Alison M. Hoyt

Assistant Professor of Earth System Science, Stanford University
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Education

Massachusetts Institute of Technology, Cambridge, MA
Ph.D., Civil & Environmental Engineering, September 2017
Thesis title: Carbon Fluxes from Tropical Peatlands
Advisor: Charles Harvey

University of Cambridge, Cambridge, UK
M.Phil. Environment, Society and Development, Dept. of Geography, June 2010
Engineering Research, Dept. of Engineering, October 2010-August 2011

Yale University, New Haven, CT
B.S. Physics & Engineering Sciences (Environmental), May 2009
Cum Laude, Distinction in Both Majors

Positions

Assistant Professor, Dept. of Earth System Science, Stanford University (Aug. 2021-present)

Postdoctoral Researcher, Max Planck Institue for Biogeochemistry (Sept. 2017 to Jul 2021)
- Advisor: Susan Trumbore. Research affiliate at Berkeley National Lab with Margaret Torn.

Awards

Best Thesis Award, MIT Dept of CEE, 2017
AGU Outstanding Student Paper Award, 2016
NSF Graduate Fellowship Honorable Mention, 2011
Paul Mellon Fellowship, full scholarship to University of Cambridge, 2009-2011
Henry Prentiss Becton Prize for Excellence in Engineering & Applied Science at Yale, 2009
Kirsten R. Lorentzen Award of the Association for Women in Science, 2007
Irmgard-Flugge-Lotz Memorial Scholarship of the Society of Women Engineers, 2005

Publications

[30] von Fromm, Sophie F., **A. M. Hoyt**, G. E. Acquah, E. Aynekulu, A. A. Berhe, S. M. Haefele, M. Lange, S. P. McGrath, K. D. Shepherd, A. M. Sila, J. Six, E. K. Towett, S. E. Trumbore, T.-G. Vågen, E. Weullow, L. A. Winowiecki, and S. Doetterl. Continental-scale controls on soil organic carbon across sub-Saharan Africa. ***SOIL***, 10.5194/soil-7-305-2021 (2021).

[29] Dadap, N.C., **A.M. Hoyt,** A.R. Cobb, D. Oner, M. Kozinski, P. V. Fua, K. Rao, C.F. Harvey, and A.G. Konings. Drainage canals in Southeast Asian peatlands increase carbon emissions. ***AGU Advances,*** 10.1029/2020AV000321 (2021).

[28] Loisel, J. *et al*. Expert assessment of future vulnerability of the global peatland carbon sink. ***Nature Climate Change,*** 10.1038/s41558-020-00944-0 (2021).

Publications Cont'd

[27] France, J.L., R.E. Fisher, D. Lowry, G. Allen, M. F. Andrade, S. J.-B. Bauguitte, K. Bower, T. J. Broderick, M. C. Daly, Grant Forster, MGondwe, C. Helfter, **A. M. Hoyt**, A. E. Jones, M. Lanoisellé, I. Moreno, P.. B. R. Nisbet-Jones, D. Oram, D. Pasternak, J. R. Pitt, U. Skiba, M.Stephens, S. E. Wilde and E. G. Nisbet. δ13C methane source signatures from tropical wetland and rice field emissions. **Phil. Trans. R. Soc. A** 380: 20200449. 10.1098/rsta.2020.0449 (2021).

[26] Doetterl, S., R. Asifiwe, G. Baert, F. Bamba, M. Bauters, P. Boeckx, B. Bukombe, G. Cadisch, L. Cizungu, M. Cooper, **A.M. Hoyt**, C. Kabaseke, K. Kalbitz, L. Kidinda, A. Maier, M. Mainka, J. Mayrock, D. Muhindo, B. Mujinya, S. Mukotanyi, L. Nabahungu, M. Reichenbach, B. Rewald, J. Six, A. Stegmann, L. Summerauer, R. Unseld, B. Vanlauwe, K. Van Oost, K. Verheyen, C. Vogel, F. Wilken, and P. Fiener. Organic matter cycling along geochemical, geomorphic and disturbance gradients in forests and cropland of the African Tropics - Project TropSOC Database Version 1.0. ***Earth System Science Data,*** 10.5194/essd-13-4133-2021, (2021).

[25] Beem-Miller, J., M. Schrumpf, **A. M. Hoyt**, G. Guggenberger, S. E. Trumbore. Impacts of drying and rewetting on the radiocarbon signature of respired CO_2 and implications for incubating archived soils. ***JGR Biogeosciences***, 10.1029/2020JG006119 (2021).

[24] Stoner, S., **A. M. Hoyt**, S. E. Trumbore, C. A Sierra, M. Schrumpf, S. Doetterl, T. Baisden, L. Schipper. Soil organic matter turnover rates increase to match increased inputs in grazed grasslands. ***Biogeochemistry***,10.1007/s10533-021-00838-z (2021).

[23] Heckman, K.A., C. E Hicks Pries, C. R. Lawrence, C. Rasmussen, S.E. Crow, **A.M. Hoyt,** S.F. von Fromm, Z. Shi, S. Stoner, C. McGrath, J. Beem-Miller, A.A. Berhe, J.C. Blankinship, M. Keiluweit, E. Marín-Spiotta, G. Monroe, A.F. Plante, J.P. Schimel, C.A. Sierra, A. Thompson, R. Wagai. Beyond bulk: Density fractions explain heterogeneity in global soil carbon abundance and persistence. ***Global Change Biology***, 10.1111/gcb.16023 (2021).

[22] Bukombe, B., P. Fiener, **A.M. Hoyt**, L.K. Kidinda, and S. Doetterl. Heterotrophic soil respiration and carbon cycling in geochemically distinct African tropical forest soils, ***SOIL*** 10.5194/soil-7-639-2021 (2021)

[21] Buessecker, S., Z. Zamora, A. F. Sarno, D. R. Finn, **A. M. Hoyt**, J. van Haren, J. D. Urquiza Muñoz, and H. Cadillo-Quiroz. Microbial communities and the putative interactions of methanogens with nitrogen oxides in diverse peatlands of the Amazon basin. ***Frontiers in Microbiology***, 10.3389/fmicb.2021.659079 (2021).

[20] **Hoyt, A.M.**, E. Chaussard, S.S. Seppalainen, C.F. Harvey. Widespread subsidence and carbon emissions across Southeast Asian peatlands. ***Nature Geoscience,*** 10.1038/s41561-020-0575-4 (2020).

[19] Shi, Z., S.D. Allison, Y. He, P.A. Levine, **A.M. Hoyt**, J. Beem-Miller, Q. Zhu, W.R. Wieder, S.E. Trumbore, J.T. Randerson. The age distribution of global soil carbon. ***Nature Geoscience,*** 10.1038/s41561-020-0596-z (2020).

[18] Gandois, L., **A.M. Hoyt**, S. Mounier, G. Le Roux, C.F. Harvey, A. Claustres, M. Nuriman, G. Anshari. From canals to the coast: Dissolved organic matter and trace metal composition in rivers draining degraded tropical peatlands in Indonesia. ***Biogeosciences,*** 10.5194/bg-17-1897-2020 (2020).

Publications Cont'd

[17] Estop-Aragonés, C., D. Olefeldt, B. Abbott, J. Chanton, C. Czimczik, J. Dean, J. Egan, L. Gandois, M. Garnett, I. Hartley, **A.M. Hoyt**, M. Lupascu, J. McClelland, S. Natali, J. O'Donnell, P. Raymond, A. Tanentzap, S. Tank, E. Schuur, M. Turetsky, K. Walter Anthony. A synthesis of ^{14}C measurements from the northern permafrost region: assessing the potential for mobilization of old soil carbon after permafrost thaw. ***Global Biogeochemical Cycles,*** doi:10.1029/2020GB006672 (2020).

[16] Lawrence, C.R., J. Beem-Miller, **A.M. Hoyt**, C. Monroe, C. Sierra, et al. An open source database for the synthesis of soil radiocarbon data: ISRaD version 1.0. ***Earth System Science Data,*** 10.5194/essd-12-61-2020 (2020).

[15] Lang, R., S.D. Goldberg, S. Blagodatsky, H-P. Piepho, **A.M. Hoyt**, R.D. Harrison, J. Xu, G. Cadisch. Mechanism of CH_4 uptake in profiles of tropical soils converted from forest to rubber plantations. ***Soil Biology and Biochemistry,*** 10.1016/j.soilbio.2020.107796 (2020).

[14] Schädel, C., J. Beem-Miller, M. Aziz Rad, S. E. Crow, C. Hicks Pries, J. Ernakovich, **A.M. Hoyt**, A. Plante, S. Stoner, C. C. Treat, and C. A. Sierra. Decomposability of soil organic matter over time: The Soil Incubation Database (SIDb, version 1.0) and guidance for incubation procedures. ***Earth System Science Data,*** 10.5194/essd-12-1511-2020 (2020).

[13] **Hoyt, A.M.**, L. Gandois, J. Eri, F.M. Kai, C.F. Harvey, A.R. Cobb. CO_2 emissions from an undrained tropical peatland: Interacting influences of temperature, shading and water table depth. ***Global Change Biology***, 10.1111/gcb.14702 (2019).

[12] Drake, T., K. Van Oost, M. Barthel, M. Bauters, **A.M. Hoyt,** D. Podgorski, J. Six, P. Boeckx, S. Trumbore, L. Cizungu Ntaboba, and R. Spencer. Mobilization of aged and biolabile soil carbon by tropical deforestation. ***Nature Geoscience*** 12, 541-546, 10.1038/s41561-019-0384-9 (2019).

[11] Gandois, L., **A.M. Hoyt**, C. Hatté, L. Jeanneau, R. Teisserenc, M. Liotaud, N.Tananaev. Contribution of peatland permafrost to dissolved organic matter along a thaw gradient in North Siberia. ***Environmental Science & Technology***, 10.1021/acs.est.9b03735 (2019).

[10] Metzler, H, Q. Zhu, W. Riley, **A.M. Hoyt**, M. Müller, C.A. Sierra. Mathematical reconstruction of land carbon models from their numerical output: computing soil radiocarbon from ^{12}C dynamics. ***Journal of Advances in Modeling Earth Systems***, 10.1029/2019MS001776 (2019).

[9] Dadap, N., A. Cobb, **A.M. Hoyt**, C. Harvey, A. Konings. Satellite soil moisture observations predict burned area in Southeast Asian peatlands. ***Environmental Research Letters*** 14:094014. 10.1088/1748-9326/ab3891 (2019).

[8] Malhotra, A., K.Todd-Brown, L.E. Nave, N.H. Batjes, J.R. Holmquist, **A.M. Hoyt,** C.M. Iversen, R.B. Jackson, K. Lajtha, C. Lawrence, O. Vindušková, W. Wieder, M. Williams, G. Hugelius, J. Harden. The landscape of soil carbon data: emerging questions, synergies and databases. ***Progress in Physical Geography*** 10.1177/0309133319873309 (2019).

[7] Bauters, M., O. Vercleyen, B. Vanlauwe, J. Six, B. Bonyoma, H. Badjoko, W. Hubau, **A.M. Hoyt,** M. Boudin, H. Verbeeck, P. Boeckx. Long-term recovery of the functional community assembly and carbon pools in an African tropical forest succession. ***Biotropica,*** 10.1111/btp.12647 (2019).

Publications Cont'd

[6] Sierra, C., **A.M. Hoyt**, Y. He, S.E. Trumbore. Soil organic matter persistence as a stochastic process: age and transit time distributions of carbon in soils. ***Global Biogeochemical Cycles*** 32, 1574–1588., 10.1029/2018GB005950 (2018).

[5] Apell, J.N., D.H. Shull, **A.M. Hoyt**, P.M. Gschwend. Investigating the effect of bioirrigation on in situ porewater concentrations and fluxes of polychlorinated biphenyls using passive samplers. ***Environmental Science & Technology***, 52, 8, 4565-4573, 10.1021/acs.est.7b05809 (2018).

[4] Hodgkins, S.B., C.J. Richardson, R. Dommain, H. Wang, P.H. Glaser, B. Verbeke, B.R. Winkler, A.R. Cobb, V.I. Rich, M. Missilmani, N. Flanagan, M. Ho, **A.M. Hoyt**, C.F. Harvey, S.R. Vining, M.A. Hough, T.R. Moore, P.J.H. Richard, B. Florentino, J. Toufaily, R. Hamdan, W.T. Cooper, J.P. Chanton. Tropical peatland carbon storage linked to global latitudinal trends in peat recalcitrance. ***Nature Communications***, 9, 3640, 10.1038/s41467-018-06050-2 (2018).

[3] Cobb, A., **A.M. Hoyt**, L. Gandois, J. Eri, R. Dommain, K. A. Salim, F. M. Kai, N. Salihah A.S., C.F. Harvey. How temporal patterns in rainfall determine the geomorphology and carbon fluxes of tropical peatlands. ***PNAS***, 10.1073/pnas.1701090114 (2017).

[2] Wijedasa, L.S. *et al.* Denial of long-term issues with agriculture on tropical peatlands will have devastating consequences. ***Global Change Biology****,* Letter to the Editor, 10.1111/gcb.13516 (2016).

[1] Gandois, L., R. Teisserenc, A. R. Cobb, H.I. Chieng, L. Lim, A.S. Kamariah, **A.M. Hoyt**, C.F. Harvey. Origin, composition, and transformation of dissolved organic matter in tropical peatlands. ***Geochimica et Cosmochimica Acta,*** 10.1016/j.gca.2014.03.012 (2014).

Invited Talks

Chicheley Hall, UK, *Royal Society Workshop on Radiocarbon in the Anthropocene* (deferred until 2021 due to COVID). Existing and Nascent ^{14}C Databases.

AsiaFlux Conference, Kuching, Malaysia (deferred until 2021 due to COVID). Widespread subsidence in Southeast Asian peatlands.

American Geophysical Union Fall Meeting, San Francisco, CA (Dec. 2020, planned). Widespread drainage, subsidence and CO_2 emissions in tropical peatlands.

University of California, Irvine, Lecturer at *Radiocarbon Short Course: Radiocarbon in Ecology and Earth Systems Science* (Aug. 2019).

University of Hohenheim, Stuttgart, Germany. *Institute of Tropical Agricultural Sciences Seminar Series* (Nov 2018). Carbon fluxes from tropical peatlands.

American Geophysical Union Fall Meeting, San Francisco, CA (Dec. 2017). Subsidence in tropical peatlands: Estimating CO_2 fluxes from peatlands in Southeast Asia.

Invited Talks Cont'd

Lamont Doherty Earth Observatory, Columbia University, New York. *Biology and Paleo-Environment Seminar Series* (Dec. 2016). Production and transport of CH_4 in a tropical peatland.

Nanyang Technological University, Singapore. *Tropical Peatlands, Past and Future: Ecosystem Processes & Environmental Change* (Aug. 2016). CH_4 fluxes and subsidence in tropical peatlands.

UK National Environment Research Council (NERC), *Methane Dynamics in the Tropics*, Chicheley Hall, UK (July 2014). Understanding hydrology and methanogenesis in a Bornean peat swamp forest.

Oral Presentations

+19 as contributing (non-presenting) author.

Hoyt, A.M., H. Cadillo-Quiroz, A.B. Pacaya, M. Jacobs, R.S. Pena, D.R. Navarro, D. Urquiza-Munoz, S.E. Trumbore. (Dec. 2019). Methane Emissions and Isotopic Composition along a Peatland Gradient in the Amazon. *American Geophysical Union Fall Meeting*, San Francisco, CA.

Hoyt, A.M., H. Cadillo-Quiroz, S. Pangala, L. Gandois, A. Cobb, V. Gauci, C. F. Harvey, S. E. Trumbore. (May 2019). Tropical Peatland Methane: Isotopes and Processes. Methane Observations and Yearly Assessments (MOYA) Annual Meeting, Egham, London, UK.

Hoyt, A.M., J. Beem-Miller, C. Sierra, S. Stoner, B. Ahrens, Q. Zhu, W. Riley, C. Lawrence, G. Monroe, S. Trumbore (April 2019). Timescales of Soil Carbon Cycling Across Latitudes. *European Geophysical Union General Assembly*, Vienna, Austria.

Hoyt, A.M., J. Beem-Miller, C. Sierra, S. Stoner, B. Ahrens, Q. Zhu, W. Riley, C. Lawrence, G. Monroe, S. Trumbore (Jan 2019). How Old Is C Respired from Soils? A Global Data Synthesis and Modeling Approach. *Soil Science Society of America International Soils Meeting*, San Diego, CA.

Hoyt, A.M., L. Gandois, A. Cobb, E. Corbett, S. Pangala, V. Gauci, C. Harvey (June 2017). Global Trends in Peatland Methane: An Isotope Approach. *Mer Bleue Meeting*, McGill, Montreal, Canada.

Hoyt, A.M., L. Gandois, A. Cobb, S. Pangala, V. Gauci, and C.F. Harvey (Apr. 2017). Pantropical Trends in Peatland Methane Fluxes. *European Geophysical Union General Assembly*, Vienna, Austria.

Hoyt, A.M., S. Pangala, L. Gandois, A. Cobb, V. Gauci, C.F. Harvey (Dec. 2016). Methane Oxidation in a Tropical Peatland. *American Geophysical Union Fall Meeting*, San Francisco, CA.

Hoyt, A.M., S. Pangala, L. Gandois, A. Cobb, F.M. Kai, X. Xu, V. Gauci, Y. Mahmud, A.S. Kamariah, J.A. Eri, C.F. Harvey (Aug. 2016). Methane Fluxes from a Tropical Peatland in Brunei Darussalam. *Proceedings of the 15th International Peat Congress*, Kuching, Malaysia.

Hoyt, A.M., E. Chaussard, S. Seppalainen, C.F. Harvey (Feb. 2016). Subsidence in Tropical Peatlands. *Mer Bleue Meeting*, McGill, Montreal, Canada.

Oral Presentations Cont'd

Hoyt, A.M., S. Pangala, L. Gandois, A. Cobb, F.M. Kai, X. Xu, V. Gauci, Y. Mahmud, A.S. Kamariah, J.A. Eri, C.F. Harvey (Dec. 2015). Methanogenesis in Peat Bogs - Insights from ^{14}C Data Synthesis and Modeling. *American Geophysical Union Fall Meeting*, San Francisco, CA.

Hoyt, A.M., N. Tananaev, C. Hatté, R. Teisserenc, C.F. Harvey, X. Xu, L. Gandois (Jul. 2015). Methanogenesis in Arctic Environments: What Can We Learn from Isotopic Techniques? *Lower Yenisei Observation Network Workshop*, Krasnoyarsk Krai, Siberia, Russia.

Hoyt, A.M., S. Pangala, L. Gandois, A. Cobb, F.M. Kai, X. Xu, V. Gauci, Y. Mahmud, A.S. Kamariah, J.A. Eri, C.F. Harvey (Mar. 2015). Peatland Methane Fluxes: The Importance of Lateral Transport. *Mer Bleue Meeting*, Montreal, Canada.

Hoyt, A.M., S. Pangala, L. Gandois, A. Cobb, F.M. Kai, X. Xu, V. Gauci, Y. Mahmud, A.S. Kamariah, J.A. Eri, C.F. Harvey (Dec. 2014). Methane Production and Transport in a Tropical Peatland. *American Geophysical Union Fall Meeting*, San Francisco, CA.

Hoyt, A.M., L. Gandois, A. Cobb, F.M. Kai, Ng J.L.B., A.S. Kamariah, Y. Mahmud, Jamilah J., Joffre A.A., N. Salihah A.S., C.F. Harvey (Dec. 2013). Hydrologic Control of Soil CO_2 Fluxes from Tropical Peat. *American Geophysical Union Fall Meeting*, San Francisco, CA.

Poster Presentations

+5 as contributing (non-presenting) author.

Hoyt, A.M., C.A. Sierra, C.R. Lawrence, H. Metzler, P.A. Levine, Z. Shi, J. Beem-Miller, S. Stoner, Q. Zhu, W. J Riley, M. Torn, G. Monroe, S. Allison, J. Randerson, S. Trumbore (Aug. 2019). Radiocarbon as a Constraint on Global Soil Carbon Cycling. *AGU Chapman Meeting on Understanding Carbon Climate Feedbacks*, San Diego, CA.

Hoyt, A.M., J. Beem-Miller, C.A. Sierra, S. Stoner, B. Ahrens, Q. Zhu, W. J Riley, C.R. Lawrence, G. Monroe, S. Trumbore (Dec. 2018). Respired Radiocarbon: Insights into decadal soil carbon cycling. *American Geophysical Union Fall Meeting*, Washington, DC.

Hoyt, A.M., S. Pangala, L. Gandois, A. Cobb, F.M. Kai, X. Xu, V. Gauci, Y. Mahmud, A.S. Kamariah, J.A. Eri, C.F. Harvey (Nov. 2015). Methane Fluxes from a Tropical Peatland. *Peat Carbon Accumulation on Earth (C-PEAT) Workshop*, Lamont Doherty Earth Institute, Columbia University, Palisades, New York.

Hoyt, A.M., A. Cobb, C.F. Harvey (Jun. 2012). Applications of Classical Models to Tropical Peat. *Proceedings of the 14th International Peat Congress.* Stockholm, Sweden.

Teaching & Mentoring

PhD Students supervised

- Jack Lamb (Stanford, primary supervisor, Sept'21-present)
- Sophie von Fromm (MPI, joint with S. Trumbore and S. Doetterl, Jun'19-present)
- Holly Blincow (Lancaster U., joint with S. Pangala, Sept'21-present)
- Antje Uhde (MPI, joint with S. Trumbore and C. Schmullius, Jan'22-present

MSc Students supervised

- Eleanor Walker (Stanford, primary supervisor, Sept'21-present)

Postdoctoral researchers supervised

- Scott Winton (Stanford, research scientist, primary supervisor, Jan'22-present)

Teaching & Mentoring Cont'd

Mentor for Student Research Projects (2014 - present)

- Radiocarbon incubations of archived soils (isotopes) - Jeffrey Beem-Miller (PhD), Current
- Soil C turnover in grasslands (isotopes, modeling) - Shane Stoner (PhD), Current
- Controls on soil C turnover in Congo (field, labwork) - Benjamin Bukombe (PhD), Current
- Methane in a Panama peatland (isotopes, fieldwork) - Alex Hedgpeth (PhD), Current
- Isotope labeled incubations to detect AOM (lab-based) - Andrey Vieira (BS), Summer 2016
- Subsidence rates in Sumatra (GIS, Python analysis) - Sandra Seppalainen (BS), Spring 2016
- Influence of decomposition on peat formation (field, labwork) - Judy Pu (BS), Summer 2014

Teaching Assistant, Groundwater Hydrology, MIT Subject 1.72, Fall 2012, Fall 2015
Delivered guest lectures, Matlab training, and recitations. Helped write and grade problem sets.

Workshop Co-organizer, Software Carpentry Scientific Programming Workshop, Fall 2013
Co-organized and obtained funding to bring 2.5-day scientific programming skills workshop to CEE department. Helped adapt standard Software Carpentry curriculum to earth science focus.

Professional Service and Affiliations

Workshop Organizer

- Soil Radiocarbon Workshop, New Orleans, LA, Dec 9-12, 2021
- Soil Radiocarbon Workshop, Lawrence Berkeley Laboratory, December 5-8, 2019
- ISRaD Hackathon, Max Planck Institute for Biogeochemistry, November 15-17, 2018
- Bay Area ISRaD Day, Stanford University, November 2, 2018.

Founding Developer & Steering Committee Member, International Soil Radiocarbon Database, (2018-present). Database design; Developed training materials; Led outreach sessions for the International Soil Radiocarbon Database (ISRaD).

Professional Service and Affiliations Cont'd

Convener

- EP028 Peatland dynamics, disturbance and restoration, *AGU Fall Meeting* 2020
- BG3.30 Tropical landscapes and peatlands: Biogeochemistry, ecohydrology and land use impacts, *EGU General Assembly* 2020
- SSS10.7 Scaling soil processes across space and time:leveraging models and data syntheses, *EGU General Assembly* 2020
- Soil carbon change and persistence in the Anthropocene, *AGU Fall Meeting* 2019.

Reviewer for: Nature Geoscience, Nature Communications, Journal of Geophysical Research (JGR) Biogeosciences, Global Change Biology (GCB), Global Biogeochemical Cycles (GBC), Journal of Advances in Modeling Earth Systems (JAMES), Geoscientific Model Development (GMD), Ecological Applications, Ecology Letters.

Member: American Geophysical Union, European Geophysical Union.