

**UMAKANT MISHRA**  
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**CURRENT RESEARCH INTERESTS**

- Improving spatial heterogeneity representation of soil properties/processes in global earth system models.
- Developing metrics and model benchmarks to constrain uncertainties in predicting carbon climate feedbacks.
- Predicting land use and climate change impacts on soil organic carbon pool and greenhouse gas emissions from terrestrial ecosystems.
- Predicting pedogenic decomposability of permafrost soil carbon.
- Combining biology with climate to quantify the soil climate feedbacks.

**ACADEMIC PREPARATION**

<b>Geological Postdoctoral Fellow</b> Lawrence Berkeley National Laboratory/University of California Berkeley	<b>Aug 09 – May 12</b>
<b>Doctor of Philosophy, Soil Science</b> The Ohio State University, OH, USA.	<b>Jan 06 – Jun 09</b>
<b>Master of Science, Physical Land Resources</b> Ghent University, Ghent, Belgium.	<b>Sep 02 - Sep 04</b>
<b>Bachelor of Science, Agriculture</b> Tribhuvan University, IAAS, Chitwan, Nepal.	<b>Aug 94 – Jul 98</b>

**PROFESSIONAL EXPERIENCE**

<b>Principal Member of Technical staff</b> Computational Biology & Biophysics, Sandia National Laboratory, CA, USA	<b>Oct 20 – present</b>
<b>Adjunct Professor</b> , Environmental Studies University of California, Santa Cruz, CA, USA	<b>Jan 23 - present</b>
<b>Deputy Director</b> , Lifecycle Economics and Agronomy Division Joint Bioenergy Institute, Emeryville, CA, USA	<b>Oct 22 – present</b>
<b>Scientific Lead</b> , Life-Cycle and Technoeconomic Analysis Joint Bioenergy Institute, Emeryville, CA, USA	<b>Oct 17 – Sep 22</b>
<b>Geospatial Scientist</b> Environmental Science Division, Argonne National Laboratory, IL, USA	<b>Apr 15 – Sep 20</b>

**Research Fellow**  
Computation Institute, University of Chicago, IL, USA

**Oct 14 – Sep 17**

**Assistant Geospatial Scientist**  
Environmental Science Division, Argonne National Laboratory, IL, USA

**Jun 12 – Mar15**

**Geological Postdoctoral Fellow**  
Earth Sciences Division, Lawrence Berkeley National Laboratory, USA  
Energy Biosciences Institute, University of California Berkeley, CA, USA

**Aug 09 – May 12**

**Graduate Research Associate**  
School of Environment and Natural Resources, OSU, OH, USA.

**Jan 06 – Jun 09**

**Assistant Agronomist**  
Department of Agriculture, Nepal.

**Dec 98 – Sep 02**

## NEWS & RESEARCH HIGHLIGHTS



### **NEWS RELEASE (11/14/2022)**

“The approach used in this study generates insights into how environmental factors are controlling SOC stocks and differs from the ML approach, which offers few insights into the mathematical relationships between input and output variables” – CSA news [Empirical relationships between environmental factors and soil organic carbon produce comparable prediction accuracy as the machine learning](#), Volume 86, No. 6, SSSAJ, Pages 1611-1624.  
Umakant Mishra | Kyongmin Yeo | Kabindra Adhikari | William Riley | Forrest Hoffman | Corey Hudson | Sagar Gautam



U.S. DEPARTMENT OF  
**ENERGY**

### **2017's Top Stories from the Office of Science (01/03/2018)**

[The Challenge of Estimating Alaska's Soil Carbon Stocks \(https://science.energy.gov/news/featured-articles/2018/01-03-18/\)](https://science.energy.gov/news/featured-articles/2018/01-03-18/), Vitharana et al., 2017, JGR- Biogeosciences, Volume 122, issue 2, Pages 415-429.



### **Most cited Soil & Tillage Research articles since 2010 (03/09/2015)**

[Tillage effects on soil organic carbon storage and dynamics in Corn Belt of Ohio USA](#), Volume 107, Issue 2, April 2010, Pages 88-96.

Umakant Mishra | David A N Ussiri | Rattan Lal

[Regional Study of No-Till Effects on Carbon Sequestration in the Midwestern United States](#), Volume 73, No.1, pages 207-216.

Sheila F. Christopher | Rattan Lal | Umakant Mishra



**NEWS RELEASE (05/20/2010)**

“Common view of scientists in the discipline is that a single model applicable to different soil landscapes in regional-scale was unlikely to be developed. This new method can play a vital role in improving the prediction ability of soil organic carbon pools on a regional scale” – CSA news

[Predicting the Spatial Variation of the Soil Organic Carbon Pool at a Regional Scale](#), SSSAJ, Volume 74, No. 3, Pages 906-914.

Umakant Mishra | Rattan Lal | Desheng Liu | Marc Van Meirvenne

**AWARDS, HONORS, & RECOGNITIONS**

- 2022** **IUSS Jeju Award**, International Union of Soil Science
- 2020** **Certificate of Excellence**, Regional and Global Model Analysis program, Department of Energy- Earth and Environmental Systems Sciences Division
- 2015** **Honorable mention, Editor’s citation for excellence in Manuscript review**, Agronomy Journal
- 2014** **Outstanding Associate Editor Award**, Agronomy Journal
- 2008** **Gamma Sigma Delta**, The Honor Society of Agriculture, Ohio State University
- 2008** **Edward J. Ray Travel Award**, The Ohio State University
- 2002** **Flemish Interuniversity Council (VLIR) Award**, Ghent University, Belgium

**PEER-REVIEWED PUBLICATIONS**

1. Tao, F. et al., 2023. Microbial carbon use efficiency promotes global soil carbon storage, *Nature* (Accepted for publication).
2. Lin, Z., Y. Dai, U. Mishra, G. Wang, W. Shangguan, W. Zhang, and Z. Qin. 2023. Global and regional soil organic carbon estimates: magnitude and uncertainties, *Pedosphere* (Accepted for publication).
3. Nyaupane, K., U. Mishra, F. Tao, K. Yeo, W.J. Riley, F. Hoffman, and S. Gautam. 2023. Observational benchmarks inform representation of soil organic carbon dynamics in land surface models, *Biogeosciences Discussions*, doi:10.5194/bg-2023-50.
4. Yi, Y., K. Bakian-Dogaheh, M. Moghaddam, U. Mishra, J. S. Kimball. 2023. Mapping Surface Organic Soil Properties in Arctic Tundra using C-band SAR data, *Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, doi: 10.1109/JSTARS.2023.3236117.

5. Qin, Z., K. Guan, W. Zhou, B. Peng, J. Tang, Z. Jin, R. Grant, M. Villamil, E. DeLucia, A. Margenot, U. Mishra, T. Hu, and Z. Chen. 2023. Assessing long-term impacts of cover crops on soil organic carbon in the central U.S. Midwestern agroecosystems, *Global Change Biology*, doi: 10.1111/gcb.16632.
6. Wang, M., X. Guo, S. Zhang, L. Xiao, U. Mishra, Y. Yang, B. Zhu, G. Wang, X. Mao, T. Qin, T. Jiang, Z. Shi, and Z. Luo. 2022. Depth-dependent soil carbon losses under warmer climate revealed by assessing global soil profiles, *Nature Communications*, 13, 5514, doi:10.1038/s41467-022-33278-w.
7. Baral, N.R., S.K. Mishra, S. Gautam, U. Mishra and C.D. Scown. 2022. Multifunctional landscape for Dedicated Bioenergy Crops Leads to Low-Cost and Carbon-Negative Biofuels, *Renewable and Sustainable Energy Reviews*, 169, 112857, doi: 10.1016/j.rser.2022.112857.
8. Lin, Z., Y. Dai, U. Mishra, G. Wang, W. Shangguan, W. Zhang, and Z. Qin. 2022. On the magnitude and uncertainties of global and regional soil organic carbon: A comparative analysis using multiple estimates, *Earth System Science Data Discussions*, doi:10.5194/essd-2022-232.
9. Mishra, U., K. Yeo, A. Adhikari, W.J. Riley, F. Hoffman, C. Hudson, and S. Gautam. 2022. Empirical relationships between environmental factors and soil organic carbon produce comparable prediction accuracy as the machine learning, *Soil Science Society of America Journal*, doi:10.1002/saj2.20453.
10. Gautam, S., U. Mishra, C.D. Scown, S.A. Wills, K. Adhikari and B. Drewniak. 2022. Climate change may release over 1.8 petagrams of soil organic carbon from topsoils in the United States by 2100, *Global Ecology & Biogeography*, 31, 1146-1160, doi: 10.1111/geb.13489.
11. Zhang, Z., Y. Wang, Y. Zhu, K. He, T. Li, U. Mishra, F. Wang, L. Yu, X. Zhao, L. Zhu, X. Zhu, and Z. Qin. 2022. Carbon sequestration in soil and biomass under native and non-native mangrove ecosystems, *Plant & Soil*, doi:10.1007/s11104-022-05352-1.
12. Kim, Y.J., D. Laffly, S-E. Kim, L. Nilsen, J. Chia, S. Nama, Y.B. Leed, S. Jung, U. Mishra, Y.K. Lee, J.Y. Jung. 2022. Chronological changes in soil biogeochemical properties of the glacier foreland in Midtre Lovénbreen, Svalbard, attributed to soil-forming factors, *Geoderma*, 415, 115777, doi: 10.1016/j.geoderma.2022.115777.
13. Heckman, K.A., C.W. Swanston, M.S. Torn, P.J. Hanson, L.E. Nave, R.C. Porras, U. Mishra, and M. Bill. 2021. Soil organic matter is principally root derived in an Ultisol under oak forest, *Geoderma*, 403, 115385, doi: 10.1016/j.geoderma.2021.115385.
14. Joshi, D., R. Ghimire, T. Kharel, U. Mishra, S. Clay and D. Clay. 2021. Prospects of conservation agriculture for food security and climate resilience in Nepal, *Agronomy Journal*, doi: 10.1002/agj2.20830.
15. Baatz, R., H.-F. Harrie-Jan, E. Euskirchen, S. Debjani, M. Dietze, K. Van Looy, G. de Lannoy, M. Williams, V. Pauwels, C. Montzka, U. Mishra, H. Bogena, M. Adamescu, A. Fox, K. Görgen, B. Naz, and H. Vereecken. 2021. Reanalysis in Earth system science:

towards terrestrial ecosystem reanalysis, *Reviews of Geophysics*, doi: 10.1029/2020RG000715.

16. Mishra, U., G. Hugelius, E. Shelef, Y. Yang, J. Strauss, A. Lupachev, J. W. Harden, J. D. Jastrow, C.-L. Ping, W. J. Riley, E. A. G. Schuur, R. Matamala, M. Siewert, L. E. Nave, C. D. Koven, M. Fuchs, J. Palmtag, P. Kuhry, C. C. Treat, S. Zubrzycki, F. M. Hoffman, B. Elberling, P. Camill, A. Veremeeva, and A. Orr. 2021. Spatial heterogeneity and environmental predictors of permafrost region soil organic carbon stocks. *Science Advances*, 7, eaaz5236, doi: 10.1126/sciadv.aaz5236.
17. Goncalves, D.R.P., U. Mishra, S.A. Wills, and S. Gautam. 2021. Regional Environmental controllers influence continental scale soil carbon stocks and future carbon dynamics, *Scientific Reports*, 11, 6474, doi: 10.1038/s41598-021-85992-y.
18. Mishra, S.K., S. Gautam, U. Mishra, and C. D. Scown. 2021. Performance-based payments for soil carbon sequestration can allow a low-carbon bioeconomy, *Environmental Science & Technology*, 55 (8), 5180-5188, doi:10.1021/acs.est.0c06452.
19. Shu, S., A. K. Jain, C. D. Koven, and U. Mishra. 2020. Estimation of permafrost SOC stock and turnover time using a land surface model with vertical heterogeneity of permafrost soils, *Global Biogeochemical Cycles*, 34, e2020GB006585, doi: 10.1029/2020GB006585.
20. Mishra, U., S. Gautam, W.J. Riley, and F. Hoffman. 2020. Ensemble machine learning approach better predicts the spatial heterogeneity of surface soil organic carbon stocks in data-limited northern circumpolar region, *Frontiers in Big data*, 3, 40, doi: 10.3389/fdata.2020.528441.
21. Sulman, B., J. Harden, Y. He, C. Treat, C. Koven, U. Mishra, J. O'Donnell, L. Nave. 2020. Land use and land cover affect the depth distribution of soil carbon: Insights from a large database of soil profiles, *Frontiers in Environmental Science* 8, 146, doi: 10.3389/fenvs.2020.00146.
22. Gautam, S., U. Mishra, Y. Yang, and C. Scown. 2020. Sorghum biomass production in the continental United States and its potential impacts on soil organic carbon and nitrous oxide emissions, *Global Change Biology Bioenergy*, 12, 878-890, doi:10.1111/gcbb.12736.
23. Adhikari, K., U. Mishra, P.R. Owens, Z. Libohova, S.A. Wills, W.J. Riley, F. M. Hoffman and D.R. Smith. 2020. Importance and strength of environmental controllers of soil organic carbon changes with scale, *Geoderma*, 375, 114472, doi:10.1016/j.geoderma.2020.114472.
24. Novak, J.M., P.J. Bauer, D.L. Karlen, P.G. Hunt and U. Mishra. 2020. Loamy sand soil approaches organic carbon saturation after 37 years of conservation tillage, *Agronomy Journal*, 112, 3152-3162, doi:10.1002/agj2.20184.
25. Sainju, U., R. Ghimire, U. Mishra and S. Jagadamma. 2020. Reducing nitrous oxide emissions and optimizing nitrogen use efficiency in dryland crop rotations with different

nitrogen rates, *Nutrient Cycling in Agroecosystems*, 116, 381–395, doi: 10.1007/s10705-020-10046-0.

26. Huntington, T., X. Cui, U. Mishra, and C. Scown. 2020. Machine learning for bioenergy sorghum yield prediction under future climate scenarios, *Biofuels, Bioproducts & Biorefining*, 14, 566-577, doi:10.1002/bbb.2087.
27. Thies, S., D.R. Joshi, S. Bruggeman, S.A. Clay, U. Mishra, J. Morile-Miller, and D.E. Clay. 2020. Fertilizer timing affects nitrous oxide, carbon dioxide, and ammonia emissions from soil, *Soil Science Society of America Journal*, 84, 115-130, doi: 10.1002/saj2.20010.
28. Thies, S., S. Bruggeman, S.A. Clay, U. Mishra, G. Hatfield, S. Kumar and D.E. Clay, 2019. Midmorning point sampling may not accurately represent nitrous oxide emissions following fertilizer applications, *Soil Science Society of America Journal*, 83, 339-347, doi: 10.2136/sssaj2018.08.0313.
29. Goncalves, D.R.P., J.C.D.M. Sa, U. Mishra, A.J. Fornari, F.J.F. Furlan, L.A. Ferreira, and T.M. Inagaki. 2019. Conservation agriculture based on diversified and high-performance production system leads to soil carbon sequestration in subtropical environments, *Journal of Cleaner Production*, 219, 136-147, doi: 10.1016/j.jclepro.2019.01.263.
30. Vitharana, U.W.A., U. Mishra, and R. B. Mapa. 2019. National soil organic carbon estimates can improve global estimates, *Geoderma*, 337, 55-64, doi: 10.1016/j.geoderma.2018.09.005.
31. Nave L.E., B.F Walters, K.L. Hofmeister, C.H. Perry, U. Mishra, G.M. Domke, and C.W. Swanston. 2019. The role of reforestation in carbon sequestration, *New Forests*, 50(1), 115-137, doi: 10.1007/s11056-018-9655-3.
32. Mitran T., U. Mishra, R. Lal, T. Ravisankar, and K. Sreenivas. 2018. Spatial distribution of soil carbon stocks in a semi-arid region of India, *Geoderma Regional*, 15, p. e00192, doi: 10.1016/j.geodrs.2018.e00192.
33. Goncalves, D.R.P., J.C. Sa, U. Mishra, F.J.F. Furlan, L.A. Ferreira, T.M. Inagaki, J. Romaniw, A. De Oliveira Ferreira, C. Briedis. 2018. Soil carbon inventory to quantify the impact of land use change to mitigate greenhouse gas emission and ecosystem services, *Environmental Pollution*, 243, 940-952, doi: 10.1016/j.envpol.2018.07.068.
34. Nave L.E., G.M. Domke, K.L. Hofmeister, U. Mishra, C.H. Perry, B.F Walters, and C.W. Swanston. 2018. Reforestation can sequester two petagrams of carbon in U.S. topsoils in a century, *Proceedings of the National Academy of Sciences*, 115, 2776-2781, doi: 10.1073/pnas.1719685115.

35. Yi Y., J. S. Kimball, R. H. Chen, M. Moghaddam, R. H. Reichle, U. Mishra, D. Zona, and W.C. Oechel. 2018. Characterizing permafrost active layer dynamics and sensitivity to landscape spatial heterogeneity in Alaska, *The Cryosphere*, 12, 145-161, doi: 10.5194/tc-12-145-2018.
36. Sa J.C.d.M., D.R.P. Goncalves, L.A. Ferreira, U. Mishra, T.M. Inagaki, F.J.F. Furlan, R.S. Moro, N. Floriani, C. Briedis, A. De Oliveira Ferreira. 2018. Soil carbon fractions and biological activity based indices can be used to study the impact of land management and ecological successions, *Ecological Indicators*, 84: 96–105, doi: 10.1016/j.ecolind.2017.08.029.
37. Van Looy K., J. Bouma, M. Herbst, J. Koestel, B. Minasny, U. Mishra, C. Montzka, A. Nemes, Y. Pachepsky, J. Padarian, M. Schaap, B. Tóth, A. Verhoef, J. Vanderborght, M. van der Ploeg, L. Weihermüller, S. Zacharias, Y. Zhang, H. Vereecken. 2017. Pedotransfer functions in Earth system science: challenges and perspectives, *Reviews of Geophysics*, 55, doi: 10.1002/2017RG000581.
38. Shelef E., J.C. Rowland, C.J. Willson, G.E. Hilley, U. Mishra, G.L. Altman and C-L. Ping. 2017. Large uncertainty in permafrost carbon stocks due to hillslope soil deposits, *Geophysical Research Letters*, 44, 6134–6144, doi: 10.1002/2017GL073823.
39. Matamala R., J.D. Jastrow, S. Hofmann, U. Mishra, G. Michaelson, F. Calderon, C-L. Ping, and Z. Fan. 2017. Influence of site and soil properties on the DRIFT spectra of northern cold-region soils, *Geoderma*, 305, 80-91, doi: 10.1016/j.geoderma.2017.05.014.
40. Vitharana U.W.A., U. Mishra, J.D. Jastrow, R. Matamala, and Z. Fan. 2017. Observational needs for estimating Alaskan soil carbon stocks under current and future climate, *Journal of Geophysical Research-Biogeosciences*, 122, 2, 415-429, doi: 10.1002/2016JG003421.
41. Rosemary F., U.W.A.Vitharana, S.P. Indraratne, R.Weerasooriya, and U. Mishra. 2017. Exploring the spatial variability of soil properties in an Alfisol Catena, *Catena*, 150:53-61, doi:10.1016/j.catena.2016.10.017.
42. Gonçalves D.R.P., J.C. de Moraes Sá, U. Mishra, C.E.P. Cerri, L.A. Ferreira, and F.J.F. Furlan. 2017. Soil type and texture impacts on soil organic carbon accumulation in a subtropical agro-ecosystem, *Geoderma*, 286:88-97, doi:10.1016/j.geoderma.2016.10.021.
43. Mishra U., B. Drewniak, J.D. Jastrow, R.M. Matamala, and U.W.A. Vitharana. 2017. Spatial representation of high latitude organic carbon and active-layer thickness in CMIP5 earth system models, *Geoderma*, 300:55-63, doi:10.1016/j.geoderma.2016.04.017.
44. Jiang Y., A.V. Rocha, E.B. Rastetter, G.R. Shaver, U. Mishra, Q. Zhuang, and B.L. Kwiatkowski. 2016. C-N-P interactions control climate driven changes in regional

patterns of C storage on the North Slope of Alaska, *Landscape Ecology*, 31:195-213, doi:10.1007/s10980-015-0266-5.

45. Reitsma K.D., B.H. Dunn, U. Mishra, S.A. Clay, T. DeSutter, and D.E. Clay. 2015. Land-use change impact on soil sustainability in a climate and vegetation transition zone, *Agronomy Journal*, 107:2363–2372, doi:10.2134/agronj15.0152.
46. Mishra U., and W.J. Riley. 2015. Scaling impacts on environmental controls and spatial heterogeneity of soil organic carbon stocks, *Biogeosciences*, 12:3993-4004, doi:10.5194/bg-12-3993-2015.
47. Drewniak B., U. Mishra, J. Song, J. Prell, and V.R. Kotamarthi. 2015. Modeling the impact of agriculture land use and management on U.S. carbon budget, *Biogeosciences*, 12:2119–2129, doi:10.5194/bg-12-2119-2015.
48. Hugelius G.H., J. Strauss, S. Zubrzycki, P. Kuhry, J.W. Harden, E.A.G. Schuur, C-L. Ping, L. Schirrmeister, G. Michaelson, C.D. Koven, J. O'Donnel, B. Elberling, U. Mishra, P. Camill, Z. Yu, and J. Palmtag. 2014. Estimated stocks of circumpolar permafrost carbon with quantified uncertainty ranges and identified data gaps, *Biogeosciences*, 11:6573–6593.
49. Mishra U., and W.J. Riley. 2014. Active-layer thickness across Alaska: comparing observation-based estimates with CMIP5 earth system model predictions, *Soil Science Society of America Journal*, 78:894-902.
50. Mishra U., J.D. Jastrow, R. Matamala, G. Hugelius, C.D. Koven, J.W. Harden, C.L. Ping, G.J. Michaelson, Z. Fan, R.M. Miller, A.D. McGuire, C. Tarnocai, P. Kuhry, W.J. Riley, K. Schaefer, E.A.G. Schuur, M.T. Jorgenson, and L.D. Hinzman. 2013. Empirical estimates to reduce modeling uncertainties of soil organic carbon in permafrost regions: a review of recent progress and remaining challenges, *Environmental Research Letters*, 8:035020, doi:10.1088/1748-9326/8/3/035020.
51. Hugelius G.H., C. Tarnocai, J.G. Bockheim, P. Camill, B. Elberling, G. Grosse, J.W. Harden, K. Johnson, T. Jorgenson, C.D. Koven, P. Kuhry, G. Michaelson, U. Mishra, J. Palmtag, C-L. Ping, J. O'Donnel, L. Schirrmeister, E.A.G. Schuur, Y. Sheng, L.C. Smith, J. Strauss, and Z. Yu. 2013. A new dataset for estimating organic carbon storage to 3 m depth in soils of the northern circumpolar permafrost region, *Earth System Science Data*, 5:3–13, doi:10.5194/essd-5-3-2013.
52. Nave, L.E., C.W. Swanston, U. Mishra, and K.J. Nadelhoffer. 2013. Afforestation effects on soil carbon storage: An assessment for the United States based on meta-analysis, stable isotopes, and a geospatial soil carbon database, *Soil Science Society of America Journal*, 77:1035-1047, doi:10.2136/sssaj2012.0236.



53. Mishra U. 2013. Soil health and climate change: a book review, *Soil Science Society of America Journal*, 77:336-336.
54. Mishra U., M.S. Torn, and K. Fingerman. 2013. Miscanthus biomass productivity within U.S. croplands and its potential impact on soil organic carbon, *Global Change Biology Bioenergy*, 5:391-399, doi: 10.1111/j.1757-1707.2012.01201.x.
55. Mishra U., and W.J. Riley. 2012. Alaskan soil carbon stocks: spatial variability and dependence on environmental factors, *Biogeosciences*, 9:3637-3645, doi:10.5194/bg-9-3637-2012.
56. Mishra U., M.S. Torn, S. Ogle, and E. Masanet. 2012. Improving regional soil carbon inventories: combining IPCC carbon inventory method with regression kriging, *Geoderma*, 189-190:288-295, doi:10.1016/j.geoderma.2012.06.022.
57. Scown C.D., W. Nazaroff, U. Mishra, B. Strogon, A. Lobscheid, T. McKone, and A. Horvath. 2012. Lifecycle greenhouse gas implications of US National Scenarios for cellulosic ethanol production, *Environmental Research Letters*, 7:014011, doi:10.1088/1748-9326/7/1/014011.
58. McKone T., W. Nazaroff, M. Auffhammer, P. Berck, T. Lipman, M. Torn, E. Masanet, A. Lobscheid, N. Santero, U. Mishra, A. Barrett, M. Bomberg, K. Fingerman, C. Scown, B. Strogon, and A. Horvath. 2011. Grand Challenges for life-cycle assessment of biofuels, *Environmental Science & Technology*, 45:1751-1756, doi: 0.1021/es103579c.
59. Mishra U., D. Ussiri, and R. Lal. 2010. Tillage effects on soil carbon storage and dynamics in corn belt of Ohio USA, *Soil & Tillage Research*, 107:88-96, doi:10.1016/j.still.2010.02.005.
60. Mishra U., R. Lal, D. Liu, and M. Van Meirvenne. 2010. Predicting the spatial variation of soil organic carbon pool at a regional scale, *Soil Science Society of America Journal*, 74: 906-914.
61. Lamsal S., and U. Mishra. 2010. Mapping soil textural fractions across a large watershed in north-east Florida, *Journal of Environmental Management*, 91:1686-1694.
62. Mishra U., R. Lal, B. Slater, F. Calhoun, D. Liu, and M. Van Meirvenne. 2009. Predicting soil organic carbon stock using profile depth distribution functions and ordinary kriging, *Soil Science Society of America Journal*, 73:614-621.

63. Christopher S.F., R. Lal, and U. Mishra. 2009. Long-term no-till effects on carbon sequestration in the Midwestern U.S, *Soil Science Society of America Journal*, 73:207-216, doi: 10.2136/sssaj2007.0336.
64. Mishra U., D. Clay, T. Trooien, K. Dalsted, D. Malo, and C.G. Carlson. 2008. Assessing the value of using a remote sensing-based evapotranspiration map in site- specific management, *Journal of Plant Nutrition*, 31:1188-1202, doi: 10.1080/01904160802134491.

### **PEER-REVIEWED BOOK CHAPTERS & WORKSHOP REPORTS**

1. Hoffman, F.M., J. Kumar, Z. Shi, A. P. Walker, J. Mao, Y. Wang, A. L. S. Swann, J. T. Randerson, U. Mishra, G. J. Kooperman, H. Kim, C. Xu, C. D. Koven, D. Lawrence, M. Fowler, M. De Kauwe, B. Medlyn, L. Gu, L. Agee, J. Warren, S. Serbin, A. Rogers, T. F. Keenan, N. McDowell, N. Collier, S. Sreepathi, J. Restrepo, R. Archibald, F. Bao, R. T. Mills. 2021. AI-Constrained Bottom-Up Ecohydrology and Improved Prediction of Seasonal, Interannual, and Decadal Flood and Drought Risks, DOE BER, AI4ESP 2021 #AI4ESP1060, DOI: <https://doi.org/10.2172/1769668>.
2. Kim, Y. J., J. Y. Jung, and U. Mishra. 2021. Managing Soil Organic Carbon for Climate Change Mitigation and Food Security, In Rattan Lal (Ed) *Soil Organic Carbon and Feeding the Future: Basic Soil Processes, Advances in Soil Science*, Taylor and Francis, Boca Raton, FL, doi: 10.1201/9781003243090-2.
3. Joshi, D.R., D.E. Clay, S. Clay, A. Smart, S.A. Clay, T.P. Kharel and U. Mishra. 2019. Soil and land-use change sustainability in the Northern Great Plains of the USA. In S. Appiah-Opoku (ed.) *Land Use*, IntechOpen Limited, London, United Kingdom; doi: 10.5772/intechopen.84781.
4. Lajtha, K., V.L. Bailey, K. McFarlane, K. Paustian, D. Bachelet, R. Abramoff, D. Angers, S.A. Billings, D. Cerkowniak, Y.G. Dialynas, A. Finzi, N.H.F. French, S. Frey, N.P. Gurwick, J. Harden, J.M.F. Johnson, K. Johnson, J. Lehmann, S. Liu, B. McConkey, U. Mishra, S. Ollinger, D. Paré, F. Paz Pellat, D. deB. Richter, S.M. Schaeffer, J. Schimel, C. Shaw, J. Tang, K. Todd-Brown, C. Trettin, M. Waldrop, T. Whitman, and K. Wickland, 2018: Chapter 12: Soils. In *Second State of the Carbon Cycle Report (SOCCR2): A Sustained Assessment Report* [Cavallaro, N., G. Shrestha, R. Birdsey, M. A. Mayes, R. G. Najjar, S. C. Reed, P. Romero-Lankao, and Z. Zhu (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 469-506, <https://doi.org/10.7930/SOCCR2.2018.Ch12>.
5. Mitran, T., U. Mishra, and R. Lal. 2018. Climate change impacts on soil carbon stocks in India. In Lal. R., B.A. Stewart (eds.) *Advances in Soil Science: Soil and Climate*, CRC press, Taylor and Francis Group, FL, USA.
6. Clay, D.E., and U. Mishra. 2017. The importance of crop residues in maintaining soil organic carbon in agroecosystems. In Zhangcai Q., Mishra U., and Hastings A. (eds.) *Bioenergy and Land Use Change*, Geophysical Monograph 231, John Wiley & Sons, Inc. p. 115- 123.

7. Hoffman, F. M., C.D. Koven, G. Keppel-Aleks, D.M. Lawrence, W.J. Riley, J.T. Randerson, A. Ahlström, G. Abramowitz, D.D. Baldocchi, M.J. Best, B. Bond-Lamberty, M.G. De Kauwe, A.S. Denning, A.R. Desai, V. Eyring, J.B. Fisher, R.A. Fisher, P.J. Gleckler, M. Huang, G. Hugelius, A.K. Jain, N.Y. Kiang, H. Kim, R.D. Koster, S.V. Kumar, H. Li, Y. Luo, J. Mao, N.G. McDowell, U. Mishra, P.R. Moorcroft, G.S.H. Pau, D.M. Ricciuto, K. Schaefer, C.R. Schwalm, S.P. Serbin, E. Shevliakova, A.G. Slater, J. Tang, M. Williams, J. Xia, C. Xu, R. Joseph, and D. Koch. 2017. International Land Model Benchmarking (ILAMB) Workshop Report, Technical Report DOE/SC-0186, U.S. Department of Energy, Office of Science, Germantown, Maryland, USA, doi:10.2172/1330803.
8. Larson, S.L., R. Busby, W.A. Martin, V.F. Median, P. Seman, C.A. Hiemstra, U. Mishra, and T. Larson. 2017. Sustainable carbon dioxide sequestration as soil carbon to achieve carbon neutral status for DoD lands, Engineer Research and Development Center, ERDC TR-17-13, US Army Corps of Engineers, Washington DC, USA.
9. Mishra U., and W.J. Riley. 2012. Active-layer, permafrost, and whole-profile depth variability of Alaskan soils. In: Minasny, B., Brendan M., and McBratney, A.B. (eds.) “Digital Soil Assessments and Beyond: Proceedings of the 5th Global Workshop on Digital Soil Mapping 2012”. CRC Press. p. 83-88.
10. Mishra U., and R. Lal. 2011. Predictive mapping of soil organic carbon: A case study using geographic weighted regression approach. In: Clay, D. and Shanahan, J. (eds.) “GIS Applications in Agriculture– Nutrient Management for Improved Energy Efficiency”. CRC Press. p. 209-233.

### **BOOK EDITED**

- Zhangcai C., Mishra U., and Hastings A. (eds.) “Bioenergy and land use change” John Wiley & Sons, Inc., NJ, USA and the American Geophysical Union, Washington, D.C., USA, ISBN: 978-1-119-29734-5.

### **PROFESSIONAL SERVICE**

#### **1. Chair, International Soil Science Award Committee**

- Soil Science Society of America, Jan 2021 – Dec 2021; Jan 2022 – Dec 2022; Jan 2023 – Dec 2023

#### **2. Chair, Soil and the Critical Zone Processes Technical Committee**

- American Geophysical Union (Jan 2020 – Dec 2020).

#### **3. Co-chair, Data & observation model link panel and Executive board member**

- International Soil Modeling Consortium (2017 – 2019, 2020 – present).

#### **4. Member, Committee on budget and finance**

- International Union of Soil Science, Jan 2023 – present

#### **5. Member, International Soil Science Award Committee**

- Soil Science Society of America, Jan 2019 – Dec 2019; Jan 2020 – Dec 2020.

#### **6. Member, Rien van Genuchten Award & Early Career Award committees**

- International Soil Modeling Consortium (2018).

#### **7. Member, Fellows Committee**

- Soil Science Society of America, Jan 1, 2018 – Dec 31, 2019.

#### **8. Member, Soil Science Research Award Committee**

- Soil Science Society of America, Jan 1, 2015 – Dec 31, 2016.

#### **9. Member, Editorial Board**

- Associate Editor, Soil Science Society of America Journal (2022 – present)
- Associate Editor, Vadose Zone Journal, Soil Science Society of America publication (2014 – 2022)
- Technical Editor, Agronomy Journal, American Society of Agronomy publication (2019 – 2021)
- Associate Editor, Korean Journal of Soil Science and Fertilizer (2014 – 2017)
- Associate Editor, Agronomy Journal, American Society of Agronomy publication (2009 – 2012, 2012 – 2015)

#### **10. Journal Reviewer:** Reviewed one or more manuscripts for different journals

\* Arctic, Antarctic, and Alpine Research \* Agricultural & Environmental Letters \* Agriculture, Ecosystems, and Environment \* Agronomy Journal \* Applied and Environmental Soil Science \* Archives of Agronomy & Soil science \* Biogeosciences \* Biomass & Bioenergy \* Carbon Management \* Catena \* Climatic Change \* Computers and Geosciences \* Ecosystems \* Environment International \* Environmental Monitoring and Assessment \* Environmental Research Letters \* European Journal of Soil Science \* Frontiers in Soil Science \* Frontiers in Ecology and the Environment \* Frontiers in Soil Science \* Geoderma \* Geophysical Research Letters \* Geoscientific Model Development \* Global Biogeochemical Cycles \* Global Change Biology \* Global Change Biology Bioenergy \* International Journal of Agronomy \* International Journal of Geographical Information Science \* Journal of Environmental Management \* JGR-Atmospheres \* JGR- Biogeosciences \* JGR- Earth Surface \* Land Degradation and Development \* Nature Communications \* Northern Journal of Applied Forestry \* Nutrient Cycling in Agroecosystems \* Pedosphere \* Plant & soils \* Plos one \* Polar Research \* Precision Agriculture \* Resources, conservation & Recycling \* Science Advances \* Science of the Total Environment \* Scientific Reports \* Sustainable Energy Technologies and Assessments \* Soil \* Soil Science \* Soil Science Society of America Journal \* Soil & Tillage

Research \* USDA publications \* USGS publications \* Vadose Zone Journal.

**11. Proposal Reviewer:** Reviewed one or multiple proposals for following agencies

- United States Department of Agriculture
- National Science Foundation, USA
- Swiss National Science Foundation
- National Aeronautics and Space Administration
- U.S. Department of Energy
- Croatia Science Foundation
- Ontario Ministry of Agriculture, Canada

**12. Conference session convener:**

- Modelling biogeochemical fluxes and organic carbon dynamics in soil systems– International Soil Modeling Consortium, Tianjin University, China, May 18 -21, 2021 (organized virtually).
- Permafrost, peat and frozen soils – International Soil Modeling Consortium, Wageningen, Netherlands, Nov 5-7, 2018.
- Biofuel-induced land use land cover change and its biogeochemical and biophysical impacts- American Geophysical Union Fall meeting 2015.
- Agriculture and land management impacts on soil carbon processes- Soil Science Society of America annual meeting, Nov 2-5, 2014.
- Environmental aspects of bioenergy production- American Geophysical Union Fall meeting 2010.

**13. Chair, EVS Seminar series**

- Chair, Environmental Science Division seminar series, Argonne National Laboratory (2012 - 2016).

**14. Outstanding Student Paper Awards Judge**

- Judge, Outstanding Student Paper Awards, American Geophysical Union (2011, 2012, 2013, 2014).
- Judge, Graduate Student presentations, Soil Science Society of America (2014).

**SELECTED INVITED PRESENTATIONS**

1. Mishra, U. 2022. Current knowledge on soil carbon storage and dynamics and remaining challenges, Bjerknes Center for Climate Research, Bergen, Norway, Nov. 21, 2022.
2. Mishra, U. 2022. Current knowledge on soil carbon storage and dynamics and remaining challenges, Norwegian University of Science and Technology, Trondheim, Norway, Nov. 23, 2022.
3. Mishra, U. 2022. Current knowledge on soil carbon storage and dynamics, Korean Society of Soil Science and Fertilizers, Jeju, South Korea, Oct. 20, 2022.

4. Mishra, U. 2022. Machine learning to investigate soil organic carbon storage and dynamics, University of California, Santa Cruz, CA, Sep. 26, 2022.
5. Mishra, U. 2022. Carbon farming: a tool to mitigate climate change and enhance food security, California State University Fresno, Sep. 14, 2022 (virtual seminar).
6. Mishra, U. 2022. Fundamental soil science to enhance Earth system predictability, Soils in the climate crisis: Modeling Microbiome During Disturbance, Sandia National Laboratories, June 9, 2022 (virtual workshop).
7. Mishra, U. 2022. Carbon farming: a tool to mitigate climate change and improve soil health, ADRA International, Apr 7, 2022 (virtual seminar).
8. Mishra, U. 2022. Predicting land use and climate change impacts on soil carbon, What is water's role in a carbon neutral future? Sandia National Laboratories, Apr 4-6, 2022 (virtual seminar).
9. Mishra, U. 2022. Investigating soil carbon vulnerability and bioenergy sustainability under changing climate, Bioenergy's role in soil carbon storage workshop, DOE-BETO, Mar 28-29, 2022 (virtual seminar).
10. Mishra, U. 2022. Observed and modeled environmental controls of regional and global SOC stocks, Forest Soil carbon and Beyond, International online workshop, Mar 1-3, 2022 (virtual seminar).
11. Mishra, U. 2021. Predicting land use and climate change impacts on soil organic carbon, Sandia – Illinois Climate Workshop, Nov 18, 2021 (virtual seminar)
12. Mishra, U., K. Yeo, S. Gautam, K. Nyaupane and K Adhikari. 2021. Machine learning to investigate soil carbon storage and dynamics, Ecological Society of America, Long Beach, CA, Aug 6- 10, 2021 (virtual seminar).
13. Tao, F., Y. Huang, B.A. Hungate, X. Lu, T. D. Hocking, U. Mishra, G. Hugelius, X. Huang, and Y. Liu. 2021. PROcess-guided deep learning and DATA-driven modelling uncovers key mechanisms underlying global soil carbon storage, International Soil Modeling Consortium, Tianjin University, China, May 21, 2021 (virtual conference).
14. Mishra, U. 2021. Applications of machine learning to soil carbon research, 4th Training course on New Advances in Land Carbon Cycle Modeling, Northern Arizona University, May, 17-28, 2021 (organized virtually).
15. Mishra, U. 2021. Use of machine learning to investigate soil organic carbon storage and dynamics, University of Arizona, Tuscon, AZ, Apr 29, 2021 (virtual seminar).
16. Mishra, U. 2021. Spatial heterogeneity and environmental predictors of permafrost region soil organic carbon, Interagency Arctic Research Policy Committee, Mar 30, 2021 (virtual seminar).
17. Mishra, U. 2020. Investigating land use and climate change impacts on soil organic carbon, Lawrence Livermore National Laboratory, Livermore, CA, Dec 8, 2020 (virtual seminar).

18. Mishra, U. 2020. Machine learning to investigate soil organic carbon storage and dynamics, NASA Jet Propulsion Laboratory, Pasadena, CA, Apr 30, 2020 (virtual seminar).
19. Mishra, U., S. Gautam, T. Huntington, and C. Scown. 2020. Comparing machine learning with process-based models: Biomass and soil organic carbon predictions, Inter- Bioenergy Research Center Machine Learning/Artificial Intelligence Workshop, Washington DC, Feb 26-27, 2020.
20. Scown, C., T. Huntington, and U. Mishra. 2020. Machine learning for predicting feedstock yields, biofuel production costs, and emissions, Inter-Bioenergy Research Center Machine Learning/Artificial Intelligence Workshop, Washington DC, Feb 26-27, 2020.
21. Mishra U. 2019. Predicting land use and climate change impacts on soil organic carbon, Kangwon National University, South Korea 06/24/2019.
22. Mishra, U., S. Gautam, and E. Mass. 2019. Predicting land use change induced biogeochemical changes, Modeling Approaches to Develop Sustainable Biofuels: A Joint Bioenergy Research Center Workshop, Chicago, IL, May 2-3, 2019.
23. Mishra, U., and F. Wang. 2019. Marginal lands for bioenergy crops, Modeling Approaches to Develop Sustainable Biofuels: A Joint Bioenergy Research Center Workshop, Chicago, IL, May 2-3, 2019.
24. Mishra U. 2018. Improving soil carbon representation in earth system models using field observations and geospatial science, Ghent University, Belgium. 11/09/2018.
25. Mishra U. 2018. Soil properties of permafrost systems and their representation in earth system models, International Soil Reference and Information Centre, Wageningen, Netherlands. 11/08/2018.
26. Mishra U. 2018. Soil sustains humanity, OutLoud lecture series, Argonne National Laboratory, Illinois, USA. 06/15/2018.
27. Mishra U. 2017. Informing land surface models with observations and geospatial science, Pedotransfer functions in Earth System Sciences; Challenges and perspectives, International Soil Modeling Consortium, New Orleans, Louisiana, USA. Dec 10, 2017.
28. Mishra U., G. Hugelius, Y. Yang, and The Permafrost Carbon Network. 2017. Spatial and vertical heterogeneity of permafrost soil organic carbon stocks, 7th Annual Meeting of the Permafrost Carbon Network, New Orleans, Louisiana, USA. Dec 10, 2017.
29. Mishra U. 2017. Characterizing and using spatial heterogeneity of soil carbon stocks, Korea Polar Research Institute, South Korea 05/22/2017.
30. Mishra U. 2017. Informing earth system models using soil carbon observations and geospatial science, Korean Society of Soil Science and Fertilizer annual meeting, South Korea 05/19/2017.

31. Mishra U. 2017. Soil-forming processes and factors regulating the spatial heterogeneity of soil carbon stocks, DOE-Environmental System Science PI Meeting, Washington D.C., USA. 04/26/2017.
32. Mishra U. 2016. Quantifying environmental controls on stocks, uncertainties, and scaling of soil organic carbon, American Geophysical Union Fall meeting, San Francisco, California, USA. 12/14/2016.
33. Mishra U. 2016. Benchmarking Earth System Models: An emerging domain in Earth System science, University of Illinois at Chicago, Illinois, USA 02/12/2016.
34. Mishra U., and S. Shijie. 2015. Recent advances in depth modeling of soil carbon storage, American Geophysical Union Fall meeting, San Francisco, California, USA. 12/17/2015.
35. Mishra U. 2015. Land carbon: A knowledge gap in the global carbon cycle, University of Peradeniya, Sri Lanka 11/20/2015.
36. Mishra U., B. Drewniak, and Z. Fan. 2015. Informing climate change studies using soil survey information, Soil Science Society of America annual meeting, Minneapolis, Minnesota, USA. 11/16/2015.
37. Mishra U. 2015. Quantifying climatic and anthropogenic impacts on soil organic carbon, Northwestern University, Evanston, Illinois, USA. 10/16/2015.
38. Mishra U., M.S. Torn, W.J. Riley, S. Ogle, and B. Drewniak. 2014. Predicting land use and climate change impacts on soil organic carbon at regional scales, Soil Science Society of America annual meeting, Long Beach, California, USA. 11/05/2014.
39. Mishra U., J. Jastrow, R. Matamala, K. Lagory, and J. Krummel. 2014. Environmental controls and spatial representation of soil properties across Alaska: comparison between geospatial and CMIP5 earth system models, Korea Polar Research Institute, South Korea 06/16/2014.
40. Mishra U., J. Jastrow, R. Matamala, K. Lagory, and J. Krummel. 2014. Benchmarking earth system models: A new domain for soil scientists, USDA-Natural Resource Conservation Services, Lincoln, Nebraska, USA. 03/18/2014.
41. Mishra U. 2012. Predicting climate and land use change impact on soil organic carbon stocks at regional scales, American Society of Agronomy annual meeting, Cincinnati, Ohio, USA. 10/21/2012.
42. Mishra U., 2012. Quantifying and predicting climatic and anthropogenic impacts on soil organic carbon pool, University of Sydney, Sydney, Australia 04/06/2012.
43. Mishra U., and M.S. Torn. 2011. Rainfed productivity of Miscanthus biomass on US croplands and its potential impact on soil organic carbon, International Society of Industrial Ecology, Berkeley, California, USA. 06/09/2011.
44. Mishra U., 2011. Terrestrial carbon sequestration: a local solution to global problems, Operation Research Society Nepal, Kathmandu, Nepal. 01/20/2011.



45. Mishra U., 2010. Predicting the storage and dynamics of soil organic carbon in terrestrial ecosystems, USGS Western Geographic Science Center, Menlo Park, California, USA. 08/25/2010.

### **CONTRIBUTED PRESENTATIONS**

1. Fan, C., Y. Song, S. Gautam, and U. Mishra. 2022. Mapping microbial functional diversity and it's environmental response for application in Earth system models, American Geophysical Union, Chicago, Dec 12-16, 2022.
2. Wang, Z., D. Sihi, J. Kumar, S.R. Weintraub-Leff, K. Todd-Brown, and U. Mishra. 2022. Upscaling soil organic carbon measurements at the continental scale by multivariate clustering analysis and machine learning, American Geophysical Union, Chicago, Dec 12-16, 2022.
3. Qin, Z., K. Guan, W. Zhou, B. Peng, J. Tang, U. Mishra, A. Margenot. 2022. Assessing long-term impacts of cover crops on soil organic carbon in the central U.S. Midwestern agroecosystems, American Geophysical Union, Chicago, Dec 12-16, 2022.
4. Gautam, S., U. Mishra, and C.D. Scown. 2022. Reduced order models to project future trajectories of bioenergy crop yields and soil carbon changes, American Geophysical Union, Chicago, Dec 12-16, 2022.
5. Nyaupane, K., U. Mishra, and S. Gautam. 2022. Observation based benchmarks may improve representation of soil organic carbon in land surface models, American Geophysical Union, Chicago, Dec 12-16, 2022.
6. Yi Y., K. B. Dogaheh, M. Moghaddam, U. Mishra, and J. Kimball. 2022. Mapping surface organic soil properties in Arctic Tundra using C-band SAR data, American Geophysical Union, Chicago, Dec 12-16, 2022.
7. Mishra, U. and S. Gautam. 2022. Benchmarking model representation of soil organic carbon storage and dynamics, 8th International Symposium on Soil Organic Matter, Seoul, South Korea, June 26-30, 2022.
8. Mishra, U. 2022. Machine learning to investigate model representation of SOC Storage and dynamics, 22<sup>nd</sup> World Congress of Soil Science, Glasgow, Scotland, July 31-Aug 5, 2022.
9. Lara, M.J., A. Schore, E. Hall, C. Friedmann, W. Chen, D. Anderson, U. Mishra and S.N. Scott. 2022. Arctic-Boreal peatland mapping in Alaska: Implications for historical peat-fire dynamics, 16<sup>th</sup> International Circumpolar Remote Sensing Symposium, Fairbanks, Alaska May 16-20, 2022.
10. Hakes, R.S.P., S. Gautam, R.M. Hadden, M.W. Kury, M.K. Lara, S.S. McAllister, U. Mishra, and S.N. Scott. 2022. Peat fires and climate change: Modeling greenhouse gas emissions by 2100, International Association of Wildland Fire, Fire and Climate Conference, Pasadena, CA, USA, May 23-27, 2022.

11. Mishra, U. 2021. Soil carbon dynamics under changing land use and climate, Biosciences External Review Board meeting, Sandia National Laboratories, Oct 19-20, 2021 (virtual seminar).
12. Mishra, U. 2021. Predicting soil carbon storage and dynamics under changing climate, Geochemistry Department, Earth Sciences Division, Sandia National Laboratories, Nov 16, 2021.
13. Vitharana, U.W.A., N.J. Casson, M.M.S.M. Munasinghe, D. Kumaragamage, and U. Mishra. 2021. National scale mapping of soil physical and chemical properties, ASA-CSSA-SSSA International Annual Meeting, Salt Lake City, UT, Nov 7-10, 2021.
14. Gautam, S., U. Mishra, and C. Scown. 2021. Sustainable bioenergy crops in continental US cultivated lands, JBEI Annual review, Dec 6 -7, 2021.
15. Gautam, S., U. Mishra, C. Scown, and Y. Zhang. 2021. Sustainable bioenergy crops in continental US cultivated lands, American Geophysical Union, New Orleans, LA, Dec 13-17, 2021.
16. Song, Y., C. Fan, S. Gautam, and U. Mishra. 2021. Microbial functional composition across diverse environments: a dataset to parameterize and benchmark microbial-mediated soil organic matter decomposition models, American Geophysical Union, New Orleans, LA, Dec 13-17, 2021.
17. Kim, Y.J., D. Laffly, S-E Kim, L. Nilsen, J. Chi, Y. B. Lee, S.J. Jung, U. Mishra, Y.K. Lee, and J.Y. Jung. 2021. Factors affecting soil biogeochemical development in the glacier foreland of Midtre Lovenbreen, Svalbard, American Geophysical Union, New Orleans, LA, Dec 13-17, 2021.
18. Shi, Z., F.M. Hoffman, M. Xu, U. Mishra, S.D. Allison, and J.T. Randerson. 2021. Soil carbon-climate feedback during 21<sup>st</sup> century, American Geophysical Union, New Orleans, LA, Dec 13-17, 2021.
19. Gautam, S., U. Mishra and C.D. Scown. 2021. Environmental sustainability of bioenergy crops in continental United States, Joint BioEnergy Institute PI meeting, virtual, June 1-2, 2021.
20. Mishra, U. 2020. Soil organic carbon working group status and update, DOE-Regional and Global Model Analysis Principal Investigators meeting, virtual, Oct 13-16, 2020.
21. Mishra, U., F. Hoffman, and W.J. Riley. 2020. Deriving functional relationships between environmental factors and soil organic carbon stocks, DOE-Regional and Global Model Analysis Principal Investigators meeting, online Oct 13-16, 2020.
22. Matamala, R., H. Dafeng, J. Jastrow, F. Calderon, C.-L. Ping, and U. Mishra. 2020. Understanding Composition and Decomposability of Arctic Soils by Integrating Laboratory Incubations with New Measurements and Models, American Geophysical Union Fall meeting, online, Dec 7-11, 2020.

23. Reid, P., E. Shelef, J. Rowland, J. Schwenk, and U. Mishra. 2020. Automated Mapping of Arctic Floodplains to Improve Estimates of Sediment and Carbon Fluxes, American Geophysical Union Fall meeting, online, Dec 7-11, 2020.
24. Tao, F., Y. Liu, and U. Mishra. 2020. Big data-driven modelling reveals key mechanisms underlying soil organic carbon stabilization, American Geophysical Union Fall meeting, online, Dec 7-11, 2020.
25. Vitharana, U.W.A., N. Casson, D. Kumaragamage, G. Gunn, S. Higgins, and U. Mishra. 2020. Spatial heterogeneity and environmental controllers of soil organic carbon stocks in a boreal forest, European Geophysical Union General Assembly, Vienna, Austria, May 3-9, 2020.
26. Gautam, S., U. Mishra, C. Scown, and Y. Zhang. 2019. Suitability analysis for biomass Sorghum production in the continental United States, American Geophysical Union Fall meeting, San Francisco, Dec 9-13, 2019.
27. Baatz, R., A.M. Tarquis, A. Verhoef, S. Painter, U. Mishra, J. Simunek, J. Vanderborght, U. Wollschläger, D. Or, M. van der Ploeg, M. Young, T. Ghezzehei, H. Vereecken. 2019. The International Soil Modeling Consortium (ISMC) – New Opportunities for Advancing Data and Modeling of Soil Systems, American Geophysical Union Fall meeting, San Francisco, Dec 9-13, 2019.
28. Scown, C., T. Huntington, X. Cui, and U. Mishra. 2019. Machine learning to predict bioenergy sorghum yields under future climate scenarios, American Geophysical Union Fall meeting, San Francisco, Dec 9-13, 2019.
29. Mass, E., U. Mishra, S. Gautam, Y. Wang, R. Ghimire, and R. Lal. 2019. A model ensemble approach to predicting future Sorghum cropping system effects at the field level, ASA-CSSA-SSSA International Annual Meeting, San Antonio, Nov 10-13, 2019.
30. Mishra, U., S. Gautam, and F. Wang. 2019. Marginal lands and agroecosystem models, Joint BioEnergy Institute PI meeting, Monterey, CA, May 28-30, 2019.
31. Gautam, S., E. Mass, and U. Mishra. 2019. Predicting land use change induced biogeochemical change, Joint BioEnergy Institute PI meeting, Monterey, CA, May 28-30, 2019.
32. Wang, F., and U. Mishra. 2019. A scientific framework to quantify marginal lands for bioenergy crop, Joint BioEnergy Institute PI meeting, Monterey, CA, May 28-30, 2019.
33. Mishra, U., J. Jastrow, R. Matamala, and The Permafrost Carbon Network. 2019. Harmonized high-resolution estimates of soil organic carbon stocks and its uncertainties in

- the permafrost region, DOE-Environmental System Science PI Meeting, Washington DC, Apr 30 - May 1, 2019.
34. Jastrow J., C. Sharp, C. Deck, T. Vugteveen, S. Hofmann, R. Matamala, J. Lederhouse, G. Michaelson, U. Mishra, and C-L Ping. 2019. Assessing the degradation state of soil organic matter in the permafrost region, DOE-Environmental System Science PI Meeting, Washington DC, Apr 30 - May 1, 2019.
  35. Matamala, R., N. Jelinski, J. Jastrow, C-L Ping, U. Mishra, T. Vugteveen, and J. Lederhouse. 2019. Soil morphology and organic matter distributions of Alaskan Arctic foothills toposequences, DOE-Environmental System Science PI Meeting, Washington DC, Apr 30 - May 1, 2019.
  36. Adhikari, K., U. Mishra, P.R. Owens, S. Wills, Z. Libohova, and D.M. Miller. 2019. Scale dependency of environmental variables on soil organic carbon prediction across the conterminous USA, Pedometrics, Guelph, Canada, June 2-6, 2019.
  37. Huntington, T., X. Cui, U. Mishra, and C. Scown. 2019. Machine learning for bioenergy sorghum yield prediction under future climate scenarios, DOE/BER Genomic Sciences Program Annual PI meeting, Washington DC, Feb 24-27, 2019.
  38. Baatz, R., J. Vanderborght, A. Verhoef, J. Simunek, M. van der Ploeg, D. Or, T. Ghezzehei, U. Wollschläger, A.M. Tarquis, S. Painter, U. Mishra, M. Young, H. Vereecken. 2019. The International Soil Modeling Consortium: ISMC status, goals and perspectives, European Geophysical Union, Vienna, Austria, April 7-12, 2019.
  39. Jastrow, J.D., R. Matamala, C-Lu Ping, T.W. Vugteveen, J.S. Lederhouse, G.J. Michaelson, and U. Mishra. 2019. Ice-wedge polygon formation impacts permafrost carbon storage and vulnerability to top-down thaw in Arctic Coastal plain soils, Soil Science Society of America, San Diego, CA, Jan 7-9, 2019.
  40. Jastrow, J.D., R. Matamala, C-Lu Ping, T.W. Vugteveen, J.S. Lederhouse, G.J. Michaelson, and U. Mishra. 2018. Potential decomposability of permafrost carbon stocks in ice-wedge polygons of the Alaskan Arctic coastal plain, American Geophysical Union, Washington DC, Dec 10-14, 2018.
  41. Rowland, J.C., J. Schwenk, E. Shelef, U. Mishra, J. D. Muss, and S.J. Stauffer. 2018. Pan-arctic flux of soil organic carbon to rivers by riverbank erosion, American Geophysical Union, Washington DC, Dec 10-14, 2018.
  42. Mishra, U., J. Jastrow, R. Matamala, and The Permafrost Carbon Network. 2018. Spatial heterogeneity and environmental controllers of organic carbon stocks of permafrost-affected soils, American Geophysical Union, Washington DC, Dec 10-14, 2018.

43. Mishra, U., D. Potma, and S. Wills. 2018. Impact of climatic factors on soil organic carbon stocks is soil and site specific in different United States ecoregions, 2nd International Soil Modeling Consortium conference, Wageningen, Netherlands, Nov 5-7, 2018.
44. Mishra, U., J. Jastrow, R. Matamala, and The Permafrost Carbon Network. 2018. Spatial heterogeneity and environmental controllers of permafrost SOC stocks, 21st World Congress of Soil Science, Rio, Brazil, Aug 12-17, 2018.
45. Adhikari, K., U. Mishra, P.R. Owens, S. Wills, and Z. Libohova. 2018. Scaling impacts on soil organic carbon stocks and its environmental controllers, 21st World Congress of Soil Science, Rio, Brazil, Aug 12-17, 2018.
46. Matamala, R., J. Jastrow, F. Calderon, S. Hoffmann, and U. Mishra. 2018. Determining soil organic matter composition and decomposability across the permafrost region using Mid-infrared spectroscopy, DOE-Environmental System Science PI Meeting, May 1-2, 2018.
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105. Mishra U., D. Clay, and T. Trooien. 2005. Using remote sensing based evapotranspiration maps to assess soil and crop yield variability, International conference of Pedometrics, Naples, Florida, USA.

### **PROFESSIONAL AFFILIATIONS**

- Pedometrics, International Union of Soil Science since, 2004.
- Soil Science Society of America, since 2006.
- Digital Soil Mapping working group, International Union of Soil Science, since 2008.
- American Geophysical Union, since 2009.
- International Soil Carbon Network, since 2009.
- American Association for the Advancement of Science, since 2009.
- Permafrost Carbon Network, since 2011.
- Cryosol working group, International Union of Soil Science, since 2014
- International Soil Modeling Consortium, since 2017.
- United States Permafrost Association, since 2021