

## CARRIE R. LEVINE, PhD

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Department of Environmental Science and Policy  
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### EDUCATION

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**University of California, Berkeley** May 2017

Department of Environmental Science, Policy, and Management  
PhD Candidate, Ecosystem Sciences

*"Forest resilience measured: Using a multi-timescale approach to quantify forest resilience in a changing world."*

**State University of New York, College of Environmental Science and Forestry** August 2011

Department of Forest and Natural Resource Management  
Master of Science, Forest Ecosystem Science

*"Assessing the suitability of rotary corers for sampling exchangeable cations in rocky soils."*

**Vassar College** May 2009

Biology Department  
Bachelor of Arts

*"White-tailed deer impacts on seed banks and sapling demography in eastern New York."*

### PEER-REVIEWED PUBLICATIONS

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Morueta-Holme, N., M. Oldfather, R.L. Olliff, A. Weitz, **C.R. Levine**, M.M. Kling, E. Riordan, C. Merow, P. Papper, S.N. Sheth, A.H. Thornhill, and D.D. Ackerly. Linguistic assumptions of unchanging climate. *In revision, Nature Climate Change*.

**Levine, C.R.**, C.V. Cogbill, B.M. Collins, A.J. Larson, J.A. Lutz, M.P. North, C.M. Restaino, H.D. Safford, S.L. Stephens, and J.J. Battles. 2017. Evaluating a new method for reconstructing forest conditions from General Land Office survey records. *Ecological Applications*, available online. doi: [10.1002/eap.1543](https://doi.org/10.1002/eap.1543).

**Levine, C.R.**, F. Krivak-Tetley, N.S. van Doorn, J.-A.S. Ansley, and J.J. Battles. 2016. Long-term demographic trends in a fire-suppressed mixed-conifer forest. *Canadian Journal of Forest Research* 46:745–752. doi: [dx.doi.org/10.1139/cjfr-2015-0406](https://doi.org/10.1139/cjfr-2015-0406).

Yang, Y., R.D. Yanai, F.R. Fatemi, **C.R. Levine**, P.J. Lilly, and R.D. Briggs. 2016. Sources of variability in tissue chemistry in northern hardwood species. *Canadian Journal of Forest Research* 46:285–296. doi: [10.1139/cjfr-2015-0302](https://doi.org/10.1139/cjfr-2015-0302).

Glassman, S.I., **C.R. Levine**, A.M. DiRocco, J.J. Battles, and T.D. Bruns. 2015. Ectomycorrhizal fungal spore bank recovery after a severe forest fire: Some like it hot. *The ISME Journal* 10:1228-1239. doi: [10.1038/ismej.2015.182](https://doi.org/10.1038/ismej.2015.182).

- Yanai, R.D., N. Tokuchi, J.L. Campbell, M.B. Green, E. Matsuzaki, S.N. Laseter, C.L. Brown, A.S. Bailey, P. Lyons, **C.R. Levine**, D.C. Buso, G.E. Likens, J. Knoepp, and K. Fukushima. 2014. Sources of uncertainty in estimating stream solute export from headwater catchments at three sites. *Hydrological Processes* 29(7):1793-1805. [doi: 10.1002/hyp.10265](https://doi.org/10.1002/hyp.10265).
- Levine, C.R.**, R.D. Yanai, G.G. Lampman, D.A. Burns, C.T. Driscoll, G.B. Lawrence, J.A. Lynch, and N. Schoch. 2014. Evaluating the efficiency of environmental monitoring programs. *Ecological Indicators* 39:94–101. [doi: 10.1016/j.ecolind.2013.12.010](https://doi.org/10.1016/j.ecolind.2013.12.010).
- Yanai, R.D., **C.R. Levine**, J.L. Campbell, and M.B. Green. 2012. Ecosystem budgets have no error: A progress report on quantifying uncertainty in forest ecosystem studies. *Journal of Forestry* 110(8):448–456. [doi: 10.5849/jof.11-087](https://doi.org/10.5849/jof.11-087).
- Levine, C.R.**, R.D. Yanai, M.A. Vadeboncouer, S.P. Hamburg, A.M. Melvin, C.L. Goodale, B.M. Rau, and D.W. Johnson. 2012. Assessing the suitability of rotary coring for sampling in rocky soils. *Soil Science Society of America Journal* 76(5):1707-1718. [doi:10.2136/sssaj2011.0425](https://doi.org/10.2136/sssaj2011.0425).
- Yanai, R.D., M.A. Arthur, M. Acker, **C.R. Levine**, and B.B. Park. 2012. Variation in mass and nutrient concentration of leaf litter across years and sites in New Hampshire northern hardwoods. *Canadian Journal of Forest Research* 42(8): 1597-1610. [doi:10.1139/x2012-084](https://doi.org/10.1139/x2012-084).
- Levine, C.R.**, R.J. Winchcombe, C.D. Canham, L.M. Christenson, M.L. Ronsheim. 2012. Deer impacts on seed banks and saplings in eastern New York. *Northeastern Naturalist* 19(1):49-66. [doi:10.1656/045.019.0104](https://doi.org/10.1656/045.019.0104).
- Fatemi, F.R., R.D. Yanai, S.P. Hamburg, M.A. Vadeboncoeur, M.A. Arthur, R.D. Briggs, **C.R. Levine**. 2011. Allometric equations for young northern hardwoods: the importance of age-specific equations for estimating aboveground biomass. *Canadian Journal of Forest Research* 41:881-891. [doi:10.1139/X10-248](https://doi.org/10.1139/X10-248).
- Wielopolski, L., R.D. Yanai, **C.R. Levine**, M.A. Vadeboncoeur, S. Mitra. 2010. Rapid, non-destructive carbon analysis of forest soils using neutron-induced gamma-ray spectroscopy. *Forest Ecology and Management* 206(7):1132-1137. [doi:10.1016/j.foreco.2010.06.039](https://doi.org/10.1016/j.foreco.2010.06.039).

## ADDITIONAL PUBLICATIONS

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- Levine, C.R.** 2011. Assessing the suitability of rotary corers for sampling exchangeable cations in rocky soils. Masters thesis, State University of New York, College of Environmental Science and Forestry, Syracuse, NY. ISBN: 9781124945811.

## RESEARCH & PROFESSIONAL EXPERIENCE

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|---|--------------------------|
| Postdoctoral Scholar, UC Davis  | Davis, CA (2017)         |
| Graduate Student Researcher, UC Berkeley                                  | Berkeley, CA (2012-2017) |
| Research Fellow, NY State Energy Research and Development Authority       | Albany, NY (2011-2012)   |
| Research Support Specialist, Quantifying Uncertainty in Ecosystem Studies | Syracuse, NY (2011)      |
| Graduate Student Research Assistant, SUNY-ESF                             | Syracuse, NY (2009-2010) |

## TEACHING EXPERIENCE

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Graduate Student Instructor: ES100: Introduction to the Methods of Environmental Science	UC Berkeley (2015-2016)
Visiting Instructor: FOR 798: Quantifying Uncertainty in Ecological Studies	SUNY-ESF (2012)
Teaching Assistant: FOR 338/538: Meteorology	SUNY-ESF (2010)
Teaching Assistant: FOR 332/532: Forest Ecology	SUNY-ESF (2009)

## FELLOWSHIPS, GRANTS, AND AWARDS

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John W. Humke Student Scholarship	Natural Areas Association (2016)
Graduate Division Summer Grant	ESPM, UC Berkeley (2016)
Outstanding Graduate Student Instructor Award	UC Berkeley (2016)
Frank Myers Forestry Scholarship Award	ESPM, UC Berkeley (2016)
LTER Travel Grant	NSF Long Term Ecological Research (2015)
Graduate Division Travel Grant	UC Berkeley (2015)
Baker-Bidwell Research Fellowship	ESPM, UC Berkeley (2015)
Ecosystems Sciences Summer Grant	ESPM, UC Berkeley (2015)
Conference Travel Award	Graduate Student Assembly, UC Berkeley (2014)
Departmental Fellowship	ESPM, UC Berkeley (2012-2013)
LTER Travel Grant	NSF Long Term Ecological Research (2012)
Albert L. Leaf Memorial Award	Dept Forest and Natural Resources Management, SUNY-ESF (2011)
C. Eugene Farnsworth Fellowship	Dept Forest and Natural Resources Management, SUNY-ESF (2011)
Graduate Student Travel Grant	Dept Forest and Natural Resources Management, SUNY-ESF (2011)
National Garden Club Scholarship	National Garden Club (2010)
Alec C. Proskine Award	Dept Forest and Natural Resources Management, SUNY-ESF (2010)
Sussman Foundation Fellowship	Edna Bailey Sussman Foundation (2010)
Graduate Student Travel Grant	Dept Forest and Natural Resources Management, SUNY-ESF (2010)
LTER Travel Grant	NSF Long Term Ecological Research (2009)
Sigma Xi Honor Society	Sigma Xi (2009)
Nancy Skinner Clark Fellowship	Biology Department, Vassar College (2009)
Environmental Research Institute Fellowship	Environmental Studies Program, Vassar College (2009)

## PROFESSIONAL DEVELOPMENT ACTIVITIES

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### Workshops attended:

- Hierarchical modeling workshop hosted by NIMBioS (Spring 2015)
- Supercomputing for ecological research workshop hosted by NIMBioS (Spring 2011)

**Society Member:** Ecological Society of America

**Journal Reviewer:** Environmental Monitoring and Assessment, Natural Resources Research, PLOS ONE, Rhodora, Soil Science Society of America Journal, Urban Forestry and Urban Greening

- Volunteer, Bay Area Scientists in Schools Berkeley, CA (2015)
- Engaged elementary and middle school students and teachers in hands-on classroom activities based in the California Science Standards
- Student Representative, ESPM Admissions Committee Berkeley, CA (2014-2015)
- Representative on the Admissions Committee for the ESPM Division of Ecosystem Sciences for the 2015 entering class
- Volunteer, Strawberry Creek Restoration Project Berkeley, CA (2014)
- Worked with high school students on wetland restoration and environmental education
- Volunteer, STEMposium presented by Youth Speaks Inc. Oakland, CA (2012)
- Engaged the community at large, with an emphasis on youth, in discussions about how science, technology, engineering, and math impact their community

### ***Additional Service Activities:***

- Volunteer, Pacific Association of Women Martial Artists Oakland, CA (2014-2016)
- Assist with data organization and data entry for surveys and member feedback
- Volunteer, Hand to Hand Kajukenbo and Self Defense Oakland, CA (2015-2016)
- Teach martial arts classes to beginning and intermediate students
- Volunteer, Lake Merritt Joggers and Striders Oakland, CA (2014-2015)
- Assist with data entry for registration and results of monthly races and race timing

## **WORKSHOPS AND WORKING GROUPS LED**

- September 11, 2012. Quantifying Uncertainty in Ecosystem Studies. Working group co-led with Ruth Yanai and John Campbell at the LTER All Scientists Meeting, Estes Park, CO.
- July 7, 2011. Quantifying Uncertainty in Ecological Studies. Workshop co-led with Ruth Yanai, Mark Green, and John Campbell at the Ecological Society of America Annual Meeting, Austin, TX.
- March 14-15, 2011. Quantifying uncertainty in ecosystem studies. Workshop co-led with Ruth Yanai, Mark Green, and John Campbell. Boston, MA. Attended by 15 representatives from 9 LTER sites.

## **INVITED LECTURES**

- April 19, 2017. **Levine, C.R.** and J.J. Battles. Dimensions of forest resilience: A working framework for management. *Hubbard Brook Ecosystem Study All-Scientists Meeting*, Millbrook, NY.
- March 2, 2017. **Levine, C.R.**, C.V. Cogbill, B.M. Collins, A.J. Larson, J.A. Lutz, M.P. North, C.M. Restaino, H.D. Safford, S.L. Stephens, and J.J. Battles. 2016. Reconstructing the historical forests of California. *UC Berkeley GeoLunch Series*, Berkeley, CA.
- September 26, 2014. **C.R. Levine**. Quantifying forest dynamics in a changing world. Portland State University, Portland OR.

## **PRESENTATIONS**

- Levine, C.R.**, C.V. Cogbill, B.M. Collins, A.J. Larson, J.A. Lutz, M.P. North, C.M. Restaino, H.D. Safford, S.L. Stephens, and J.J. Battles. 2016. Reconstructing the historical forests of California. *Natural Areas Association Conference*, Davis, CA.

- Levine, C.R.**, and J.J. Battles. 2016. Reconstructing the historical forests of California. *UC Berkeley Ecolunch Series*, Berkeley, CA.
- Levine, C.R.**, N.S. van Doorn, and J.J. Battles. 2015. Using Bayesian hierarchical models to estimate forest demographic processes. *Long-term Ecological Research All Scientists Meeting*, Estes Park, CO.
- Yanai, R.D., P.J. Lilly, M. Arthur, K. Bae, S.P. Hamburg, **C.R. Levine**, and M.A. Vadeboncoeur. 2015. Uncertainty in nutrient budgets in northern hardwood forests: Natural variation exceeds measurement error. Poster presented at the *Ecological Society of America Annual Meeting*, Baltimore, MD.
- Glassman, S.I., **C.R. Levine**, A.M. DiRocco, J.J. Battles, and T.D. Bruns. 2015. Ectomycorrhizal fungal spore bank recovery after a severe forest fire. *Ecological Society of America Annual Meeting*, Baltimore, MD.
- Levine, C.R.**, F. Krivak-Tetley, N. van Doorn, and J.J. Battles. 2015. Stand demography as an indicator of ecological resilience in an old-growth mixed conifer forest. Poster presented at the *Science for Parks, Parks for Science Conference*, Berkeley, CA.
- Lilly, P., R.D. Yanai, M. Arthur, K. Bae, S.P. Hamburg, **C.R. Levine**, and M.A. Vadeboncoeur. 2014. Uncertainty in accounting for C and nutrient accumulation or loss following forest harvesting. Poster presented at the *American Geophysical Union Fall Meeting*, San Francisco, CA.
- Levine, C.R.**, F. Krivak-Tetley, and J.J. Battles. 2014. Stand demography as an indicator of ecological resilience in an old-growth mixed conifer forest. *Ecological Society of America Annual Meeting*, Sacramento, CA.
- Yanai, R.D., K. Bae, **C.R. Levine**, C.R. See, M.A. Vadeboncoeur, S.P. Hamburg, and J.D. Blum. 2013. Sustainable forest harvest requires calcium supply from soil pools: Ecosystem budgets for second-growth northern hardwoods in New Hampshire. Poster presented at the *Ecological Society of America Annual Meeting*, Minneapolis, MN.
- Levine, C.R.**, R.D. Yanai, G.G. Lampman, D.A. Burns, C.T. Driscoll, G.B. Lawrence, J.A. Lynch, and N. Schoch. 2013. Optimizing environmental monitoring designs. *Ecological Society of America Annual Meeting*, Minneapolis, MN.
- Levine, C.R.**, R.D. Yanai, and G.L. Lampman. 2012. Assessment of Long-term Monitoring of Nitrogen, Sulfur, and Mercury Deposition and Environmental Effects in New York State. *National Atmospheric Deposition Program Annual Meeting*, Portland, ME.
- Levine, C.R.** 2012. Evaluating uncertainty in long-term monitoring data. *ILTER All Scientists Meeting*, Estes Park, CO.
- Levine, C.R.**, R.D. Yanai, and G.L. Lampman. 2012. Assessment of Long-term Monitoring of Nitrogen, Sulfur, and Mercury Deposition and Environmental Effects in New York State. *Ecological Society of America Annual Meeting*, Portland, OR.
- Levine, C.R.**, R.D. Yanai, J.L. Campbell, and M.B. Green. 2012. Quantifying Uncertainty in Ecosystem Studies. *Northeast Soil Monitoring Cooperative Annual Meeting*, Troy, NY.
- Levine, C.R.**, R.D. Yanai, J.L. Campbell, and M.B. Green. 2012. Quantifying Uncertainty in Ecosystem Studies. *Hubbard Brook Cooperators Meeting*, Millbrook, NY.
- Levine, C.R.** and R.D. Yanai. 2011. Assessing Long-Term Monitoring Programs for Sulfur, Nitrogen, and Mercury Deposition and Impacts in New York State. Poster presented at the *NYSERDA Environmental Monitoring, Evaluation and Protection Meeting*, Albany, NY.
- Levine, C.R.** and R.D. Yanai. 2011. Assessing Long-Term Monitoring Programs for Sulfur, Nitrogen, and Mercury Deposition and Impacts in New York State. Poster presented at the *National Atmospheric Deposition Program Fall Meeting*, Providence, RI.

- Yanai, R.D., **C.R. Levine**, M.B. Green, J.L. Campbell, and D. A. Burns. 2011. Nitrogen budgets without error? A progress report on Quantifying Uncertainty in forest Ecosystem Studies (QUEST). Poster presented at *American Society of Agronomy - Crop Science Society of America - Soil Science Society of America International Annual Meeting*, San Antonio, TX.
- Adams, M.B., **C.R. Levine**, J.L. Campbell, M.B. Green, R.D. Yanai, D.A. Burns, D.C. Buso, M.E. Harmon, T. Keenan, S.L. LaDeau, G.E. Likens, W.H. McDowell, J.N. Parman, S.D. Sebestyen, J. Vose, and M. Williams. 2011. Quantifying Uncertainty in Ecosystem Studies (QUEST): A cross-site comparison of watershed input-output budgets. Poster presented at the *Interagency Conference on Research in the Watersheds*, Fairbanks, AK.
- Levine, C.R.**, J.L. Campbell, M.B. Green, R.D. Yanai, M.B. Adams, D.A. Burns, D.C. Buso, M.E. Harmon, T. Keenan, S.L. LaDeau, G.E. Likens, W.H. McDowell, J.N. Parman, S.D. Sebestyen, J. Vose, and M. Williams. 2011. Quantifying Uncertainty in Ecosystem Studies (QUEST): A cross-site comparison of watershed input-output budgets. *The Ecological Society of America Annual Meeting*, Austin, TX.
- Green, M.B., D.C. Buso, J.L. Campbell, **C.R. Levine**, G.E. Likens, and R.D. Yanai. 2011. Long-term trends in uncertainty of element fluxes at the Hubbard Brook Experimental Forest. *The Ecological Society of America Annual Meeting*, Austin, TX.
- Rothfuss Dair, B., **C.R. Levine**, and M.C. Fisk. 2011. Nitrogen and phosphorus co-limitation of microbes in soil microcosms. Poster presented at the *Ecological Society of American Annual Meeting*, Austin, TX.
- Levine, C.R.**, R.D. Yanai, M.B. Green, J. Campbell, G.E. Likens, and D. Buso. 2011. QUEST: Quantifying uncertainty in Ecosystem Studies. *Hubbard Brook Ecosystem Study Annual Cooperators Meeting*, West Thornton, NH.
- Yanai, R.D., N. Tokuchi, M.B. Green, J. Campbell, **C.R. Levine**, and E. Matsuzaki. 2011. Hubbard Brook, Coweeta, and Wakayama (Japan): Sources of Uncertainty in Stream Export of Nutrients. *Hubbard Brook Ecosystem Study Annual Cooperators Meeting*, West Thornton, NH.
- Yanai, R.D., N. Tokuchi, M.B. Green, J. Campbell, **C.R. Levine**, and E. Matsuzaki. 2011. Nutrient cycling in forest ecosystems: Uncertainty in nutrient budgets. University of Tokyo, Tokyo, Japan.
- M.B. Adams, **C.R. Levine**, J.L. Campbell, M.B. Green, R.D. Yanai, D.A. Burns, D.C. Buso, M.E. Harmon, T. Keenan, S.L. LaDeau, G.E. Likens, W.H. McDowell, J.N. Parman, S.D. Sebestyen, J. Vose, and M. Williams. 2011. QUEST: Quantifying Uncertainty in Ecosystem Studies. *North American Forest Ecology Workshop*, Roanoke, VA.
- Levine, C.R.** 2011. Quantifying Uncertainty in Ecosystem Studies. Presentation in defense of Masters Thesis, SUNY-ESF, Syracuse, NY.
- Levine, C.R.**, R.D. Yanai, M.A. Vadeboncouer, and S.P. Hamburg. 2010. New techniques in soil sampling: methods for long-term ecological research. Poster presented at the *Ecological Society of America Annual Meeting*, Pittsburgh, PA.
- Levine, C.R.** Aboveground biomass and species composition at young, mid-aged, and mature stands at three sites in the White Mountains. 2010. *Hubbard Brook Ecosystem Study Annual Cooperators Meeting*, West Thornton, NH.
- Levine, C.R.**, R.D. Yanai, S.P. Hamburg, and M.A. Vadeboncoeur. 2010. Developments in soil sampling methods: testing the effects of power coring on several soil properties. Poster presented at *SUNY-ESF Spotlight on Graduate Student Research*, Syracuse, NY.
- Levine, C.R.**, R.D. Yanai, S.P. Hamburg, and T.K. Refsland. 2010. New techniques in soil sampling: methods for long-term ecological research. Poster presented at *Society of American Foresters NY Chapter Annual Meeting*, Syracuse, NY.

- Levine, C.R.** 2010. Estimating uncertainty in the Hubbard Brook phosphorus budget. *Hubbard Brook Ecosystem Study Committee of Scientists Meeting*, Millbrook, NY.
- Levine, C.R.**, M. Ronsheim, K. Van Camp, L. Christenson, R. Winchcombe, and C. Canham. 2009. White-tailed deer overabundance in the Northeastern US: Concerns for our future forests. Poster presented at *Environmental Consortium of Hudson Valley Colleges and Universities*, Poughkeepsie, NY.
- Levine, C.R.**, R.D. Yanai, S.P. Hamburg, and T.K. Refsland. 2009. New techniques in soil sampling: methods for long-term ecological research. Poster presented at *American Society of Agronomy - Crop Science Society of America - Soil Science Society of America International Annual Meeting*, Pittsburgh, PA.
- Levine, C.R.**, R.D. Yanai, S.P. Hamburg, and T.K. Refsland. 2009. New techniques in soil sampling: methods for long-term ecological research. Poster presented at *Rochester Academy of Science Annual Fall Scientific Paper Session*, Rochester, NY.
- Levine, C.R.**, R.D. Yanai, S.P. Hamburg, and T.K. Refsland. 2009. New techniques in soil sampling: methods for long-term ecological research. Poster presented at *LTER All-Scientists Meeting*, Estes Park, CO.
- Levine, C.R.** 2009. Quick but dirty: Can power coring replace soil pits? *Hubbard Brook Ecosystem Study Annual Cooperators Meeting*, West Thornton, NH.
- Christenson, L.M., M. Ronsheim, K. VanCamp, **C.R. Levine**, R. Winchcombe, and C. Canham. 2009. What to do with white-tailed deer? How Vassar College is managing. Poster presented at *Cary Conference*, Cary Institute of Ecosystem Studies. Millbrook, NY.