

Charles Dunbar Koven

CONTACT INFORMATION

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RESEARCH INTERESTS

I study global climate change and the role of terrestrial ecosystems in governing climate feedbacks within the Earth system, with a focus on understanding the carbon dynamics of permafrost-affected and tropical forest ecosystems.

EDUCATION

University of California, Berkeley, CA
Ph.D., Environmental Science, Policy, and Management, December 2006
Yale University, New Haven, CT
B.S., Geology, May 1998

HONORS AND AWARDS

NERSC: Achievement Award for High Impact Science, 2016
LBNL: Director's Award for Exceptional Early Scientific Career Achievement, 2014
NASA: Earth System Science Fellowship 2004-2006
Yale University: Penfield prize for "Proficiency in Mineralogy", May 1998

PUBLICATIONS

2017

Slater, A. G., Lawrence, D. M., and **Koven**, C. D. Process-level model evaluation: a snow and heat transfer metric, *The Cryosphere*, 11, 989-996, doi:10.5194/tc-11-989-2017, 2017.

Swann, A. L. S., and **Koven**, C. D. A direct estimate of the seasonal cycle of evapotranspiration over the Amazon Basin. *Journal of Hydrometeorology*, doi:10.1175/JHM-D-17-0004.1

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Cervarich, M., Shu, S., Jain, A.K., Arneth, A., Canadell, J., Friedlingstein, P., Houghton, R.A., Kato, E., **Koven**, C., Patra, P. and Poulter, B., 2016. The terrestrial carbon budget of South and Southeast Asia. *Envir. Res. Lett.*, 11(10), p.105006. doi:10.1088/1748-9326/11/10/105006

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- 2011 **Koven** CD, Ringeval B, Friedlingstein P, Ciais P, Cadule P, Khvorostyanov D, Krinner G, Tarnocai C. (2011) Permafrost carbon-climate feedbacks accelerate global warming. *Proceedings of the National Academies of Science*, 108 (36), 14769–14774. doi:10.1073/pnas.1103910108
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- 2009 **Koven**, C. D., P. Friedlingstein, P. Ciais, D. Khvorostyanov, G. Krinner, and C. Tarnocai, (2009) On the formation of high-latitude soil carbon stocks: The effects of cryoturbation and insulation by organic matter in a land surface model. *Geophys. Res. Lett.*, (36), L21501, doi:10.1029/2009gl040150
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- DISCUSSION PAPERS
IN OPEN REVIEW Duarte, H. F., Raczka, B. M., Ricciuto, D. M., Lin, J. C., Koven, C. D., Thornton, P. E., Bowling, D. R., Lai, C.-T., Bible, K. J., and Ehleringer, J. R.: Evaluating the Community Land Model (CLM 4.5) at a Coniferous Forest Site in Northwestern United States Using Flux and Carbon-Isotope Measurements, *Biogeosciences Discuss.*, doi:10.5194/bg-2016-441, in review, 2016.

SELECTED
PRESENTATIONS

- C. Koven, G. Hugelius, D. M. Lawrence, W. Wieder. Climatological temperature sensitivity of soil carbon turnover: Observations, simple scaling models, and ESMs. AGU Fall Meeting, San Francisco, Dec. 2016.
- C. D Koven, D. M Lawrence, A. D. McGuire, A. G Slater, G. Hugelius, N Parazoo [Invited] Permafrost in ESMs: Recent Progress and Future Challenges. AGU Fall Meeting, San Francisco, Dec. 2016.
- C. D. Koven, B. Sulman, J. Harden, Y. He, D. Lawrence, L. Nave, J. O'Donnell, C. Treat, E. Kane. [Invited] Understanding global controls on soil carbon cycle profile predictions from vertically-resolved ESMs. AGU Fall Meeting, San Francisco, Dec. 2015.
- C. D. Koven et al., PInc-PanTher: The PCN Incubation-Panarctic Thermal Scaling Approach. AGU Fall Meeting, San Francisco, Dec. 2015.
- C. D. Koven et al., Productivity and turnover controls on terrestrial carbon feedbacks in the CMIP5 ESMs. ESA Annual Meeting, Baltimore, Aug. 2015.
- C. D. Koven [Invited] Projecting the carbon-climate feedback from thawing permafrost. Our Common Future under Climate Change, Paris, July 2015
- C. D. Koven [Invited] Sensitivity of permafrost thaw and carbon loss to warming. IUGG Conference, IUGG-IACS session on cryosphere processes in CMIP5 models, Prague, Czech Republic, June 2015
- C. D. Koven, D. M. Lawrence, W. J. Riley, M. S. Torn [Invited] Zero-D to One-D: Challenges and implications of considering vertical soil C profiles in ESMs. AGU Fall Meeting, San Francisco, Dec. 2014.
- C. D. Koven [Invited] Permafrost thaw and its role as a carbon cycle feedback to global warming. The Royal Society of London meeting: "Feedbacks on climate in the Earth system", London, Dec. 2014.
- C. D. Koven. A climate-analog, transport approach to estimating terrestrial carbon-climate responses. AGU Fall Meeting, San Francisco, Dec. 2013.
- C. D. Koven. Modeling terrestrial carbon-climate dynamics in the northern high latitudes. NCAR-ASP Colloquium, Carbon-climate connections in the Earth System, Boulder, CO, Aug. 2013.
- C.D. Koven, W.J. Riley. [Invited] Analysis of permafrost thermal dynamics and response to climate change in the CMIP5 models. AGU Fall Meeting, San Francisco, Dec. 2012.
- C.D. Koven, W.J. Riley, M.S. Torn, Z.M. Subin, J. Tang. Development, testing, and dynamics of a vertically-resolved C and N model in CLM4. AGU Fall Meeting, San Francisco, Dec. 2012.
- C. Koven, W. Riley, A. Stern. Analysis of permafrost thermal dynamics and response to climate change in the CMIP5 Earth System Models. Third International Conference on Earth System Modelling, Hamburg, Germany, Sep. 2012
- C. Koven, J. W. Harden, W. J. Riley, C.-L Ping, G. Hugelius, A.D. McGuire, P. Camill, T. Jorgenson, P. Kuhry, G. Michaelson, J. A. O'Donnell, E. A.G. Schuur, C. Tarnocai, K. Johnson, G. Grosse. Quantifying Permafrost C Vulnerable to Climate Change. Tenth International Conference on Permafrost, Salekhard, Russia, June, 2012

C. Koven. [Invited] Frozen Soil Carbon and its Impact on Climate Change. AAAS Annual Meeting, Vancouver, Canada, Feb. 2012

C. Koven, W. J. Riley, Z. M. Subin, J. Tang, M. Torn, J. Harden, D. Lawrence, G. Bonan, S. Swenson. Permafrost C and N Dynamics in CLM4, AGU Fall Meeting, San Francisco, Dec. 2011

C. Koven, B. Ringeval, P. Ciais, P. Friedlingstein, D. Khvorostyanov, G. Krinner, C. Tarnocai. The response of frozen soil respiration to warming controls the 21st century high-latitude carbon balance. AGU Fall Meeting, San Francisco, Dec. 2010

C. Koven, B. Ringeval, P. Ciais, P. Friedlingstein, D. Khvorostyanov, G. Krinner. Impact of frozen soil carbon processes on high latitude carbon balance, IPY Science Conference, Oslo, June 2010

C. Koven, P. Friedlingstein, P. Ciais, D. Khvorostyanov, G. Krinner. Emissions of CO₂ and CH₄ from decomposition of permafrost soil organic carbon under future climate scenarios in ORCHIDEE. International CO₂ Conference 8 (ICDC8), Jena, Germany, 2009

C. Koven, P. Friedlingstein, P. Ciais, D. Khvorostyanov, G. Krinner, Modelling permafrost carbon in ORCHIDEE: accumulation and fate under global warming scenarios. Carbon pools in permafrost regions (CAPP) 2nd Workshop, Stockholm, 2009

C. Koven, P. Friedlingstein, P. Ciais, D. Khvorostyanov, Fate of Permafrost Carbon in ORCHIDEE. EGU Spring meeting, Vienna, 2009

EXPERIENCE

Lawrence Berkeley National Lab, Berkeley, CA
Research Scientist June 2013-Present

Lawrence Berkeley National Lab, Berkeley, CA
Project Scientist Aug 2010-June 2013

Laboratoire des Sciences du Climat et de l'Environnement (LSCE), Gif-sur-Yvette, France
Postdoctoral Researcher CNRS / Chercheur CDD CNRS July 2008-July 2010

University of California, Berkeley, CA
Postdoctoral Researcher January 2007-June 2008

University of California, Berkeley, CA
Graduate Student Researcher September 2000-December 2006

University of California, Berkeley, CA
Teacher: Early Academic Outreach Program: Pre-College Academy July 2005

University of California, Berkeley, CA
Graduate Student Instructor: Biology 1B September-December 2001

ORGANIZATIONS AND OUTREACH

Contributing Author, Intergovernmental Panel on Climate Change Fifth Assessment, Working Group 1 report, Chapter 6 (Carbon and other biogeochemical cycles)
Working Group 2 report, Chapter 4 (Terrestrial and inland water systems)

Contributing Author, Arctic Monitoring and Assessment Program (AMAP) Short-lived Climate Forcers Expert Group Report on Methane

CESM Community Land Model and Biogeochemistry Working Groups

Member, LMWG Co-chair,	2010-Present 2017-Present
Member and Task lead, Permafrost Carbon Network	2011-Present
Scientific Advisory Board Member, Coupled Carbon Cycle Climate Model Intercomparison Project (C ⁴ MIP) for Coupled Model Intercomparison Project, Phase 6 (CMIP6)	2014-Present