge National Laboratory, Oak Ridge, Tennessee.
   - Supervisor: Stan Wullschleger and W. Mac Post (Wullschleger)
   - Implement a soil carbon model (CENTURY)

∗Please contact applicant before contacting supervisor or host of current position.

Grants

In total, I have successfully landed $2.038M since Summer 2019 at University of Florida. These grants include significant solo PI awards (NSF-DEB-ES CAREER) and multi-institutional co-PI awards (NSF-DEB-MSB and USDA-NRCS).

- Collaborative Research: MRA: Resolving and scaling litter decomposition controls from leaf to landscape in North American drylands. National Science Foundation. $591,647 (Total award $ 2,500,000). 2024 - 2029 (active)
- Hawai'i Climate Smart Commodities: A Portfolio Approach to Equitably Scaling the Agriculture Sector. United States Department of Agriculture. $637,277 (Total award $40,000,000). 2023 - 2028 (active)
- CAREER: Scaling Complexities in Soil Biogeochemistry. National Science Foundation. $565,336 (Total award $ 565,336). 2022 - 2027 (active)
- FACT CIN: Soil Spectroscopy for the Global Good. United States Department of Agriculture. $210,948 (Total award $ 1,000,000). 2020 - 2024 (active)
- Fire-Carbon Dynamics in Northern Canada. Govt of the Northwest Territory and Tides Canada. $ 32,876 (Total award $ NA). 2020 - 2021 (completed)

Publications

I have an h-index of 22 with 29 published peer-reviewed works with over 35,435 citations (Google Scholar). I have published across a number of high impact journals, including Science (impact factor: 59.9), Nature (63.6), Nature Communication (17.8), Nature Geoscience (20.5), Global Change Biology (13.1), Earth System Science Data (12.9), Geophysical Research Letters (5.6), Biogeochemistry (5.7), Biogeosciences (5.1), Ecosystems (4.9), Plant and Soil (5.4), and Journal of Mathematical Biology (2.4).

- ∗ Supervised graduate student
- + Supervised undergraduate student

1) Holmquist, J. R., Klinges, D., Lonneman, M., Wolfe, J., Boyd, B., Eagle, M., Sanderman, J., **Todd-Brown**,K., Belshe, E. F., Brown, L. N., Chapman, S., Corstanje, R., Janousek, C., Morris, J. T., Noe, G., Rovai,A., Spivak, A., Vahsen, M., Windham-Myers, L., Kroeger, K., and Megonigal, J. P.: The coastal carbonlibrary and atlas: Open source soil data and tools supporting blue carbon research and policy, Global ChangeBiology, 30, e17098, https://doi.org/https://doi.org/10.1111/gcb.17098, 2024
2) Safanelli, J. L., Sanderman, J., *Bloom*∗, D., **Todd-Brown**, K., Parente, L. L., Hengl, T., Adam, S., Albinet, F., Ben-Dor, E., Boot, C. M., Bridson, J. H., Chabrillat, S., Deiss, L., Demattê, J. A. M., Scott Demyan, M., Dercon, G., Doetterl, S., van Egmond, F., Ferguson, R., Garrett, L. G., Haddix, M. L., Haefele, S. M., Heiling, M., Hernandez-Allica, J., Huang, J., Jastrow, J. D., Karyotis, K., Machmuller, M. B., Khesuoe, M., Margenot, A., Matamala, R., Miesel, J. R., Mouazen, A. M., Nagel, P., Patel, S., Qaswar, M., Ramakhanna, S., Resch, C., Robertson, J., Roudier, P., Sabetizade, M., Shabtai, I., Sherif, F., Sinha, N., Six, J., Summerauer, L., Thomas, C. L., Toloza, A., Tomczyk-Wójtowicz, B.,

Tsakiridis, N. L., van Wesemael, B., Woodings, F., Zalidis, G. C., and Żelazny, W. R.: An interlaboratory comparison of mid-infrared spectra acquisition: Instruments and procedures matter, Geoderma, 440, 116724, https://doi.org/https://doi.org/10.1016/j.geoderma.2023.116724, 2023.

3) Vahsen, M. L., Blum, M. J., Megonigal, J. P., Emrich, S. J., Holmquist, J. R., Stiller, B., **Todd-Brown**, K. E. O., and McLachlan, J. S.: Rapid plant trait evolution can alter coastal wetland resilience to sea level rise, Science, 379, 393–398, https://doi.org/10.1126/science.abq0595, 2023.
4) Logan, J. R., **Todd-Brown**, K. E., Jacobson, K. M., Jacobson, P. J., Vogt, R., and Evans, S. E.: Accounting for non-rainfall moisture and temperature improves litter decay model performance in a fog-dominated dryland system, Biogeosciences, 19, 4129–4146, https://doi.org/10.5194/bg-19-4129-2022, 2022.
5) **Todd-Brown**, K. E. O., Abramoff, R. Z., Beem-Miller, J., Blair, H. K., Earl, S., *Frederick*$^{+}$, K. J., Fuka, D. R., Guevara Santamaria, M., Harden, J. W., Heckman, K., *Heran*$^{+}$, L. J., Holmquist, J. R., Hoyt, A. M., Klinges, D. H., LeBauer, D. S., Malhotra, A., McClelland, S. C., Nave, L. E., Rocci, K. S., Schaeffer, S. M., Stoner, S., van Gestel, N., von Fromm, S. F., and *Younger*$^{+}$, M. L.: Reviews and syntheses: The promise of big diverse soil data, moving current practices towards future potential, Biogeosciences, 19, 3505–3522, https://doi.org/10.5194/bg-19-3505-2022, 2022.
6) Luk, S. Y., **Todd-Brown**, K., Eagle, M., McNichol, A. P., Sanderman, J., Gosselin, K., and Spivak, A. C.: Soil organic carbon development and turnover in natural and disturbed salt marsh environments, Geophysical Research Letters, 48, e2020GL090287, https://doi.org/10.1029/2020GL090287, 2021.
7) Evans, S., **Todd-Brown**, K. E. O., Jacobson, K., and Jacobson, P.: Non-rainfall moisture: A key driver of microbial respiration from standing litter in arid, semiarid, and mesic grasslands, Ecosystems, 23, 1154—1169, https://doi.org/10.1007/s10021-019-00461-y, 2020.
8) Lawrence, C. R., Beem-Miller, J., Hoyt, A. M., Monroe, G., Sierra, C. A., Stoner, S., Heckman, K., Blankinship, J. C., Crow, S. E., McNicol, G., Trumbore, S., Levine, P. A., Vindušková, O., **Todd-Brown**, K., Rasmussen, C., Hicks Pries, C. E., Schädel, C., McFarlane, K., Doetterl, S., Hatté, C., He, Y., Treat, C., Harden, J. W., Torn, M. S., Estop-Aragonés, C., Asefaw Berhe, A., Keiluweit, M., Della Rosa Kuhnen, Á., Marin-Spiotta, E., Plante, A. F., Thompson, A., Shi, Z., Schimel, J. P., Vaughn, L. J. S., von Fromm, S. F., and Wagai, R.: An open-source database for the synthesis of soil radiocarbon data: International soil radiocarbon database (ISRaD) version 1.0, Earth System Science Data, 12, 61–76, https://doi.org/10.5194/essd-12-61-2020, 2020.
9) Malhotra, A., **Todd-Brown**, K., Nave, L. E., Batjes, N. H., Holmquist, J. R., Hoyt, A. M., Iversen, C. M., Jackson, R. B., Lajtha, K., Lawrence, C., Vindušková, O., Wieder, W., Williams, M., Hugelius, G., and Harden, J.: The landscape of soil carbon data: Emerging questions, synergies and databases, Progress in Physical Geography: Earth and Environment, 43, 707–719, https://doi.org/10.1177/0309133319873309, 2019.
10) Tang, J., Bradford, M. A., Carey, J., Crowther, T. W., Machmuller, M. B., Mohan, J. E., and **Todd-Brown**, K.: Chapter 8 - temperature sensitivity of soil carbon, in: Ecosystem consequences of soil warming, edited by: Mohan, J. E., Academic Press, 175–208, https://doi.org/https://doi.org/10.1016/B978-0-12-813493-1.00009-0, 2019.

10) Harden, J. W., Hugelius, G., Ahlström, A., Blankinship, J. C., Bond-Lamberty, B., Lawrence, C. R., Loisel, J., Malhotra, A., Jackson, R. B., Ogle, S., Phillips, C., Ryals, R., **Todd-Brown**, K., Vargas, R., Vergara, S. E., Cotrufo, M. F., Keiluweit, M., Heckman, K. A., Crow, S. E., Silver, W. L., DeLonge, M., and Nave, L. E.: Networking our science to characterize the state, vulnerabilities, and management opportunities of soil organic matter, Global Change Biology, 24, e705–e718, https://doi.org/10.1111/gcb.13896, 2018.
11) Lajtha, K., Bailey, V., McFarlane, K., Paustian, K., Bachelet, D., Abramoff, R., Angers, D., Billings, S. A., Cerkowniak, D., Dialynas, Y. G., Finzi, A., French, N. H. F., Frey, S., Gurwick, N. P., Harden, J., Johnson, J. M. F., Johnson, K., Lehmann, J., Liu, S. (Leo), McConkey, B., Mishra, U., Ollinger, S., Paré, D., Paz Pellat, F., Richter, D. deB., Schaeffer, S. M., Schimel, J., Shaw, C., Tang, J., **Todd-Brown**, K., Trettin, C., Waldrop, M., Whitman, T., and Wickland, K.: Chapter 12: Soils. Second state of the carbon cycle report, U.S. Global Change Research Program, https://doi.org/10.7930/soccr2.2018.ch12, 2018.
12) **Todd-Brown**, K., Zheng, B., and Crowther, T. W.: Field-warmed soil carbon changes imply high 21st-

century modeling uncertainty, Biogeosciences, 15, 3659–3671, https://doi.org/10.5194/bg-15-3659-2018, 2018.

13) Yan, Z., Bond-Lamberty, B., **Todd-Brown**, K. E., Bailey, V. L., Li, S., Liu, C., and Liu, C.: A moisture function of soil heterotrophic respiration that incorporates microscale processes, Nature Communications, 9, 2562, https://doi.org/10.1038/s41467-018-04971-6, 2018.
14) Bailey, V. L., Bond-Lamberty, B., DeAngelis, K., Grandy, A. S., Hawkes, C. V., Heckman, K., Lajtha, K., Phillips, R. P., Sulman, B. N., **Todd-Brown**, K. E. O., and Wallenstein, M. D.: Soil carbon cycling proxies: Understanding their critical role in predicting climate change feedbacks, Global Change Biology, https://doi.org/10.1111/gcb.13926, 2017.
15) Luo, Y., Shi, Z., Lu, X., Xia, J., Liang, J., Jiang, J., Wang, Y.-P., Smith, M. J., Jiang, L., Ahlström, A., Chen, B., Hararuk, O., Hastings, A., Hoffman, F., Medlyn, B., Niu, S., Rasmussen, M., **Todd-Brown**, K., and Wang, Y.-P.: Transient dynamics of terrestrial carbon storage: mathematical foundation and its applications, Biogeosciences, 14, 145–161, https://doi.org/10.5194/bg-14-145-2017, 2017.
16) Phillips, C. L., Bond-Lamberty, B., Desai, A. R., Lavoie, M., Risk, D., Tang, J., **Todd-Brown**, K., and Vargas, R.: The value of soil respiration measurements for interpreting and modeling terrestrial carbon cycling, Plant and Soil, https://doi.org/10.1007/s11104-016-3084-x, 2017.
17) Crowther, T. W., **Todd-Brown**, K. E. O., Rowe, C. W., Wieder, W. R., Carey, J. C., Machmuller, M. B., Snoek, B. L., Fang, S., Zhou, G., Allison, S. D., Blair, J. M., Bridgham, S. D., Burton, A. J., Carrillo, Y., Reich, P. B., Clark, J. S., Classen, A. T., Dijkstra, F. A., Elberling, B., Emmett, B. A., Estiarte, M., Frey, S. D., Guo, J., Harte, J., Jiang, L., Johnson, B. R., Kröel-Dulay, G., Larsen, K. S., Laudon, H., Lavallee, J. M., Luo, Y., Lupascu, M., Ma, L., Marhan, S., Michelsen, A., Mohan, J., Niu, S., Pendall, E., Peñuelas, J., Pfeifer-Meister, L., Poll, C., Reinsch, S., Reynolds, L. L., Schmidt, I. K., Sistla, S., Sokol, N. W., Templer, P. H., Treseder, K. K., Welker, J. M., and Bradford, M. A.: Quantifying global soil carbon losses in response to warming, Nature, 540, 104–108, https://doi.org/10.1038/nature20150, 2016.
18) Rasmussen, M., Hastings, A., Smith, M. J., Agusto, F. B., Chen-Charpentier, B. M., Hoffman, F. M., Jiang, J., **Todd-Brown**, K. E. O., Wang, Y., Wang, Y.-P., and Luo, Y.: Transit times and mean ages for nonautonomous and autonomous compartmental systems, Journal of Mathematical Biology, https://doi.org/10.1007/s00285-016-0990-8, 2016.
19) Wang, Y. P., Jiang, J., Chen-Charpentier, B., Agusto, F. B., Hastings, A., Hoffman, F., Rasmussen, M., Smith, M. J., **Todd-Brown**, K., Wang, Y., Xu, X., and Luo, Y. Q.: Responses of two nonlinear microbial models to warming and increased carbon input, Biogeosciences, 13, 887–902, https://doi.org/10.5194/bg-13-887-2016, 2016.
20) Yan, Z., Liu, C., **Todd-Brown**, K. E., Liu, Y., Bond-Lamberty, B., and Bailey, V. L.: Pore-scale investigation on the response of heterotrophic respiration to moisture conditions in heterogeneous soils, Biogeochemistry, 131, 121–134, https://doi.org/10.1007/s10533-016-0270-0, 2016.
21) Goll, D. S., Brovkin, V., Liski, J., Raddatz, T., Thum, T., and **Todd-Brown**, K. E. O.: Strong dependence of CO2 emissions from anthropogenic land cover change on initial land cover and soil carbon parametrization, Global Biogeochemical Cycles, 29, 1511–1523, https://doi.org/10.1002/2014GB004988, 2015.
22) Luo, Y., Ahlström, A., Allison, S. D., Batjes, N. H., Brovkin, V., Carvalhais, N., Chappell, A., Ciais, P., Davidson, E. A., Finzi, A., Georgiou, K., Guenet, B., Hararuk, O., Harden, J. W., He, Y., Hopkins, F., Jiang, L., Koven, C., Jackson, R. B., Jones, C. D., Lara, M. J., Liang, J., McGuire, A. D., Parton, W., Peng, C., Randerson, J. T., Salazar, A., Sierra, C. A., Smith, M. J., Tian, H., **Todd-Brown**, K. E. O., Torn, M., Groenigen, K. J. van, Wang, Y. P., West, T. O., Wei, Y., Wieder, W. R., Xia, J., Xu, X., Xu, X., and Zhou, T.: Towards More Realistic Projections of Soil Carbon Dynamics by Earth System Models, Global Biogeochemical Cycles, n/a–n/a, https://doi.org/10.1002/2015GB005239, 2015.
23) Wieder, W. R., Allison, S. D., Davidson, E. A., Georgiou, K., Hararuk, O., He, Y., Hopkins, F., Luo, Y., Smith, M. J., Sulman, B., **Todd-Brown**, K., Wang, Y.-P., Xia, J., and Xu, X.: Explicitly representing soil microbial processes in Earth system models, Global Biogeochemical Cycles, n/a–n/a, https://doi.org/10.1002/2015GB005188, 2015a.
24) Wieder, W. R., Cleveland, C. C., Smith, W. K., and **Todd-Brown**, K.: Future productivity and carbon storage limited by terrestrial nutrient availability, Nature Geoscience, https://doi.org/10.1038/ngeo2413, 2015b.

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25) **Todd-Brown**, K. E. O., Randerson, J. T., Hopkins, F., Arora, V., Hajima, T., Jones, C., Shevliakova, E., Tjiputra, J., Volodin, E., Wu, T., Zhang, Q., and Allison, S. D.: Changes in soil organic carbon storage predicted by Earth system models during the 21st century, Biogeosciences, 11, 2341–2356, https://doi.org/10.5194/bg-11-2341-2014, 2014.
26) **Todd-Brown**, K. E. O., Randerson, J. T., Post, W. M., Hoffman, F. M., Tarnocai, C., Schuur, E. A. G., and Allison, S. D.: Causes of variation in soil carbon simulations from CMIP5 Earth system models and comparison with observations, Biogeosciences, 10, 1717–1736, https://doi.org/10.5194/bg-10-1717-2013, 2013.
27) **Todd-Brown**, K. E. O., Hopkins, F. M., Kivlin, S. N., Talbot, J. M., and Allison, S. D.: A framework for representing microbial decomposition in coupled climate models, Biogeochemistry, 109, 19–33, https://doi.org/10.1007/s10533-011-9635-6, 2012.
28) Sklar, P., Smoller, J. W., Fan, J., Ferreira, M. A. R., Perlis, R. H., Chambert, K., Nimgaonkar, V. L., McQueen, M. B., Faraone, S. V., Kirby, A., Bakker, P. I. W. de, Ogdie, M. N., Thase, M. E., Sachs, G. S., **Todd-Brown**, K., Gabriel, S. B., Sougnez, C., Gates, C., Blumenstiel, B., Defelice, M., Ardlie, K. G., Franklin, J., Muir, W. J., McGhee, K. A., MacIntyre, D. J., McLean, A., VanBeck, M., McQuillin, A., Bass, N. J., Robinson, M., Lawrence, J., Anjorin, A., Curtis, D., Scolnick, E. M., Daly, M. J., Blackwood, D. H., Gurling, H. M., and Purcell, S.: Whole-genome association study of bipolar disorder, Mol Psychiatry, 13, 558–569, https://doi.org/10.1038/sj.mp.4002151, 2008.
29) Purcell, S., Neale, B., **Todd-Brown**, K., Thomas, L., Ferreira, M. A. R., Bender, D., Maller, J., Sklar, P., Bakker, P. I. W. de, Daly, M. J., and Sham, P. C.: PLINK: A Tool Set for Whole-Genome Association and Population-Based Linkage Analyses, The American Journal of Human Genetics, 81, 559–575, https://doi.org/10.1086/519795, 2007.

Not peer-reviewed

1) Microbes in models: Integrating microbes into earth system models for understanding climate change: Report on an american academy of microbiology virtual colloquium held on Dec. 6 and 8, 2022, https://asm.org/Reports/Microbes-in-Models-Integrating-Microbes-into-Earth. American Academy of Microbiology Virtual Colloquium; American Society for Microbiology, Washington (DC), 2023.
2) Exploring a Dynamic Soil Information System: Proceedings of a Workshop. National Academies of Sciences, Engineering, and Medicine. Washington, DC: The National Academies Press. https://doi.org/10.17226/26170. 2021.
3) **Todd-Brown**, K. and Luo, Y.: Future Research Directions for Soil Carbon Modeling, Eos, Transactions American Geophysical Union, 95, 371–371, https://doi.org/10.1002/2014EO410005, 2014.

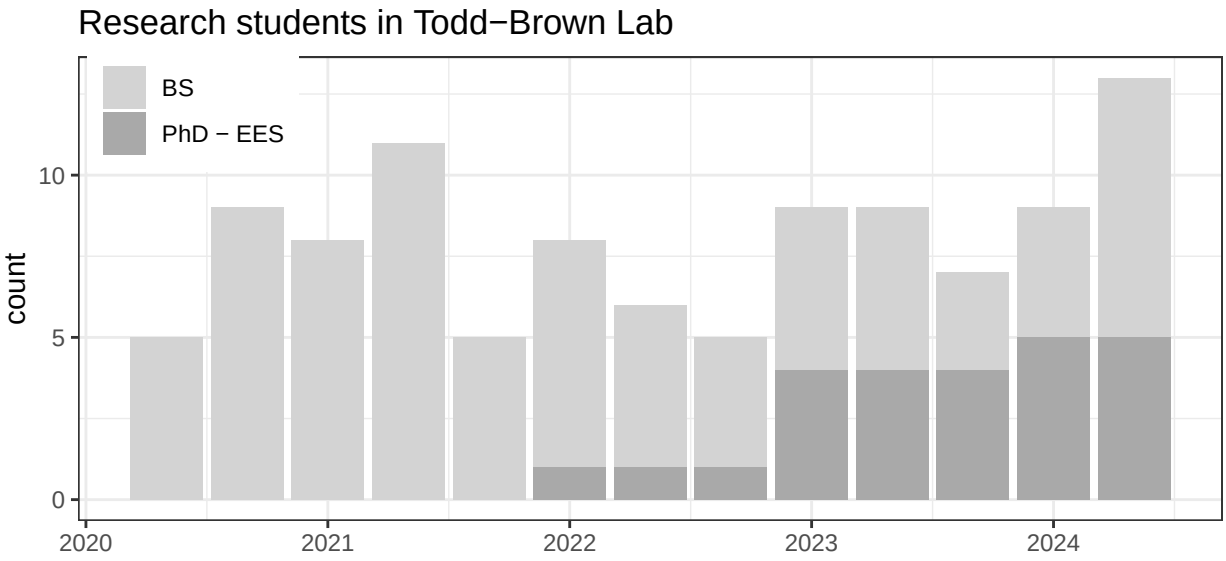
Teaching and advising

I have maintained a two course per year teaching load at University of Florida. I developed and delivered all courses.

Semester	Level	Credits	Course	Enrollment
2024 Spring	G	3	[ENV6935] Graduate Environmental Engineering Seminar: Writing Science in Environmental Engineering	8
2023 Fall	UG	3	[ENV3040C] Computational Methods for Environmental Engineers	40
2022 Fall	UG	3	[ENV3040C] Computational Methods for Environmental Engineers	48
2022 Fall	G	2	[ENV6935] Graduate Environmental Engineering Seminar: Systems Ecology Seiminar	13

Semester	Level	Credits	Course	Enrollment
2021 Fall	UG	3	[ENV3040C] Computational Methods for Environmental Engineers	53
2021 Fall	G	1	[ENV6935] Graduate Environmental Engineering Seminar: Systems Seminar	8
2020 Fall	UG	3	[ENV3040C] Computational Methods for Environmental Engineering	28
2020 Fall	G	3	[ENV6932] Special Problems: Environmental Systems Dynamics	5
2020 Spring	UG	3	[ENV3040C] Computational Methods Environmental Engineering	25

Student researchers and advising



Supervised PhD Students [Environmental Engineering Sciences]: [1] Dellena Bloom. 2021-present. [2] Ashley Bonner. 2022-present. [3] Amanda (Mandy) Liesch. 2022-present. [4] Vaasuki Marupaka. 2022-present. [5] Brandon Whitehead. 2023-present.

Undergraduate researchers: [1] Rita Hippe (Class of 2024). [2] Marisa Younger (Class of 2023). [3] Graham Louis (Class of 2025). [4] Ursa Pillay (Class of 2025). [5] Kristen Frederick (Class of 2023). [6] Lillian Heran (Class of 2023). [7] Michael Tang (Class of 2025). [8] Quentin Ashley (Class of 2021). [9] Anne Davin (Class of 2024). [10] Urmi Thorat (Class of 2024). [11] Raichel Gulde (Class of 2022). [12] Jessica Hicks (Class of 2021). [13] Emily Hetherington (Class of 2022). [14] Jane Riess (Class of 2026). [15] Julie Bielecki (Class of 2023). [16] Emily Miller (Class of 2022). [17] Ashlynn Walder (Class of 2025). [18] Anna Dias (Class of 2025). [19] Gabriel Thrasher (Class of 2027). [20] Ryan Lomaglio (Class of 2027). [21] Margaret Jones (Class of 2027). [22] Annabel Schreiber (Class of 2024). [23] Ignasio Sastre (Class of 2022). [24] Farah Aryan (Class of 2021).

Presentations

Presentations since 2018.

Conference presentations

1) **Todd-Brown, Katherine**. *Collaborations: learning how to science from the hippies (NA)*, Ignite at AGU. San Francisco, CA, USA. 12/13/2023-12/13/2023 (Oral session)
2) **Todd-Brown, Katherine**; Paul, Siddhartho; Sihi, Debjani; Vanderborght, Jan; Galdos, Marcelo; Gautam, Sagar; Zeng, Yijian; Vereecken, Harry; Wang, Zhuonan; **Liesch, A. Mandy***; van der Ploeg, Martine. *Global soil carbon potential – What if everyone is right? (B11C-01)*, American Geophysical Union Fall Meeting. San Francisco, CA, USA. 12/11/2023-12/16/2023 (Oral session)
3) **Todd-Brown, Katherine**. *Challenges of Making Soil Data Sing (149382)*, ASA, CSSA and SSSA International Annual Meeting. St. Louis, MO, USA. 11/2/2023-11/3/2023 (Invited symposium talk)
4) **Todd-Brown, Kathe**. *Community Use Cases: Soil ontology and informatics (NA)*, Earth Science Informatics Partnership January Meeting. Online. 1/18/2022-1/21/2022 (Invited oral presenter)
5) **Todd-Brown, Kathe**. *Dynamic soil information systems - Data communities, networks, and harmonization (U41C-07)*, American Geophysical Union Fall Meeting. New Orleans, LA. 12/13/2021-12/17/2021 (Invited union talk)
6) **Todd-Brown, Kathe**. *Soil-Climate Feedbacks: Illuminating Black Box Simulations with Math (MS93)*, Society for Industrial and Appied Mathematics Annual Meeting (AN21). Online. 7/19/2021-7/23/2021 (Invited oral presenter)
7) **Todd-Brown, Kathe**. *Soil Ontology and Informatics: Falling down Mt. Stupid (Opening Plenary)*, Earth Science Information Partnership Summer Meeting. Online (recording - https://youtu.be/hpxTLNjS0Gk?si=gfbkONaEZa9lsCHx&t=4244). 7/19/2021-7/23/2021 (Plenary speaker)
8) **Todd-Brown, Kathe**. *An overview of effects of fire on ecosystems (NA)*, Earth Science Information Partnership Winter Meeting. Bethesda, MD. 1/7/2020-1/9/2020 (Invited oral presenter)
9) **Todd-Brown, Katherine**; Yan, Zhifeng. *Mechanistic models to link theory and observations across scales in soil biogeochemistry (B14B-06)*, American Geophysical Union Fall meeting. San Francisco, CA. 12/9/2019-12/13/2019 (Oral presenter)

Seminar talks

1) **Todd-Brown, Katherine**. *What if everyone is right? Global soil carbon potential*, Natural Resources & Environmental Management Research Seminar, University of Hawai'i, Manou, Manou, HA, USA. 06/22/2023 (Departmental seminar)
2) **Todd-Brown, Katherine**. *Challenges of microbes in Earth system models and why viruses are useful*, Global Ecology Seminar, Carnegie Science Institute, Palo Alto, CA, USA. 02/09/2023 (Departmental seminar)
3) **Todd-Brown, Katherine**. *Mathematics of soil carbon*, Simple math seminar, University of Florida, Gainesville, FL. 4/14/2022 (Departmental seminar)
4) **Todd-Brown, Katherine**. *The mathematics of soils*, Earth Science Seminar, Tianjin University, Online. 4/13/2022 (Departmental seminar)
5) **Todd-Brown, Katherine**. *The mathematics of soils*, SIAM Seminar, University of Florida, Online. 2/1/2022 (Departmental seminar)
6) **Todd-Brown, Katherine**. *The mathematics of mudd*, Water, wetlands and watersheds Seminar, Department of Environmental Engineering Sciences. University of Florida, Online. 1/26/2022 (Departmental seminar)
7) **Todd-Brown, Katherine**. *The mathematics of soils*, Laboratory for Applied Mathematics, Numerical Software, and Statistics, Argonne National Lab, Online. 1/22/2022 (Departmental seminar)
8) **Todd-Brown, Kathe**. *Word-y soils: semantic tools for soil data harmonization*, Fall 2021 CUAHSI Cyberseminar Series, Consortium of Universities for the Advancement of Hydrologic Science, online. 11/4/2021 (Departmental seminar)
9) **Todd-Brown, Katherine**. *Successful Implementation of a Campus Wide CURE Initiative*, Florida Statewide Symposium Best Practices in Undergraduate Research, Florida Undergraduate Research Association, Gainesville, FL. 10/22/2021 (Invited Panelist)
10) **Todd-Brown, Kathe**. *Mathematics of Soil Biogeochemistry: Targeted Models for Research and Beyond*, Soil and Water Department Seminar, University of Florida, Gainesville, FL. 1/9/2020 (Invited presenter)

11) **Todd-Brown, Kathe**. *The mathematics of mud: scaling complexity in soil carbon models*, Biomathematics Seminar series, University of Florida, Gainesville, FL. 9/26/2019 (Departmental seminar)
12) **Todd-Brown, Kathe**. *Soil carbon dynamics in Earth system models: math, simulations and truth*, Department of Land Resources and Environmental Studies Seminar series, Montana State University, Bozeman, MT. 2/11/2019 (Departmental seminar)
13) **Todd-Brown, Katherine**. *Mathematics, data, and science: Understanding soil carbon dynamics in Earth system models*, NA, Argonne National Laboratory, Lemont, IL. 11/20/2018 (Departmental seminar)

Posters

1) **Todd-Brown, Katherine**; Areeveso, Precious; Atkins, Jeff; Brown, Andrew; Loisel, Julie; O'Brian, Margaret; Patel, Kaizad; Sihi, Debjani. *Tools from data-centered community of practice in soils (B45O-1814)*, American Geophysical Union Fall Meeting. New Orleans, LA. 12/13/2021-12/17/2021 (Poster presenter)
2) **Todd-Brown, Katherine**; Baltzer, Jennifer; Turetsky, Merritt. *Modeling interactions between fire behaviour and post-fire decomposition on boreal forest carbon stocks (B23I-2542)*, American Geophysical Union Fall Meeting. San Franscisco, CA. 12/9/2019-12/13/2019 (Poster presenter)

Coauthor presentations

1) Logan, Robert; **Todd-Brown, Katherine**; Jacobson, Kathryn; Jacobson, Peter; Vogt, Roland; Evans, Sarah. *Accounting for Non-Rainfall Moisture and Temperature Improves Litter Decay Model Performance in a Fog-Dominated Dryland System (B43G-2632)*, American Geophysical Union Fall Meeting. San Francisco, CA, USA. 12/11/2023-12/16/2023 (Poster co-author)
2) **Bonner, Ashley***; **Todd-Brown, Katherine**. *Single-Pool Models Are Good Proxies for Mature Soil Carbon Systems (B41E-2504)*, American Geophysical Union Fall Meeting. San Francisco, CA, USA. 12/11/2023-12/16/2023 (Poster co-author)
3) **Younger, Marisa**$^{+}$; **Bloom, Dellena***; **Hippe, Rita**$^{+}$; Baltzer, Jennifer; Turetsky, Merritt; **Todd-Brown, Katherine**. *How Do Soils Feel the Burn - Modeling Pyrogenic Recalcitrancy as a Cumulative Effect (B41E-2508)*, American Geophysical Union Fall Meeting. San Francisco, CA, USA. 12/11/2023-12/16/2023 (Poster co-author)
4) **Hippe, Rita**$^{+}$; **Bloom, Dellena***; **Younger, Marisa**$^{+}$; Baltzer, Jennifer; Turetsky, Merritt; **Todd-Brown, Katherine**. *Soil is Not Black - Constraining Pyrogenic Carbon Decomposition Parameters by Observing the Obvious (B41E-2510)*, American Geophysical Union Fall Meeting. San Francisco, CA, USA. 12/11/2023-12/16/2023 (Poster co-author)
5) Crow, Susan; Deenik, Jonathan; Enos, Kamuela; Giardina, Christian; McClellan Maaz, Tai; Miles, Albie; Nuss, Lala; Rivera-Zayas, Johanie; Sierra, Carlos; **Todd-Brown, Katherine**. *Overcoming barriers to implementation through a holistic framework for characterizing place-based suites of practices that achieve meaningful climate benefits (GC31D-01)*, American Geophysical Union Fall Meeting. San Francisco, CA, USA. 12/11/2023-12/16/2023 (Invited oral co-author)
6) Malhotra, Avni; Bailey, Vanessa; Bond-Lamberty, Ben; Georgiou, Katerina; Graham, Emily; Heckman, Katherine; Hofmockel, Kirsten; Patel, Kaizad; Rod, Kenton; Santos, Fernanda; **Todd-Brown, Katherine**; von Fromm, Sophie. *Paradigm shifts in the soil carbon data landscape (B23I-2193)*, American Geophysical Union Fall Meeting. San Francisco, CA, USA. 12/11/2023-12/16/2023 (Poster co-author)
7) Lucas Safanelli, Jose; Sanderman, Jonathan; **Bloom, Dellena***; **Todd-Brown, Katherine**; Parente, Leandro; Hengl, Tomislav. *Advances of the Soil Spectroscopy for Global Good (SS4GG) Initiative (GH23C-0927)*, American Geophysical Union Fall Meeting. San Francisco, CA, USA. 12/11/2023-12/16/2023 (Poster co-author)
8) **Marupaka, Vaasuki***; **Whitehead, Brandon***; Earl, Steven; Heckman, Katherine; Berryman, Erin; Loisel, Julie; **Pillay, Ursa**$^{+}$; **Todd-Brown, Katherine**. *Data Harmonization Pipeline for Soil Carbon Databases (B13J-2018)*, American Geophysical Union Fall Meeting. San Francisco, CA, USA. 12/11/2023-12/16/2023 (Poster co-author)
9) Harden, Jennifer; Creamer, Courtney; Lawrence, Corey; Pendall, Elise; Slate, Janet; Chadwick, Oliver;

Gillespie, Alan; Manies, Kristen; **Todd-Brown, Katherine**; Vindušková, Olga; Holland, Robert; Dains, Virginia. *Soil chronosequences inform pedogenesis: An example of data rescue, recovery, and revival from Fish Lake Valley, NV, USA (B13J-2022)*, American Geophysical Union Fall Meeting. San Francisco, CA, USA. 12/11/2023-12/16/2023 (Poster co-author)

10) Lucas Safanelli, Jose; Sanderman, Jonathan; **Bloom, Dellena***; **Todd-Brown, Katherine**; Parente, Leandro; Hengl, Tomislav. *Interoperability of Shared Middle-Infrared Soil Spectral Libraries and Instruments (414-2)*, ASA - CSSA - SSSA International Annual Meeting. St Luios, MO, USA. 10/29/2023-11/1/2023 (Invited oral co-author)
11) **Bloom, Dellena***; Lucas Safanelli, José; Sanderman, Jonathan; Hengl, Tomislav; **Todd-Brown, Katherine**. *Faster Machine Learning for MIR Soil Spectroscopy with Discrete Haar Wavelet Transform (B22I-1551)*, American Geophysical Union Fall Meeting. Chicago, IL. 12/12/2022-12/16/2022 (Poster co-author)
12) Wang, Zhuonan; Sihi, Debjani; Kumar, Jitendra; Weintraub-Leff, Samantha; **Todd-Brown, Kathe**; Mishra, Umakant. *Upscaling soil organic carbon measurements at the continental scale by multivariate clustering analysis and machine learning (B15C-06)*, American Geophysical Union Fall Meeting. Chicago, IL. 12/12/2022-12/15/2022 (Invited oral presenter)
13) Holmquist, James; Wolfe, Jaxine; Lonneman, Michael; Klinges, David; Belshe, Fay; Boyd, Brandon; Brown, Lauren; Chapman, Samantha; Corstanje, Ron; Eagle, Meagan; Janousek, Christopher; Morris, James; Noe, Gregory; Rovai, Andre; Sanderman, Jonathan; Spivak, Amanda; **Todd-Brown, Katherine**; Vahsen, Megan; Megonigal, J.; Windham-Myers, Lisamarie. *Progress in Data-Model Integration for Long Term Carbon Burial Rates in Coastal Wetlands (B34A-01)*, American Geophysical Union Fall meeting. New Orleans, LA. 12/13/2021-12/17/2021 (Invited oral co-author)
14) Slessarev, Eric; Malhotra, Avni; **Todd-Brown, Kathe**; Hugelius, Gustaf; Harden, Jennifer. *Identifying soil health baselines in the Anthropocene (B121-02)*, American Geophysical Union Fall Meeting. Online. 12/1/2020-12/17/2020 (Invited oral presenter)
15) Sanderman, Jonathan; Dangal, Shree; **Todd-Brown, Katherine**; Hengl, Tomislav; Ferguson, Richard; Ge, Yufeng; Rivard, Charlotte; van Egmond, Fenny; Savage, Kathleen; Shepherd, Keith; Wijewardane, Nuwan; Caon, Lucrezia. *Filling the soil data gap (B030-05)*, American Geophysical Union Fall Meeting. Online. 12/1/2020-12/17/2020 (Invited oral presenter)

Awards

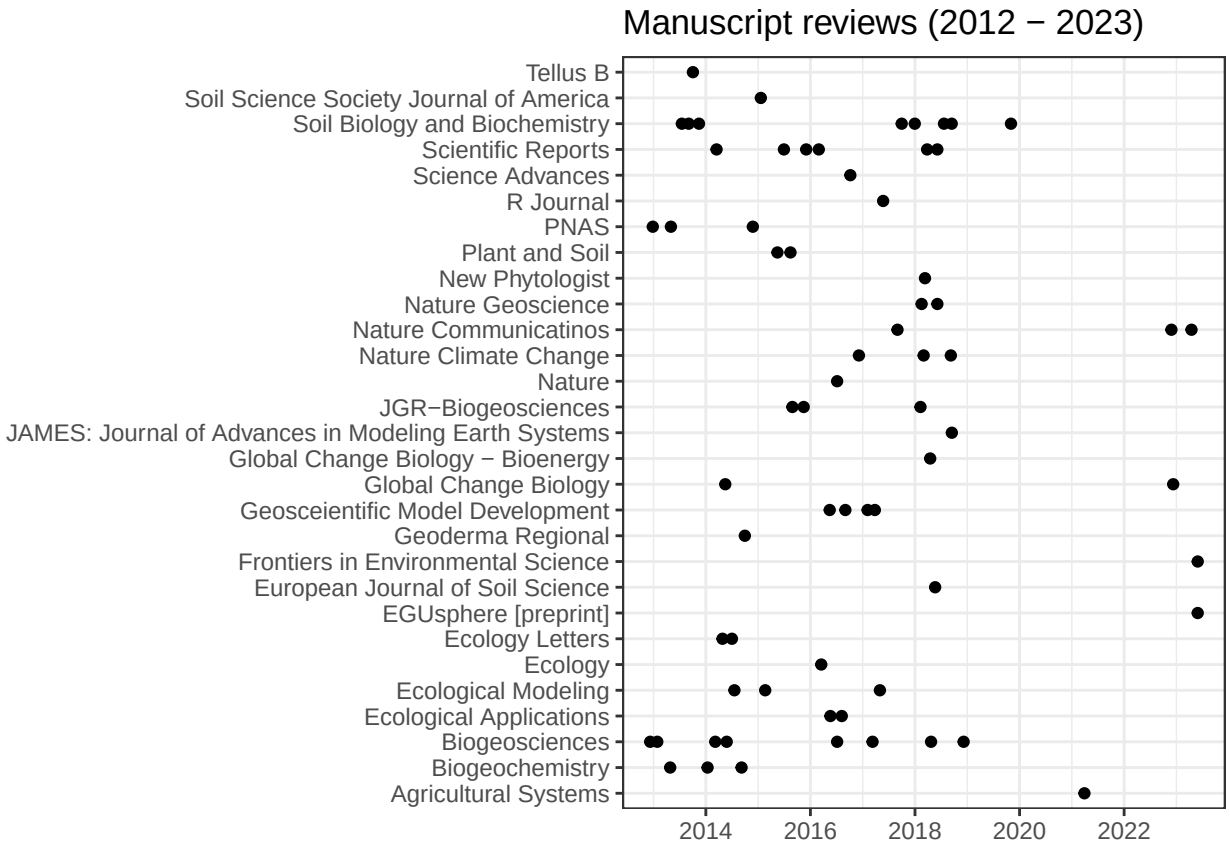
- Earth Science Information Partnership. Catalyst Award. 2023
  - This award honors participants who have brought about positive change in ESIP and inspired other members to take action.

Service

Proposal review panel member:

- US Department of Energy Office of Science.2023
- US National Science Foundation. Division of Environmental Biology. 2022
- US National Science Foundation. Geosciences. Earth Sciences. 2020
- European Research Council (ERC) Consolidator Grants. Earth Science. 2020
- ETH Zurich (Eidgenössische Technische Hochschule Zürich). Research Commission, Postdoctoral Fellowship Program. 11 April 2018
- US Department of Energy. Office of Science Graduate Student Research Program. 20 July 2017
- US National Science Foundation. Macrosystems Biology and Early NEON Science. 8-10 March 2017
- US Department of Energy, Earth System Science Funding Opportunity, 24-25 March 2015

- US Department of Energy. Terrestrial Ecosystem Science program. 20 May 2014



Service: International

- Science advisory board
  - Holistic management practices, modeling & monitoring for European forest Soils (HoliSoils), Natural Resources Institute Finland, May 2021-Dec 2025
- Executive board
  - International Soil Modeling Consortium. 2021-present
- Ongoing working group lead
  - Math of Soil Processes. International Soil Modeling Consortium. 2022-*present*.
  - Global Soil Carbon Potential. International Soil Modeling Consortium. 2021-*present*.
  - SOIL-MIP. International Soil Modeling Consortium. 2020-*present*
- Workshop lead
  - Visioning the future of soil spectroscopy. Soil Spectroscopy for the Global Good. (St Louis, MO). Oct 29-Nov 1 2023
  - How to run a volunteer collaboration. International Soil Modeling Consortium. (Virtual) Aug 2023
- Conference session organizer
  - Soil organic carbon dynamics modeling. International Soil Modeling Consortium. The Netherlands. 5-7 November 2018.
- External examiner
  - University of Exeter, Mathematics, UK, Rebecca May Varney, "Emergent constraints on soil carbon feedbacks under climate change". 2022
- Committee member
  - United Nations University, Institute for Integrated Management of Material Fluxes and of Resources (UNU-FLORES), Analytics, Informatics, and Data (AID): Soil Health. 2023 - *present*

Service: National

- Board member
  - At-Large. Earth Science Information Partnership. 2023-2025
- Working group lead
  - Soil Ontology and Informatics Cluster. Earth Science Information Partnership. 2020-*present*.
  - Operational Ethics Cluster. Earth Science Information Partnership. 2023-*present*.
- Data coordinator
  - International Soil Carbon Network (http://iscn.fluxdata.org/). 2017-*present*
- Working Group Member
  - AI working group to advance soil carbon sequestration on farms. Pecan Street, Winter 2020-Spring 2021. virtual. https://www.pecanstreet.org/2020/11/aiforsoils2/
- Organizing committee member
  - National Academy of Science Engineering and Medicine. Exploring a Dynamic Soil Information System: A Workshop. 2020 https://www.nationalacademies.org/our-work/exploring-a-dynamic-soil-information-system-a-workshop
- Society service
  - Co-chair. Soil and the critical zone technical committee, AGU-biogeochemistry section. 2020-2022
- Conference session organizer
  - "Soil Information Standards And Systems - Current Initiatives And Advances". IUSS Centennial Celebration and Congress. Florence, Italy. 19-21 May 2023.
  - Laying the bridge between soil data, knowledge, and semantics. Earth Science Information Partnership July Meeting. Pittsburgh, PA. 19-22 July 2022
  - Soils in the Anthropocene: Mechanisms of Stabilization and Change Across Scales II Oral (B33C). American Geophysical Union Fall Meeting. New Orleans, LA. 15 December 2021.
  - "Terrestrial-Soils and Biogeochemical Interactions" breakout session, Environmental System Science Principal Investigators Meeting, Washington, DC. 24-26 April 2017.
- Townhall organizer
  - ISCN Town Hall (TH43F). American Geophysical Union Fall Meeting. 2021
  - Building a Dynamic Soil Information System (TH45C). American Geophysical Union Fall Meeting. 2021

Service: Institution

- Search committee:
  - Engineering School of Sustainable Infrastructure & Environment, University of Florida. Graduate fellowship award committee. 2022
  - Engineering School of Sustainable Infrastructure & Environment, University of Florida. Faculty search committee - Digital Twin. Fall 2021 - Spring 2022
  - Environmental Molecular Sciences Laboratory, Pacific Northwest National Laboratory. Terrestrial Ecosystem Science Postdoctoral Fellowship. 2016, 2017.
  - Pacific Nortwest National Lab. Fellowship award committee. Pauling Distinguished Postdoctoral Fellowship. 2016, 2017.
- Curriculum development:
  - Herbert Wertheim College of Engineering, University of Florida. Evaluation and recommendations for undergraduate curriculum. Programming Taskforce. Summer 2021
  - Engineering School of Sustainable Infrastructure & Environment, University of Florida. New masters degree proposal. Masters of Science in Applied Data Science. Spring - Fall 2020