

# ALISON M. HOYT

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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

## 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

[27] 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).

[26] 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).

[25] Loisel, J. *et al.* Expert assessment of future vulnerability of the global peatland carbon sink. *Nature Climate Change* (in press).

[24] 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 <sup>14</sup>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 (in press).

[23] 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. *Biogeochemistry*, 10.5194/bg-17-1897-2020 (2020).

Current as of October 2020

**PUBLICATIONS  
CONT'D**

- [22] 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).
- [21] Lang, R., S.D. Goldberg, S. Blagodatsky, H-P. Piepho, **A.M. Hoyt**, R.D. Harrison, J. Xu, G. Cadisch. Mechanism of CH<sub>4</sub> uptake in profiles of tropical soils converted from forest to rubber plantations. *Soil Biology and Biochemistry*, 10.1016/j.soilbio.2020.107796 (2020).
- [20] 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).
- [19] **Hoyt, A.M.**, L. Gandois, J. Eri, F.M. Kai, C.F. Harvey, A.R. Cobb. CO<sub>2</sub> emissions from an undrained tropical peatland: Interacting influences of temperature, shading and water table depth. *Global Change Biology*, 10.1111/gcb.14702 (2019).
- [18] 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).
- [17] 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).
- [16] 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 <sup>12</sup>C dynamics. *Journal of Advances in Modeling Earth Systems*, 10.1029/2019MS001776 (2019).
- [15] 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).
- [14] 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).
- [13] Bauters, M., O. Verceleyen, 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).
- [12] 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).

## PUBLICATIONS CONT'D

- [11] 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).
- [10] 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).
- [9] 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).
- [8] 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).
- [7] 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).

## PUBLICATIONS IN REVIEW & SUBMITTED

- [6] **Hoyt, A.M.**, S.R. Pangala, L. Gandois, A.R. Cobb, V. Gauci, J.M.A. Incham, R.A. Zulki-flee, H.B.B.H. Idi, C.F. Harvey. Beyond surface fluxes: the methane budget of a tropical peatland. *Nature Climate Change* (in revision).
- [5] S. 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. *Environmental Microbiology* (in review).
- [4] 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* (submitted).
- [3] von Fromm, Sophie F., **A. M. Hoyt**, G. E. Acquah, E. Aynekulu, A. A. Berhe, S. M. Hae-fele, 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* (submitted).
- [2] Beem-Miller, J., M. Schrumppf, **A. M. Hoyt**, G. Guggenberger, S. E. Trumbore. Impacts of drying and rewetting on the radiocarbon signature of respired CO<sub>2</sub> and implications for incubating archived soils. *JGR Biogeosciences* (submitted).
- [1] Shane Stoner, S., **A. M. Hoyt**, S. E. Trumbore, C. A Sierra, M. Schrumppf, S. Doetterl, T. Baisden, L. Schipper. Soil organic matter turnover rates increase to match increased inputs in grazed grasslands. *Biogeochemistry* (submitted).

**INVITED TALKS** Chicheley Hall, UK, *Royal Society Workshop on Radiocarbon in the Anthropocene* (deferred until 2021 due to COVID). Existing and Nascent <sup>14</sup>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<sub>2</sub> 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<sub>2</sub> fluxes from peatlands in Southeast Asia.

Lamont Doherty Earth Observatory, Columbia University, New York. *Biology and Paleo-Environment Seminar Series* (Dec. 2016). Production and transport of CH<sub>4</sub> in a tropical peatland.

Nanyang Technological University, Singapore. *Tropical Peatlands, Past and Future: Ecosystem Processes & Environmental Change* (Aug. 2016). CH<sub>4</sub> 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.

**ORAL  
PRESENTATIONS  
CONT'D**

**Hoyt, A.M.**, L. Gandois, A. Cobb, S. Pangala, V. Gauci, and C.F. Harvey (Apr. 2017). Pan-tropical 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 15<sup>th</sup> 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.

**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 <sup>14</sup>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<sub>2</sub> 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 14<sup>th</sup> International Peat Congress*. Stockholm, Sweden.

## RESEARCH & TECHNICAL POSITIONS

**Postdoctoral Researcher**, Max Planck Institute for Biogeochemistry (Sept. 2017 to present)

- Advisor: Susan Trumbore. Research affiliate at Berkeley National Lab with Margaret Torn.

**Graduate Research Assistant**, MIT (2011-2017)

- Carbon cycle in tropical peatlands, Borneo (field campaigns 2012-2016).
- Permafrost methane emissions, Siberia (field campaigns 2015-2016).

**Hydrology & Water Supply Research Projects** (2008-2011)

- Research on impact of urbanization on groundwater resources, Santa Cruz, Bolivia (2010-11)
- Rural drinking water systems research project, Bui Division, Cameroon (2010)
- Modeled precipitation, stream discharge and DOC in Harvard Forest (2008-2009)
- Research on rural sanitation and drinking water supply in Alto Beni, Bolivia (Summer 2008)

## TEACHING & MENTORING

**Co-supervisor**, Sophie von Fromm, Ph.D. candidate at the Max Planck Institute for Biogeochemistry/ETH Zurich. “Understanding controls on organic matter stabilization in (sub)tropical soils”, jointly supervised with Susan Trumbore and Sebastian Doetterl, June 2019-present.

**Co-supervisor**, Ph.D. candidate at Lancaster University. “The role of lateral and tree transport in methane cycling in tropical peatlands”, jointly supervised by Sunitha Pangala and Niall McNamara, beginning 2021.

**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, 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* (planned)
- 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.

**REFERENCES**

**Prof. Charles F. Harvey**, MIT

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**Prof. Susan E. Trumbore**, Max Planck Institute for Biogeochemistry

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**Prof. Sebastian Dötterl**, ETH Zürich

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