

# CURRICULUM VITAE

## WILLIAM S. KEETON, Ph.D.



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### EDUCATION

2000 Ph.D. Forest Ecology. University of Washington, College of Forest Resources, Seattle, WA.  
1994 M.E.S. Conservation Biology and Policy. Yale University, School of Forestry and Environmental Studies, New Haven, CT.  
1990 B.S. Natural Resources. Cornell University, College of Agriculture and Life Sciences, Ithaca, NY.

### PROFESSIONAL EXPERIENCE

2012-present Full Professor of Forest Ecology and Forestry. Rubenstein School of Environment and Natural Resources, University of Vermont, Burlington, VT.  
2010 - 2017 Director, University of Vermont Forestry Program  
2013-present Fellow, Gund Institute for Environment  
2010-present Senior Scientist. Spatial Informatics Group.  
Spring 2013 Guest Professor. University of Natural Resources and Applied Life Sciences (BOKU), Institute for Forest Ecology, Vienna, Austria  
2007-2012 Associate Professor of Forest Ecology and Forestry. Rubenstein School of Environment and Natural Resources, University of Vermont, Burlington, VT.  
Spring 2009 Visiting Scientist. University of Natural Resources and Applied Life Sciences, Institute for Forest Ecology, Vienna, Austria; Humboldt University, Geography Department, Berlin, Germany; University of Rome, Department of Plant Biology, Rome, Italy; IUCN (The World Conservation Union), Gland, Switzerland.  
Fall 2008 Fulbright Senior Scholar. Ukrainian National Forestry University, Institute for Ecological Economics, L'viv, Ukraine.  
2001-2007 Assistant Professor of Forest Ecology and Forestry. Rubenstein School of Environment and Natural Resources, University of Vermont, Burlington, VT.  
1997-2000 Research Assistant for the Climate Impacts Group. Joint Institute for the Study of Atmosphere and Oceans, University of Washington, Seattle, WA.  
1996-2000 Field Technician. College of Forest Resources, University of Washington, Seattle, WA.  
1994-1996 Consulting Conservation Biologist. The Wilderness Society, Seattle, WA.  
1993-1994 Consultant. IUCN – The World Conservation Union, Gland, Switzerland.  
1990-1992 Regulatory Analyst. Science Applications International Corporation, Washington, DC.  
1989 Legislative Intern. The Sierra Club, Legislative Office, Washington, DC

### OTHER PROFESSIONAL APPOINTMENTS

- Director, UVM Carbon Dynamics Laboratory (2007-present)
- Chair, IUFRO (International Union of Forest Research Organizations) Working Group on Old-growth Forests and Reserves (2015-present)
- Board of Trustees, Vermont Land Trust (2015-present)

- Board of Directors, Science for the Carpathians (2010-present).
- New York State Climate Change and Carbon Assessment, Technical Advisory Group (2020-present).
- Governing Committee. Institute for Environmental Diplomacy and Security (2010-present).
- Associate Editor, Georeview (2015-present)
- Board of Directors, VT/NH chapter of the American Chestnut Foundations (2015-2018)
- Co-Chair, Vermont Climate Collaborative, Agriculture, Forestry, and Waste Working Group (2009-2010)
- Chair, New England Society of American Foresters, Silviculture Working Group (2010-2012)
- Advisory Committee Member, Forest Ecosystem Monitoring Cooperative (2007-present)
- Science and Stewardship Advisory Board, The Nature Conservancy, Vermont Chapter (2008-2017)
- Joint University of Vermont/Agency of Natural Resources Panel on Emerging Carbon Markets (2007-2008)
- Vermont Agency of Natural Resources, Timber Harvesting Impacts Assessment Team (Appointee, 2012-present)
- Vermont Agency of Natural Resources, Voluntary Timber Harvesting Guidelines Working Group (Appointee, 2013-present)
- Vermont State Legislature, Biomass Energy Working Group (Appointee, 2009-2012)
- Vermont Roundtable on Parcelization and Forest Fragmentation (Invited participant, steering committee member, 2006-present)
- Forest Guild, Vermont Silviculture and Carbon Working Groups (2006-present)
- Intervale Conservation Nursery, Advisory Board (Invited member, 2006-present)
- Green Mountain National Forest, Climate Change Advisory Group (2006-2007)
- IUFRO (International Union of Forest Research Organizations), Landscape Ecology Working Group (2007-present)
- IUCN World Commission on Protected Areas, Mountain Protected Area Network (2009-present)
- IUCN (World Conservation Union), Commission on Ecosystem Management (2009-present)
- Science Advisory Committee, Remote sensing of forest transitions in mountain environments, Belgian Research Programme for Earth Observation (STEREO II) (2009-2014).

## AWARDS

- Lynne Bond Outstanding Service Learning [Faculty Award](#). 2019-2020
- Fulbright [Scholar Award](#). Austria, Spring 2021
- Fulbright Specialist Award. Ukraine, Fall 2008

## TEACHING EXPERIENCE

University of Vermont, Burlington, VT. Spring 2001- present

- Restoration Ecology (ENSC 201). Instructor (18 semesters).
- Sustainable Forest Management (FOR 272). Instructor (17 semesters).
- Forest Ecosystem Dynamics (FOR 385). Instructor (12 semesters).
- Forest Ecosystem Health (FOR 295). Instructor (1 Semester)
- General Ecology (NR 103). Instructor (1 semester).
- Multi-Resource Silviculture (1 semester)
- Ecosystem Management (NR 205). Instructor (13 semesters)



With UVM Environmental Science 201 class, after completing service learning project, April 2019

- Graduate Travel Course: Forests, Fire, and Bioenergy in New Mexico (NR 378, offered through Continuing Education). Co-instructor (1 semester)
- Graduate Travel Course: Ecological Economics and Sustainable Forest Management in the Carpathian Mountains, Ukraine (CDAE 295/NR 378). Co-Instructor (1 semester)
- Seminar in Sustainable Forest Certification (FOR 285/ENVS 295). Co-Instructor (1 semester)
- Seminar in Advanced Silviculture (FOR 285). Instructor (1 semester)
- Guest Lecturer: Silviculture; Field Naturalist Practicum; Measurements and Mapping; Vermont Field Studies; Geomorphology and Ecology of Mountain Landscapes; Climate Change Seminar; Watershed Science Field Studies, General Ecology, Introduction to Forest and Wildlife Conservation

Austrian University of Natural Resources and Life Sciences (BOKU), Vienna, Austria. 2013 and 2021

- Forest Carbon Science, Dynamics, and Management (Spring 2013; 1 semester graduate seminar)
- Global Forest Restoration (1 semester graduate course; planned for spring 2021)

University of Washington, Seattle, WA. 1997-2000

- Old-growth Forest Science and Management. Co-Instructor (1 semester)
- Ecosystem Dynamics. Teaching Assistant (1 semester)
- Field Studies in Ecosystem Management. Teaching Assistant (2 semesters)
- Landscape Ecology; Graduate Seminar on Climate Change (Guest Lecturer)

## PUBLICATIONS

### *In Review*

Covey, K. R., C. A. Bettigole, R. J. Warren, C. A. Williams, H. Gu, D. P. Aubrey, H. Asbjorsen, K. K. Bohn, A. T. Classen, T. W. Crowther, M. Farrell, B. R. Frey, E. J. Holzmueller, **W. S. Keeton**, B. O. Knapp, Jos. R. King, Karen K. Kuers, J. M. Lhotka, J. P. Love, D. S. Maynard, J. P. Megonigal, S. Pitz, N. E. Ruttenbeck, N. Sanders, M. R. Saunders, J. P. Stovall, K. Szlavecz, J. P. Wright, N. Wurzbarger, C. D. Oliver, X Lee1, and M. A. Bradford. Living trees are a major source of methane in temperate forests. Proceedings of the National Academy of Sciences.

### *Accepted*

Drever, C.R., S.C. Cook-Patton, F. Akhter, P.H. Badiou, G.L. Chmura, S.J. Davidson, R.L. Desjardins, A. Dyk, J.E. Fargione, M. Fellows, B. Filewod, M. Hessing-Lewis, S. Jayasundara, **W.S. Keeton**, T. Kroeger, T.J. Lark, E. Le, S.M. Leavitt, M.E. LeClerc, T.C. Lemprière, J. Metsaranta, B. McConkey, E. Neilson, G.P. St-Laurent1, D. Puric-Mladenovic, S. Rodrigue, R.Y. Soolanayakanahally, S.A. Spawn, M. Strack, C. Smyth, N. Thevathasan, M. Voicu, C.A. Williams, P.B. Woodbury, D.E. Worth, Z. Xu, S. Yeo, W.A. Kurz. Natural Climate Solutions for Canada. Science Advances.

### *Journal Papers*

Thom, D, Taylor, AR, Seidl, R, Thuiller, W, Wang, J, Robideau, **Keeton, WS**. Forest structure, not climate, drives functional diversity in northeastern North America. 2020. Science of the Total Environment.

Kameniar, O. ...**W.S. Keeton**...et al. (22 co-authors). Historical natural disturbances shape spruce primary forest structure and indirectly influence bird assemblage composition. Forest Ecology and Management 481: 118647.

- Sabatini F.M., **W.S. Keeton**, M. Lindner, M. Svoboda, P.J. Verkerk, J. Bauhus, H. Bruelheide, S. Burrascano, N. Debaive, I. Duarte, M. Garbarino, N. Grigoriadis, F. Lombardi, M. Mikoláš, P. Meyer, R. Motta, G. Mozgeris, L. Nunes, P. Ódor, M. Panayotov, A. Ruete, B. Simovski, J. Stillhard, J. Svensson, J. Szwagrzyk, O.P. Tikkanen, K. Vandekerkhove, R. Volosyanchuk, T. Vrska, T. Zlatanov, T. Kuemmerle. 2020. Protection gaps and restoration opportunities for primary forests in Europe. *Diversity and Distributions* 00: 1-17 DOI: 10.1111/ddi.13158
- Thom, D. and **W.S. Keeton**. 2020. Disturbance-based silviculture for habitat diversification: effects on forest structure, dynamics, and carbon storage. *Forest Ecology and Management*. 469: 118132
- Vilardell, L.V., **W. S. Keeton**, D. Thom, C. Gyeltshen, K. Tshering, and G. Gratzler. 2020. Climate change effects on wildfire hazards in the wildland-urban-interface – blue pine forests of Bhutan. *Forest Ecology and Management* 461:117927.
- Coleman, K., E. Perry, D. Thom, T. Gladkikh, **W.S. Keeton**, P. Clark, R. Tursini, and K. Wallin. 2020. The woods around the ivory tower: examining the value and relevance of school forests in the United States. *Sustainability*. 12(2): 1-16.
- Buchholz, T., **W.S. Keeton**, and J.S. Gunn. 2019. Economics of integrated harvests with biomass for energy in non-industrial forests in the northeastern US forest. *Forest Policy and Economics* 109: 102023.
- Mikoláš, M. I. Gallay, J. Vysoký, M. Čiliak, M. Jasík, P. Polák, V. Trotsiuk, M. Svoboda, K. Ujházy, G. Meigs, **W.S. Keeton**. 2019. Primary forest distribution and representation in a Central European landscape: results of a large-scale field-based census. *Forest Ecology and Management* 449.
- Thom, D., M. Golivets, L. Edling, G.W. Meigs, J.D. Gourevitch, L.J. Sontner, G.L. Galford, and **W.S. Keeton**. Climate sensitivity of carbon, timber, and species richness in the boreal-temperate ecotone co-varies with forest development. 2019. *Global Change Biology* 25:2446–2458.
- Thom, D., and **W.S. Keeton**. 2019. Stand structure drives divergences in carbon storage in northern hardwood-conifer forests. *Forest Ecology and Management* 442: 10-20.
- Kosiba, A., J. Duncan, J. Pontius, G. Meigs, **W.S. Keeton**, and E.R. Tait. 2018. Spatiotemporal patterns of forest disturbance in the Northeastern United States: 2000-2016. *Forest Ecology and Management* 430: 94-104.
- Meigs, G.W. and **W.S. Keeton**. 2018. Intermediate-severity wind disturbance in mature temperate forests: effects on legacy structure, carbon storage, and stand dynamics. *Ecological Applications* 28: 798-815.
- Fahey, R.T., B. C. Alvsherea, J.I. Burton, A.W. D'Amato, Y.L. Dickinson, **W.S. Keeton**, C.C. Kerne, A.J. Larson, B.J. Palik, K.J. Puettmann, M.R. Saunders, C.R. Webster, J.W. Atkins, C.M. Gough, and B.S. Hardimani. 2018. Shifting conceptions of complexity in forest management and silviculture. *Forest Ecology and Management* 421:59-71
- Kruhlov, I., D. Thom, O. Chaskovskyy, **W.S. Keeton** and R. M. Scheller. 2018. Future forest landscapes of the Carpathians: vegetation and carbon dynamics under climate change. *Regional Environmental Change* 18:1555-1567.
- Sabatini, F.M., S. Burrascano, **W.S. Keeton**, and 32 co-authors. 2018. Where are Europe's last primary forests? *Diversity and Distributions* 24:1426-1439
- Gratzler, G. and **W.S. Keeton**. 2017. Mountain forests and sustainable development: the potential for achieving the United Nations' 2030 agenda. *Mountain Research and Development* 37:246-253.
- Bölöni J., P. Ódor, R. Ádám, **W.S. Keeton**, and R. Aszalós. 2017. Dead wood in managed and unmanaged dry-mesic oak forests in the Hungarian Carpathians. *Forest Ecology and Management* 399: 120–131.
- Urbano, A.R. and **W.S. Keeton**. 2017. Forest structural development, carbon dynamics, and co-varying habitat characteristics as influenced by land-use history and reforestation approach. *Forest Ecology and Management*. 392: 21–35
- Ford, S.E. and **W.S. Keeton**. 2017. Enhanced carbon storage through management for old-growth characteristics in northern hardwoods. *Ecosphere* 8:1-20.
- Gottesman, A. and **W.S. Keeton**. 2017. Regeneration responses to management for old-growth characteristics in northern hardwood-conifer forests. *Forests* 8 (45): 1-21.
- Keeton, W.S.**, E. M. Copeland, and M.C. Watzin. 2017. Towards flood resilience: exploring linkages between riparian forest structure and geomorphic condition in northeastern U.S. streams. *Canadian Journal of Forest Research* 47: 476–487

- Egan, A., **W.S. Keeton**, C. Danks, I. Soloviy, and A. Zia. 2017. Forest carbon projects in the Ukrainian Carpathians: an assessment of potential community impacts and benefits. *Annals of Forest Research* 60:1-15.
- Bechtold, H.A., E.J., Rosi-Marshall, D.R. Warren, and **W.S. Keeton**. 2016. Forest age influences in-stream ecosystem processes in Northeastern US. *Ecosystems* 20: 1058-1071
- Warren, D.R., **W.S. Keeton**, P. M. Kiffney, M.J. Kaylor, H.A. Bechtold, and John Magee. 2016. Changing forests—changing streams: riparian forest stand development and ecosystem function in temperate headwaters. *Ecosphere* 7(8): 1-19.
- Kern, C. C., J. Burton, P. Raymond, A. D’Amato, **W.S. Keeton**, A.A. Royo, M.B. Walters, C.R. Webster, and J.L. Willis. 2016. Challenges facing gap-based silviculture and possible solutions for mesic northern forests in North America. *Forestry* 90: 4-17.
- Meigs, G.W., H.S.J. Zald, J.L. Campbell, **W.S. Keeton**, R.E. Kennedy. 2016. Do insect outbreaks increase forest fire severity? *Environmental Research Letters* 11: 045008.
- Keeton, W.S.** 2015. Forests and forestry in a changing world (Book Review). *Ecology* 96: 2670-2571.
- Mika, A. and **W.S. Keeton**. 2015. Net carbon fluxes at stand and landscape scales from wood bioenergy harvests in the U.S. Northeast. *Global Change Biology: Bioenergy*. 7: 438–454.
- Dove, N.C and **W.S. Keeton**. 2015. Structural complexity enhancement increases fungi diversity in northern hardwood forests. *Fungal Ecology* 13: 181-192.
- Kerchner, C. and **W.S. Keeton**. 2015. California’s regulatory forest carbon market: panacea or Pandora’s box for northeastern landowners? *Forest Policy and Economics* 50:70–81.
- Mikoláš, M. M. Svoboda, V. Pouska, R. C. Morrissey, D. C. Donato, **W. S. Keeton**, T. Nagel, V. D. Popescu, J. Müller, C. Bäessler, J. Knorn, L. Rozyłowicz, M. C. Enescu, V. Trotsiuk, P. Janda, H. Mrhalová, Z. Michalová, F. Krumm, and D. Kraus. 2014. Comment on the “Opinion paper: Forest management and biodiversity”: The role of protected areas is greater than the sum of its number of species. *Web Ecology* 14:61–64.
- Małek, S., J. Kazimierz, **W.S. Keeton**, J. Barszcz, M. Krocze, E. Błońska, and T. Wanic. 2014. Effects of fertilization on ecochemical soil conditions in mature spruce stands experiencing dieback in the Beskid Śląski and Żywiecki Mountains, Poland. *Water, Air, and Soil Pollution* 225:1971-1988.
- Russell-Roy, E.T, **W.S. Keeton**, J.A. Pontius, and C.D. Kerchner. 2014. Rehabilitation forestry and carbon market access on high-graded northern hardwood forests. *Canadian Journal of Forest Research*: 44: 614–627
- Buchholz, T., A.J. Friedland, C.E. Hornig, **W.S. Keeton**, G. Zanchi, and J. Nunery. 2014. Mineral soil carbon fluxes in forests and implications for carbon balance assessments. *Global Change Biology: Bioenergy* 6: 305–311
- Warren, D.R., **W.S. Keeton**, H. A. Bechtold, and E.J. Rosi-Marshall. 2013. Comparing streambed light availability and canopy cover in streams with old-growth versus early-mature riparian forests in western Oregon. *Aquatic Sciences*: 75:547–558
- Burrascano, S., **W.S. Keeton**, F.M. Sabatini, and C. Blasi. 2013. Commonality and variability in the structural attributes of moist temperate old-growth forests: A global review. *Forest Ecology and Management* 291:458–479.
- Mika, A. and **W.S. Keeton**. 2013. Factors contributing to carbon fluxes from bioenergy harvests in the U.S. Northeast: an analysis using field data. *Global Change Biology: Bioenergy* 5: 290–305.
- Knorn, J., T. Kuemmerle, V.C. Radeloff, **W.S. Keeton**, V. Gancz, I.A. Biris, M. Svoboda, P. Griffiths, A. Hagatis, and P. Hostert. 2013. Continued loss of temperate old-growth forests in the Romanian Carpathians despite an increasing protected area network. *Environmental Conservation* 40: 182–193.
- Littlefield, C. and **W.S. Keeton**. 2012. Effects of wood bioenergy harvesting on stand structural complexity and habitat characteristics in northern hardwood forests. *Ecological Applications* 22: 1892-1909.
- Schwenk, W.S., T.M. Donovan, **W. S. Keeton**, and J. S. Nunery. 2012. Carbon storage, timber production, and biodiversity: comparing ecosystem services with multi-criteria decision analysis. *Ecological Applications* 22:1612–1627.
- Gunn, J.A., D. J. Ganz, and **W.S. Keeton**. 2012. Biogenic vs. geologic carbon emissions and forest biomass energy production. *Global Change Biology* 4:239-242.

- Knorn, J., T. Kuemmerle, A. Szabo, M. Mindrescu, **W. S. Keeton**, V. C. Radeloff, I. Abrudan, P. Griffiths, V. Gancz, and P. Hostert. 2012. Forest restitution and protected area effectiveness in post-socialist Romania. *Biological Conservation* 146: 204–212.
- Keeton, W.S.**, A. A. Whitman, G.G. McGee, and C.L. Goodale. 2011. Late-successional biomass development in northern hardwood-conifer forests of the northeastern United States. *Forest Science* 57:489-505.
- Kraft, C., D. Warren, **W.S. Keeton**. 2011. Identifying the spatial pattern of wood distribution in northeastern North American streams. *Geomorphology* 135: 1-7
- Kuemmerle, T., P. Olofsson, O. Chaskovskyy, M. Baumann, K. Ostapowicz, C.E. Woodcok, R. Houghton, P. Hostert, **W.S. Keeton**, and V.C. Radeloff. 2011. Post-Soviet farmland abandonment, forest recovery, and carbon sequestration in western Ukraine. *Global Change Biology* 17:1335–1349.
- Main-knorn, M., G. G. Moisen, S. P. Healey, **W. S. Keeton**, E. A. Freeman, and P. Hostert. 2011. Evaluating the remote sensing and inventory-based estimation of biomass in the western Carpathians. *Remote Sensing* 3: 1427-1446.
- Pucko, C., B. Beckage, T. Perkins, and **W. Keeton**. 2011. Species shifts in response to climate change: individual or shared response? *Journal of the Torrey Botanical Society* 138:154-174.
- Nunery, J.S. and **W.S. Keeton**. 2010. Forest carbon storage in the northeastern United States: Net effects of harvesting frequency, post-harvest retention, and wood products. *Forest Ecology and Management* 259: 1363–1375.
- Keeton, W.S.** M. Chernyavskyy, G. Gratzer, M. Main-Korn, and Y. Bihun. 2010. Structural characteristics and aboveground biomass of old-growth spruce-fir stands in the eastern Carpathian Mountains, Ukraine. *Plant Biosystems* 11:1-12.
- Foster, B.C., D. Wang, **W.S. Keeton**, and M.S. Ashton. 2010. Implementing sustainable forest management globally using six management concepts in an adaptive management framework. *Journal of Sustainable Forestry* 29:79-108.
- Curzon, M.T. and **W.S. Keeton**. 2010. Spatial characteristics of canopy disturbances in riparian old-growth hemlock-northern hardwood forests, Adirondack Mountains, New York, USA. *Canadian Journal of Forest Research* 40:13-25.
- Stovall, J., **W.S. Keeton**, and C.E. Kraft. 2009. Forest-stream interactions: Fine-scale spatial variability in late-successional riparian forests structure, light, and periphyton abundance. *Canadian Journal of Forest Research* 29: 2343-2354.
- Warren, D.R., C.E. Kraft, **W.S. Keeton**, J.S. Nunery, and G.E. Likens. 2009. Dynamics of wood recruitment in streams of the northeastern U.S. *Forest Ecology and Management* 58:804-813.
- Kuemmerle, T., O. Chaskovskyy, J. Knorn, V.C. Radeloff, I. Kruhlov, **W.S. Keeton**, and P. Hostert. 2009. Forest cover change and illegal logging in the Ukrainian Carpathians in the transition period from 1988 to 2007. *Remote Sensing of Environment* 113:1194-1207.
- Ray, D.G., R.S. Seymour, N.S. Scott, and **W.S. Keeton**. 2009. Mitigating climate change with managed forests: balancing expectations, opportunity, and risk. *Journal of Forestry* 107(1): 50-51.
- Keeton, W.S.** 2008. Evaluation of seedling mortality and protective strategies in riparian restoration. *Northern Journal of Applied Forestry* 25:117-123.
- Smith, K.J., **W.S. Keeton**, M. Twery, and D. Tobi. 2008. Understory plant response to alternative forestry practices in northern hardwood-conifer forests. *Canadian Journal of Forest Research* 38:1-17.
- Manaras-Smith, K., **W.S. Keeton**, T.M. Donovan, and B. Mitchell. 2008. Stand-level forest structure and avian habitat: Scale dependencies in predicting occurrence in a heterogeneous forest. *Forest Science* 54:36-46
- Warren, D.R., **W.S. Keeton**, C.E. Kraft. 2008. Application of the line-intercept method for estimating wood volume in forested headwater streams. *Hydrobiologia* 598:123-130.
- Foster, B. C., D. Wang, and **W.S. Keeton**. 2008. A post-harvest comparison of structure and economic value in FSC certified and uncertified northern hardwood stands. *Journal of Sustainable Forestry* 26(3):1-21.
- Keeton, W.S.**, C.E. Kraft, and D.R. Warren. 2007. Mature and old-growth riparian forests: structure, dynamics, and effects on Adirondack stream habitats. *Ecological Applications* 17: 852-868.
- Keeton, W.S.** 2007. Role of managed forestlands and models for sustainable forest management: perspectives from North America. *George Wright Forum* 24(3):38-53.

- Sullivan, M.P., M.C. Watzin, and **W.S. Keeton**. 2007. A riverscape perspective on habitat associations among riverine bird assemblages: implications for conservation. *Landscape Ecology* 22:1169-1186.
- Keeton, W.S.** 2006. Managing for late-successional/old-growth characteristics in northern hardwood-conifer forests. *Forest Ecology and Management* 235: 129-142.
- McKenny, H.C., **W.S. Keeton**, and T.M. Donovan. 2006. Effects of structural complexity enhancement on eastern red-backed salamander (*Plethodon cinereus*) populations in northern hardwood forests. *Forest Ecology and Management* 230: 186-196.
- Keeton, W.S.** and J.F. Franklin. 2005. Do remnant old-growth trees accelerate rates of succession in mature Douglas-fir forests? *Ecological Monographs* 75:103--118.
- Keeton, W.S.** and J.F. Franklin. 2004. Fire-related landform associations of remnant old-growth trees in mature Douglas-fir forests. *Canadian Journal of Forest Research* 34: 2371-2381.
- Mote, P.W., E.A. Parson, A.F. Hamlet, K.G. Ideker, **W.S. Keeton**, D. Lettenmaier, N. Mantua, E.L. Miles, D.W. Peterson, D.L. Peterson, R. Slaughter, and A.K. Snover. 2003. Preparing for climate change: the water, salmon, and forests of the Pacific Northwest. *Climatic Change* 61:45-88.
- Franklin, J.F., T.A. Spies, R. Van Pelt, A. Carey, D. Thornburgh, D.R. Berg, D. Lindenmayer, M. Harmon, **W.S. Keeton**, D.C. Shaw, K. Bible, and J. Chen. 2002. Disturbances and the structural development of natural forest ecosystems with some implications for silviculture. *Forest Ecology and Management* 155:399-423.
- Pimentel, D., L. McLaughlin, A. Zepp, B. Lakitan, T. Kraus, P. Kleinman, F. Vancini, W.J. Roach, E. Graap, **W.S. Keeton**, and G. Selig. 1993. Environmental and economic effects of reducing pesticide use (reprinted from *BioScience*). *Agriculture Ecosystems and Environment* 46: 273-288.
- Pimentel, D., L. McLaughlin, A. Zepp, B. Lakitan, T. Kraus, P. Kleinman, F. Vancini, W.J. Roach, E. Graap, **W.S. Keeton**, and G. Selig. 1991. Environmental and economic effects of reducing pesticide use. *BioScience* 41: 402-409.

#### *USDA Forest Service General Technical Reports (peer-reviewed)*

- Keeton, W.S.** 2005. Managing for old-growth structure in northern hardwood forests. Pages 107-117 in: C.E. Peterson and D.A. Maguire (eds.). *Balancing ecosystem values: innovative experiments for sustainable forestry*. USDA Forest Service General Technical Report PNW-GTR-635.

#### *Peer Reviewed Book Chapters*

- Keeton, W.S.** Source or sink? Carbon dynamics in old-growth forests and their role in climate change mitigation. 2018. *Pages 267-288 in: Barton, A. and W.S. Keeton (eds.). Ecology and Recovery of Eastern Old-Growth Forests*. Island Press, Washington, D.C. 340 pp.
- Keeton, W.S.,** C. Lorimer, B. Palik, and F. Doyon. 2018. Silviculture for old-growth in the context of global change. *Pages 237-265 in: Barton, A. and W.S. Keeton (eds.). Ecology and Recovery of Eastern Old-Growth Forests*. Island Press, Washington, D.C. 340 pp.
- Warren, D.R., **W.S. Keeton**, H.A. Bechtold, and C.E. Kraft. Stream ecosystems in eastern old-growth forests. *Pages 159-178 in: Barton, A. and W.S. Keeton (eds.). Ecology and Recovery of Eastern Old-Growth Forests*. Island Press, Washington, D.C. 288 pp.
- Keeton, W.S.** and A. Barton. 2018. The past, present, and future of old-growth forests in the East. *Chapter 18 in: Barton, A. and W.S. Keeton (eds.). Ecology and Recovery of Eastern Old-Growth Forests*. Island Press, Washington, D.C. 288 pp.
- Keeton, W.S.,** P. Angelstam, M. Baumflek, Y. Bihun, M. Chernyavskyy, S. M. Crow, A. Deyneka, M. Elbakidze, J. Farley, V. Kovalyshyn, B. Mahura, S Myklush, J. R. Nunery, I. Solovity, and L. Zahvoyska. 2013. Sustainable forest management alternatives for the Carpathian Mountain region, with a focus on Ukraine. Pages 331-352 in J. Kozak, K. Ostapowicz, A. Bytnerowicz, and B. Wyzga (eds.) *The Carpathians: Integrating Nature and Society Towards Sustainability*. Springer-Verlag, Berlin and Heidelberg, Germany.
- Keeton, W.S.** and S.M. Crow. 2009. Sustainable forest management alternatives for the Carpathian Mountain region: providing a broad array of ecosystem service. Pages 109-126 in: I. Soloviy and W.S. Keeton (eds.).

- Ecological Economics and Sustainable Forest Management: Developing a Trans-disciplinary Approach for the Carpathian Mountains. Ukrainian National Forestry University Press, Lviv, Ukraine.
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### *Books*

- Barton, A. and **W.S. Keeton** (eds.). 2018. Ecology and Recovery of Eastern Old-growth Forests. Island Press, Washington, D.C. 340 pp.
- Soloviy, I. and **W.S. Keeton** (eds.). 2009. Ecological Economics and Sustainable Forest Management: Developing a Trans-disciplinary Approach for the Carpathian Mountains. Ukrainian National Forestry University Press, Lviv, Ukraine. 416 pp.
- Vogt, K.A., J.C. Gordon, J.P. Wargo, D.J. Vogt, H. Asbjornsen, P.A. Palmiotto, H. J. Clark, J.L. O'Hara, **W.S. Keeton**, T. Patel-Weynand, and E. Witten. 1997. Ecosystems: Balancing Science with Management. Springer-Verlag, New York, N.Y. 470 pp. (Also available in Mandarin Chinese).

### *Published reports*

- Keeton, W.S.**, W. VanDoren, C. Kerchner, and M. Fuqua. 2018. Vermont Forest Carbon: a Market Opportunity for Vermont Landowners. Vermont Land Trust, Montpelier, VT. 45 pp.
- Foster, D.R., K. Fallon Lambert, D. Kittredge, B. Donahue, C. Hart, W. Labich, S. Meyer, J. Thompson, M. Buchanan, J. Levitt, R. Perschel, K. Ross, G. Elkins, C. Daigle, B. Hall, E. Faison, A. D'Amato, R. Forman, P. Del Tredici, L. Irland, B. Colburn, D. Orwig, J. Aber, A. Berger, C. Driscoll, **W.S. Keeton**, R. Lilieholm, N. Pederson, A. Ellison, M. Hunter, and T. Fahey. 2017. Wildlands and Woodlands, Farmlands and Communities: Broadening the Vision for New England. Harvard Forest, Harvard University, Petersham, MA. 42 pp.
- Leonard, M. and 47 contributors. 2015. Voluntary Harvesting Guidelines for Landowners in Vermont. Vermont Department of Forests, Parks, and Recreation. Montpelier, Vermont. 65 pp.
- Saligman, L., E. Russell-Roy, **W.S. Keeton**, C. Danks, J. Gunn, and B. Machin. 2013. Can rehabilitative forestry and carbon markets benefit degraded forestland in Vermont? Final Report Prepared for Vermont Natural Resources Conservation Service, Conservation Innovation Grant# 69-1644-09-02. Conservation Collaboratives, Victory, VT. 62 pp.



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- Hayes, J.P., A. T. Herlihy, R. B. Jackson, G. P. Juday, **W. S. Keeton**, J. E. Leahy, B. R. Noon. 2011. Science Review of the US Forest Service Draft Environmental Impact Statement for National Forest System Land Management. Resolve, Washington, DC. 112 pp.
- Biomass Energy Working Group. 2011. Biomass Energy Development Working Group 2011 Interim Report. Legislative Council, Vermont State Legislature, Montpelier, VT. 54 pp.
- Foster, D.R., B.M. Donahue, D.B. Kittredge, K.F. Lambert, M.L. Hunter, B.R. Hall, L.C. Irland, R.J. Lilieholm, D.A. Orwig, A.W. D'Amato, E.A. Colburn, J.R. Thompson, J.N. Levitt, A.M. Ellison, **W.S. Keeton**, J. D. Aber, C.V. Cogbill, C.T. Driscoll, T.J. Fahey, C.M. Hart. 2010. Wildland and woodlands: a vision for the New England landscape. Harvard University Press, Cambridge, MA. 36 pp
- Foster, B.C., T.A. Robards, and **W.S. Keeton**. 2010 Carbon dynamics associated with even-aged forest management (CAR White Paper). Climate Action Reserve, Los Angeles, CA. 62 pp.
- Sleeper, D. (ed.), J. Andrews, L.A. Dupigny-Giroux, S. Faccio, J. Jenkins, **W.S. Keeton**, R. Kelley, J. Kellogg, T. Hanson, K. McFarland, E. Miller, H. Pembroke, R. Poirot, C. Rimmer, D. Ross, J. Shanley, T. Simmons, C. Still, T. Villars, B. Wemple, and S. Wilmot. 2009. Vermont's changing forests: key findings on the health of forested ecosystems from the Vermont Monitoring Cooperative. Vermont Monitoring Cooperative, South Burlington, VT. 40 pp.
- Bihun, Y.M., **W.S. Keeton**, O. Stankiewicz, and M. Ceroni. 2008. Transboundary protected areas cooperation in the East Carpathian and Carpathian Biosphere Reserves. World Wide Fund for Nature, Vienna, Austria. 44 pp.
- Keeton, W.S.** 2005. Forest monitoring at the Marsh-Billings-Rockefeller National Historical Park, Research Report. U.S. Department of the Interior, National Park Service, Marsh-Billings-Rockefeller National Historical Park, Woodstock, VT. 77 pp.
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- Keeton, W.S.** and G.H. Aplet. 1997. Ecosystem management in the Interior Columbia River Basin. The Wilderness Society, Seattle, WA. 45 pp.
- Synge, H., **W.S. Keeton**, IUCN Commission on National Parks and Protected Areas (CNPPA), IUCN CNPPA Steering Committee, and IUCN Secretariat. 1996. A Regional Action Plan for Protected Areas in East Asia. IUCN Commission on National Parks and Protected Areas, East Asia. Gland, Switzerland. 78 pp.
- Nelson, C., J. Belsky, R. Brown, E. Frost, **W.S. Keeton**, P. Morrison, M. Scurlock, and G. Wooten. 1995. Key elements for ecological planning: management principles, recommendations, and guidelines for federal lands east of the Cascade Crest in Oregon and Washington, a report to the Interior Columbia Basin Ecosystem Management Project. Columbia River Bioregion Campaign, Walla Walla, Washington. 113 pp.

### *Conference Proceedings*

- Keeton, W.S.**, S. Burrascano, C. Pucko, C. Blasi, Y. Bihun, J. Chen, M. Chernyavskyy, B. Commarmot, J.F. Franklin, G. Gratzner, J.S. Nunery, Y. Shparyk, T.A. Spies, and M.E. Swanson. 2010. A global analysis of temperate old-growth forests: commonality in carbon storage and co-varying ecosystem functions. *International Forestry Review* 12(5):3.
- Keeton, W.S.**, P. Angelstam, M. Baumflek, Y. Bihun, M. Chernyavskyy, S. M. Crow, A. Deyneka, M. Elbakidze, J. Farley, V. Kovalyshyn, B. Mahura, S Myklush, J. R. Nunery, I. Solovity, and L. Zahvoyska. 2010. Sustainable forest management alternatives for the Carpathian Mountain region, with a focus on Ukraine. Page 89-90 in: K. Ostapowicz and J. Kozak (eds.). *Conference Proceedings of the Forum Carpathicum: Integrating Nature and Society Towards Sustainability*. Sept. 15-18, 2010, Krakow, Poland.
- Keeton, W.S.** 2007. Role of managed forestlands and models for sustainable forest management: perspectives from North America. Pages 73-87 in: Y. Tunytsya and I. Soloviy (eds.). *Proceedings of the international*

conference on a Global Environmental Convention. Ukrainian National Forestry University, Sept. 28-29, 2006, L'viv, Ukraine.

- Keeton, W.S.** and A. R. Troy. 2006. Balancing ecological and economic objectives while managing for late-successional forest structure. Pages 21-33 in: L. Zahoyka, editor. Ecologisation of economy as a key prerequisite for sustainable development. Proceedings of the international conference, Sept. 22 -23, 2005, Ukrainian National Forestry University, L'viv, Ukraine.
- Keeton, W.S.** 2005. Managing for old-growth structure in northern hardwood forests. Pages 6-11 in: K.P. Bennet (tech. ed.). Moving toward sustainable forestry: lessons from old-growth forests. Proceedings of the 6th eastern old-growth conference, Moultonborough, NH. University of New Hampshire Cooperative Extension Natural Resource Network Report.
- Keeton, W.S.**, C.E. Kraft, D.R. Warren, and A.A. Millward. 2005. Effects of old-growth riparian forests on Adirondack stream systems. Pages 39-43 in: K.P. Bennet (tech. ed.). Moving toward sustainable forestry: lessons from old-growth forests. Proceedings of the 6th eastern old-growth conference, Moultonborough, NH. University of New Hampshire Cooperative Extension Natural Resource Network Report.
- Keeton, W.S.**, A.M. Strong, D.R. Tobi, and S. Wilmot. 2001. Experimental test of structural complexity enhancement in northern hardwood-hemlock forests. Pages 33-40 in: J.M. Hagan (ed.). Forest Structure: A Multi-Layered Conversation. Proceedings of the Forest Information Exchange, Orono, Maine. Manomet Center for Conservation Sciences, Brunswick, ME.
- Mote, P.W., **W.S. Keeton**, J.F. Franklin. 1999. Decadal variations in forest fire activity in the Pacific Northwest. Pages 155-156 in: Proceedings of the 11th Conference on Applied Climatology, American Meteorological Society, Boston, MA.
- Keeton, W.S.** and W. Xianpu. 1993. An action plan for protected areas in East Asia. Pages 5-31 in: Proceedings of the 1st Conference on National Parks and Protected Areas of East Asia and 41th Working Session of the IUCN Commission on National Parks and Protected Areas, Beijing, China. Chinese Academy of Sciences, Beijing, China.

### *Online tools*

- Duncan, J. Pontius, G. Meigs, E.R. Tait, and **W.S. Keeton**. 2018. [Northern Forest Health Atlas](http://www.uvm.edu/femc/forest-health-atlas): An Online Disturbance Mapping Portal. Forest Ecosystem Monitoring Cooperative, Burlington, VT.  
[www.uvm.edu/femc/forest-health-atlas](http://www.uvm.edu/femc/forest-health-atlas)

## **GRANTS**

### 2020

- USDA McIntire-Stennis Forest Research Program. 2019-2024. Dynamic forest-stream interactions: experimental acceleration of late-successional stream functions and resistance to flood disturbance at the Hubbard Brook Experimental Forest, NH. W.S. Keeton (P.I.). \$446,997.
- National Science Foundation. 2020-2022. EAGER: Using Historic Art to Explore Legacies and Lost Function in Eastern US Forests. W.S. Keeton, P.I. on sub-award for \$16,394.
- U.S. State Department, Fulbright Scholars Program. W.S. Keeton (Awardee). Bridging the divide between European and North American perspectives on sustainable forest management. \$27,300.

### 2019

- Natural Resources Canada, 2019. Drivers and patterns of trait diversity in forests of eastern North America. W.S. Keeton (P.I.), Co-P.I.: Dominik Thom. \$7,500.

### 2018

- The Nature Conservancy, Natural Climate Solutions Accelerator Award, 2018-2019. Vermont forest carbon demonstration project: Phase II. N. Richardson and W.S. Keeton (Co-P.I.s). \$75,000 (\$20,000 sub-grant to UVM via Vermont Land Trust).

## 2017

Trust for Mutual Understanding, 2017-2020. Promoting Close-to-Nature-Silviculture in Hungary and Czech Republic to Achieve Ecosystem Service Benefits: a Tri-lateral Exchange of Ideas and Experience. W.S. Keeton (P.I.). Co-P.I.s: T. Standovar, R. Aszalos, L. Gálhidy, M. Svoboda, M. Mikola's. \$20,000.

High Meadows Foundation and Vermont Housing and Conservation Board. 2017-2018. Vermont Forest Carbon Feasibility and Demonstration Project. W.S. Keeton (P.I.), Co-P.I.: N. Richardson (Vermont Land Trust). \$50,000 total (\$20,000 to UVM).

## 2016

Northeastern States Research Cooperative. 2016-2018. Disturbance dynamics across the Northern Forest: Synthesizing NSRC studies using field and aerial assessments of ecosystem change within a regional forest health mapping framework portal. W. Keeton (P.I.), Co-P.I.s: J. Pontius, J. Duncan, G. Meigs. \$44,000.

## 2015

Northeastern States Research Cooperative. 2015-2018. Understanding Adoption of Sustainable Forest-Based Heating Alternatives for Northern Forest Homes and Communities. J. Short (P.I.), Co-P.I.s: D. Danks, W.S. Keeton, K. Wallin. \$115,070.

## 2014

USDA McIntire-Stennis Forest Research Program. 2014-2019. Managing the matrix: a framework for assessing ecosystem services in forested landscapes. W.S. Keeton (P.I.). Co-P.I.s: C. Danks, G. Galford, W. Kuentzel, J. O'Neil-Dunne, T. Ricketts, A. Strong, K. Wallin, D. Wang. \$958,000

Trust for Mutual Understanding, 2014-2016. Community-based forestry in Romanian: effects of land restitution on sustainable management. Trust for Mutual Understanding W.S. Keeton (P.I.). Co-P.I.: Robin Kemkes. \$20,000.

Burack Presidential Distinguished Lecture Series, University of Vermont. Appointment for Dr. Georg Gratzer, Austrian University of Life Sciences and Natural Resources (BOKU). 2014. W.S. Keeton awardee \$5,000.

## 2013

Northeastern States Research Cooperative. 2013-2016. Re-activation of the Vermont Forest Ecosystem Management Demonstration Project. W.S. Keeton (P.I.). \$72,000.

Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management. 2013-2016. Climate change adaptation potentials of forests in Bhutan – building human capacities and knowledge base. G. Gratzer (P.I.), Co-P.I.s: I. Ahmed, A. Darabant, D. Godbold, H. Hasenauer, R. Jandl, K. Katzensteiner, W.S. Keeton, M. Kleine, K. Michel, A. Schopf, K. Tenzin, and P. Wangda. \$1,485,000.

## 2012

USDA Forest Service McIntire-Stennis Forest Research Program. Reactivation of the Vermont Forest Ecosystem Management Demonstration Project. W.S. Keeton (P.I.). \$75,000.

Burack Presidential Distinguished Lecture Series, University of Vermont. Appointment for Dr. Patrick Hostert, Humboldt University of Berlin. 2012. W.S. Keeton awardee \$5,000.

## 2011

Northeastern States Research Cooperative. 2011-2014. Effects of long-term forest recovery pathways and management history on carbon sequestration and co-varying ecosystem services. W.S. (P.I.) \$72,223.

Trust for Mutual Understanding. 2011-2013. Capacity building for community-based forest carbon and bioenergy projects in western Ukraine. Keeton, W.S. (P.I.) and C. Danks (Co-PI). \$20,000.

## 2010

National Science Foundation. Award # 0613884. 2006-1010. The Northeastern Carbon Sink: Enhanced Growth, Regrowth or Both? W.S. Keeton (P.I.), J. C. Jenkins (Co-P.I; P.I. 2006-2009). \$51,000.

- Northeastern States Research Cooperative. 2010-2013. Evaluating supply and demand of northern forest branded carbon credits. Keeton, W.S. (PI), C. Danks (Co-PI). \$109,500.
- USDA Natural Resource Conservation Service, Conservation Innovation Grant. 2009-2011. Optimizing the greenhouse gas storage capacity and productivity of degraded forest lands: using rehabilitation forestry and carbon market participation to benefit overharvested forests in Vermont. L. Saligman (PI), W.S. Keeton, C. Danks, and B. Machin (Co-PIs). \$43,973.
- Northeastern States Research Cooperative. 2010-2013. Evaluating the influence of riparian forest structure on stream ecosystems across the northern forest. E. J. Rosi-Marshall (P.I.), W.S. Keeton, D. Warren, and J. J. Cole (Co-PIs). \$149,568.

#### 2009

- Trust for Mutual Understanding. 2009-2010. Promoting conservation of ecosystem services and biodiversity in the eastern Carpathians and the northeastern United States. M. Ceroni and W.S. Keeton (P.I.s). \$25,000.
- Northeastern States Research Cooperative. 2009-2012. Biomass fuel harvesting in the northern forest: effects on stand structural complexity and in-situ forest carbon storage. W.S. Keeton (P.I.); Co-P.I.: D.R. Tobi. \$92,056.

#### 2008

- U.S. Fulbright Specialist Program. Fall 2008. Fulbright visiting scholar at the Ukrainian National Forestry University, L'viv, Ukraine - \$7,000.
- The Nature Conservancy. 2008-2009. Effects of intermediate intensity wind disturbance on forest ecosystem dynamics – \$1,500. W. S. Keeton (P.I.).
- World Wide Fund for Nature. 2008. Protection and sustainable use of natural resources in the Ukrainian Carpathians: improving transboundary cooperation for protected areas management – \$20,000. Y. Bihun (P.I.); Co-P.I.s: O. Stankiewicz, W.S. Keeton, and M. Ceroni.
- USDA McIntire-Stennis Forest Research Program. 2008-2011. Evaluation of options for forestland owner participation in carbon markets: forest management alternatives and institutional and economic constraints– \$111,850. W. S. Keeton and Cecilia Danks (P.I.s).
- USDA McIntire-Stennis Forest Research Program. 2008-2010. Quantifying biological legacies as a component of bio-complexity: contrasting soil chemistry and site productivity. – \$36,000. Deane Wang (P.I.); Co-P.I.'s: G. Hawley, J. Hughes, W.S. Keeton, and C. Waite.

#### 2007

- Northeastern States Research Cooperative. 2007-2009. Quantification of long-term forest carbon dynamics and net carbon storage under alternate forest management scenarios in the northern forest region - \$50,000. W. S. Keeton (P.I.); Co-P.I.: J. Jenkins.
- Northeastern States Research Cooperative. 2007- 2010. Soil carbon and other quality indicators in managed northern forests. Donald Ross and Sandy Wilmot (P.I.'s); Co-P.I.'s: C. Alves, J. Briggs, D. Brynn, N. Kamman, W.S. Keeton, and T. Villars.

#### 2006

- Trust for Mutual Understanding, 2006-2008. Integrating ecological economics and sustainable forest management into Ukraine's transition economy: an international scientific exchange - \$25,000. W.S. Keeton (P.I.); Co-P.I.'s: D. Bergdahl, Y. Bihun, M. Chernyavskyy, R. Costanza, Joshua Farley, L. Maksymiv, S. Myklush, I. Soloviy, and L. Zahoyka.
- Northeastern States Research Cooperative, 2006-2007. Developing management guidelines for conserving late-successional forest in the Northern Forest region - \$177,000. J. M. Hagan (P.I.); Co-P.I.'s: W.S. Keeton (P.I. for \$20,000 sub-contract), G. McGee, and A. Whitman.
- The Vermont Monitoring Cooperative, 2006-2007. The Vermont Forest Ecosystem Management Demonstration Project - \$8,000. W.S. Keeton (P.I.).

#### 2005

- The Vermont Monitoring Cooperative, 2005-2006. The Vermont Forest Ecosystem Management Demonstration Project - \$8,000. W.S. Keeton (P.I.).
- Trust for Mutual Understanding, 2005-2006. The role of ecological economics and sustainable forest management in Ukraine's transition economy - \$30,000. Joshua Farley (P.I.); Co-P.I.'s: W.S. Keeton, D. Bergdahl, Y. Bihun, L. Maksymiv, I. Soloviy, and L. Zahoykska.

#### 2004

- Northeastern States Research Cooperative, 2004-2007. The Vermont Forest Ecosystem Management Demonstration Project - \$135,000. W. S. Keeton (P.I.); Co-P.I.'s: A. Strong, A. Troy, W. Kilpatrick, D. Tobi, and M. Skinner.
- Northeastern States Research Cooperative, 2004-2007. The influence of forest attributes on umbrella species and indicators of biodiversity: Establishing guidelines for sustainable forest management - \$138,786. T. Donovan (P.I.); Co-P.I.'s: W.S. Keeton, and T. McEvoy.
- USDA McIntire-Stennis Forest Research Program, 2004-2008. Effects of old-growth riparian forests on Adirondack stream systems: implications for restoration and watershed management - \$53, 000. W. S. Keeton (P.I.); C. Kraft, Cornell University (Cooperator).

#### 2003

- Northeastern States Research Cooperative, 2003-2006. Eco-cruise: Developing a reliable, rapid assessment protocol for sustainable forestry on non-industrial private forest lands - \$75,460. D. Wang (P.I.); Co-P.I.'s: B. Foster, W.S. Keeton, C. Danks, and T. McEvoy.
- USDA McIntire-Stennis Forest Research Program, 2003-2006. Land-use change in northern forests: assessing the influence of localized forest structure and composition on wildlife community composition and diversity - \$79,173. W.S. Keeton (P.I.); T. Donovan (Cooperator).
- USDA McIntire-Stennis Forest Research Program, 2003-2005. Land use change in Vermont: assessing impacts to biodiversity, 2 year post-doc proposal - \$64,000. P.I.'s (listed alphabetically): T. Donovan, W. S. Keeton, A. Troy, A. Vionov.
- U.S. Fish and Wildlife Service, Partners for Wildlife Program, 2003-2005. Evaluation of tree mortality factors in riparian forest restoration. \$2,000 used for ENSC 201 (Restoration Ecology) class experiment. W.S. Keeton (P.I.).
- Hardwood Forestry Fund, 2003. Aiken Center forest restoration/tree planting demonstration. \$1000. W.S. Keeton (P.I.).

#### 2002

- USDA Cooperative State Research, Education, and Extension Service; National Research Initiative, 2002-2004. Structural complexity enhancement in northern hardwood-hemlock forests and effects on avian and invertebrate diversity - \$75,000. W.S. Keeton (P.I.); Co-P.I.'s: A. Strong, D. Tobi, and M. Skinner.
- U.S. Environmental Protection Agency, STAR program, 2002-2005. Linking land-use change, stream geomorphology, and aquatic biodiversity in a hierarchical classification scheme - \$664,339. M. Watzin (P.I.); Co-P.I.'s: C. Hession, W.S. Keeton, and A. Troy.
- Northeastern States Research Cooperative, 2002-2005. Linking land-use change, stream geomorphology, and aquatic integrity in changing forested landscapes - \$212,715. M. Watzin (P.I.); Co-P.I.'s: C. Hession, A. Troy, and W.S. Keeton.
- Vermont Monitoring Cooperative, 2002-2005. Appointment as Director of the Vermont Forest Ecosystem Management Demonstration Project - \$ 51,000. W.S. Keeton (P.I.).

#### 2001

- USDI National Park Service, 2001-2004. Long-term forest dynamics monitoring at the Marsh-Billings-Rockefeller National Historical Park - \$101,000. W.S. Keeton (P.I.).
- USDA McIntire-Stennis Forest Research Program, 2001-2006. Accelerating late-successional stand development in northern hardwood-hemlock forests: development and test of a restorative silvicultural system - \$82,500. W.S. Keeton (P.I.).

## **ADDITIONAL SERVICE**

### Committee Appointments:

- Gund Institute for Environment, Fellows Nominating and Review Committee (2016 to 2019)
- Vermont State Legislature, Act 250 Legislative Advisory Committee (2017 to 2019)
- Rubenstein School Liaison to the Hubbard Brook Research Consortium (2018 to present)

### Elected Committees:

- RSENR Faculty Standards Committee (2018-present, Chair 2019-2020)
- RSENR Graduate Standards Committee (2016-2018)
- University Professional Standards Committee (2013-2016)
- University Faculty Senate Committee on Curricular Affairs (2009-2012)
- Academic review committee for UVM Integrated Biology Program (2009-2010)
- University Faculty Senate Committee on Finances and Physical Planning (2006-2009)
- Rubenstein School Core Curriculum Committee (2011-present)
- Rubenstein School Graduate Standards Committee (2004-2005)
- Rubenstein School Honors and Studies Committee (2001-2004; Chair, 2003-2004)

### Search Committee Appointments:

- Applied Forest Scientist Professor (2013-2014), Committee Chair
- Extension Forestry Professor (2012)
- Climate Scientist (2011)
- Climate Scientist (2008)
- Climate Scientist (2006)
- Sustainable Forestry Education Coordinator (2005)

### Ad Hoc Committees:

- Jericho Research Forest Advisory Committee (2011-2015)
- UVM Landscaping Committee (2009)
- Conservation Seminar Series Organizing Committee (2007)
- Green Forestry Initiative Advisory Committee (2005-2014)
- Committee on creation of a joint forestry/wildlife biology major (2004-2005)
- School Lands Committee (2001-2015)
- Rubenstein School Diversity Workshop (January 2005)
- Core Curriculum Committees (2001-2010; 2015-present)

### Student Clubs:

- UVM Forestry Club, Faculty Advisor (2010-2015)
- UVM Women's Soccer Club, Faculty Advisor (2020-present)

### Journal Peer Review:

- Bioscience
- Canadian Journal of Forest Research
- Climatic Change
- Conservation Ecology
- Ecology
- Ecological Applications
- Ecological Monographs
- Ecosphere
- Environmental Management

- Ecosystems
- European Journal of Forest Research
- Forest Ecology and Management
- Forest Science
- Forests
- GeoReview
- Global Change Biology
- Journal of Applied Ecology
- Landscape Ecology
- Mountain Research and Development
- Nature Sustainability
- Northwest Science
- Proceedings of the National Academy of Sciences
- Regional Environmental Change
- Restoration Ecology
- Science of the Total Environment
- Torrey Botanical Society

Grant Program Peer Review:

- National Science Foundation
- Northeastern States Research Cooperative
- USDA Forest Service, McIntire-Stennis Forest Research Program
- Deutsche Forschungsgemeinschaft -- German Research Foundation

Guest Associate Editor, Journal Special Issues:

- Mountain Research and Development (2016-2017). Co-editor. [Special issue](#) on mountain forests and the United Nations' Sustainable Development Goals.
- Science of the Total Environment (2017). Co-editor. [Special issue](#) for the proceedings of the 2016 Forum Carpaticum International Conference.
- Forests (2018). Co-editor. [Special issue](#) on old-growth temperate and boreal old-growth forests: processes, functions, and dynamics.

Additional Peer Review:

- Elsevier Sciences
- Springer-Verlag
- MIT Press
- U.S. State Department. Fulbright Scholars Program
- USDI National Park Service, Inventory and Monitoring Program, Northeast Temperate Network
- Marsh-Billings-Rockefeller National Historical Park, Silvicultural Inventory System
- United Kingdom Ministry of Environment, Bioenergy Study
- USDA Forest Service Draft Environmental Impact Statement for National Forest System Land Management
- National Wildlife Federation, Fire Management Report
- Belgian Earth Observatory Program
- Forest Stewardship Guild
- External tenure reviewer for University of New Mexico, Utah State University, Colorado State University
- Dissertation reviewer: Austrian University of Natural Resources and Life Sciences, Humboldt University of Berlin, and University of Quebec-Montreal

## **PROFESSIONAL MEMBERSHIPS**

Forest Guild (professional member)  
Ecological Society of America

Society of American Foresters

## **GRADUATE STUDENTS**

### *Post-Doctoral Researchers*

Dr. Dominik Thom (Sept. 2017–2019). Research topic: Managing the matrix: a framework for assessing ecosystem services in forested landscapes. Also: Modeling forest ecosystem change at the boreal – temperate ecotone.

Dr. Garrett Meigs (2014-2017). Research topic: Managing the matrix: a framework for assessing ecosystem services in forested landscapes. Also: Effects of intermediate intensity wind disturbance in northern forests.

Dr. Thomas Buchholz (2009-2011). Research topic: Economic feasibility of small-scale bioenergy applications in the northern forest region. Funded by the National Science Foundation.

Dr. Sabina Burrascano (Fall 2009). Research topic: Global meta-analysis of temperate old-growth forests. Funded as a visiting scholar from the Plant Biology Department, University of Rome – La Sapienza, Rome, Italy.

### *Current Graduate Students*

Stephen Peters-Collaer. Candidate for Doctor of Philosophy. Dissertation topic: Experimental acceleration of late-successional forest-stream interactions at the Hubbard Brook Experimental Forest, NH.

Liam Farley. Candidate for M.S. in Forestry. Thesis topic: Biological control of invasive hemlock woolly adelgid (*Adelges tsugae*). Major advisor.

Hanna Kirchmeir. Candidate for Master of Science in Conservation Science. University of Vienna, Austria. W.S. Keeton Major Supervisor. Thesis topic: Forest-stream interactions at the Hubbard Brook Experimental Forest, New Hampshire. Major advisor

Jon Urgoiti Otazua. Candidate for Doctor of Philosophy, University of Quebec at Montreal. Dissertation topic: Stand development processes affected by compositional and structural neighborhood effects. Co-major advisor.

### *Former Graduate Students*

Bradley Materick. M.S. Botany, 2005. Project topic: Soil impacts from low intensity, uneven-aged silvicultural practices in northern hardwood forests.

Heather McKenny. M.S. Forestry, 2005. Thesis topic: Effects of structure-based forestry practices on amphibians in northern hardwood forests.

Erin Copeland. M.S. Forestry, 2006. Thesis topic: The riverine corridor as a mosaic of patches: riparian vegetation structure, classification, and geomorphological links, Champlain Basin, Vermont, USA.



- Katie Manaras. M.S. Forestry, 2006. Thesis topic: Influence of forest structure and sampling scale on predictive accuracy in modeling avian community composition.
- Laurel Williams. M.S. Forestry, 2006. Thesis topic: Predicting stand development responses to structural complexity enhancement in northern hardwood forests, using the SORTIE model and the "Structural Complexity Index."
- Kimberly Smith. M.S. Forestry, 2007. Thesis topic: Effects of low-intensity, uneven-aged silvicultural practices on understory plant communities in northern hardwood forests.
- Jeremy Stovall. M.S. Forestry, 2007. Thesis topic: Canopy structure and light environment over low-order streams, and effects on in-stream primary productivity, in mature and old-growth riparian northern hardwood-conifer forests, Adirondack Mountains, NY.
- Miranda Curzon. M.S. Forestry, 2008. Thesis topic: Canopy gap dynamics and spatial distribution in old-growth riparian northern hardwood-conifer forests, Adirondack Mountains, NY.
- Bryan Foster (Co-advised with Dr. Deane Wang), 2008. Ph.D Natural Resources. Dissertation topic: Sustainable forest management and certification systems in northern New England: ecological and economic implications.
- Jared Nunery. M.S.Forestry, 2009. Thesis topic: Forest carbon storage in the northeastern United States: effects of harvesting frequency and intensity including wood products.
- Dima Karabchuk. Visiting Fulbright Doctoral Scholar (2011-2012). Topics: 1) Capacity building for carbon project development in western Ukraine; and 2) Effects of long-term forest recovery pathways and management history on carbon sequestration and co-varying ecosystem services
- Caitlin Littlefield. 2012. M.S. Thesis topic: Effects of biomass fuel harvesting on stand structure and carbon storage in northern hardwood forests.
- Anna Mika. Ph.D. 2013. Natural Resources. Dissertion topic: Carbon footprint analysis in urban and forested landscapes of northern New England.
- Emily Russell-Roy, 2013. M.S Forestry. Thesis topic: Optimizing the greenhouse gas storage capacity and productivity of degraded forest lands: using rehabilitation forestry and carbon market participation to benefit overharvested forests in Vermont. Co-advised with Dr. Jennifer Pontius.
- Amanda Egan, 2013. M.S. Forestry. Thesis topic: Capacity building for carbon project development in western Ukraine. Co-advised with Dr. Cecilia Danks.
- Charles Kerchner. Ph.D., 2013. Natural Resources. Dissertation topic: Potential for forest carbon project development in the northern forest region.
- Jakob Schenker. 2014 M.S. EcoDesign. Thesis topic: bioremediation of contaminated wastewater using fungi microcosms.
- Sarah Ford, M.S.Forestry, 2015. Thesis topic: Carbon dynamics associated with structural complexity enhancement in northern hardwood forests

Andrea Urbano, M.S. Forestry, 2015. Thesis topic: Effects of long-term forest recovery pathways and management history on carbon sequestration and co-varying ecosystem services.

Choki Gyeltshen. M.S. in Mountain Forestry at BOKU, Vienna, Austria. 2016. W. Keeton served as major adviser through a joint agreement. Mr. Gyeltshen spent Oct 2015 – Feb 2016 at UVM. Thesis topic: Forest fire-climate relationships in Himalayan blue pine forests: developing a predictive model for the future.

Aviva Gottesman. M.S. Forestry. 2016. Thesis topic: Tree regeneration dynamics and controls in response to structural complexity enhancement

Lena Vilà Vilardell. M.S. in Mountain Forestry. 2019. University of Natural Resources and Life Sciences, Vienna, Austria. W.S. Keeton Major Supervisor. Thesis topic: Development of a fire risk model for Himalayan blue pine forests in Bhutan.

## PRESENTATIONS

### *Invited*

#### 2020

Keeton, W.S. Forest carbon and achieving Vermont's climate goals. Webinar organized by the Sierra Club of Vermont. Sept. 23, 2020.

Keeton, W.S. and N. Richardson. Vermont forest carbon feasibility study. Vermont Forest Carbon Stakeholders Meeting, conducted remotely August 27, 2020.

Barton, A.M. and W.S. Keeton. Ecology and recovery of eastern old-growth forests. Interview and podcast for New Books Network, available [here](#). May 7, 2020.

Keeton, W.S. Climate friendly forests, an evening with Bill Keeton. Special event organized by Vermont Family Forests, Vermont Land Trust, Vermont Audubon, and Vermont Natural Resources Council. Middlebury, VT, Feb. 27, 2020

Keeton, W.S. Climate friendly forests: managing forests for carbon and co-benefits. Invited seminar. Cary Institute of Ecosystem Studies, Millbrook, NY, Feb. 13, 2020.

#### 2019

Keeton, W.S. Eastern old-growth forests: management, restoration, and adaptation. Featured speaker, Northern Woodlands Conference, Fairlee, VT., Oct. 18-20, 2019

Keeton, W.S. Climate friendly forests. Invited Seward Weber Lecture, Montpelier, VT. Sept. 26, 2019.

Keeton, W.S. Forest carbon project feasibility in the Northeast: how to achieve multiple co-benefits. Vermont Agency of Natural Resources, Department of Forests, Parks, and Recreation. Montpelier, VT. July 24, 2019

Keeton, W.S. Forest carbon projects in the Northeast: science, benefits, and market opportunities. Vermont Agency of Natural Resources, Department of Forests, Parks, and Recreation. Montpelier, VT. July 24, 2019

Keeton, W.S. Disturbance-based forestry for biodiversity, ecosystem services, and climate adaptation. Workshop taught at the Czech University of Life Sciences, Prague, Czech Republic, May 30, 2019.

Keeton, W.S. Forest ecosystem dynamics in the Northern Forest Region. Dartmouth College, Hanover, NH, May 7, 2019.

Keeton, W.S. Responding to global change: sustainable forest management for adaptation and mitigation in the U.S. Northeast. Invited Keynote Presentation to Carrefour Forêts. Quebec City, Quebec, Canada. April 3, 2019.

Keeton, W.S. Forest carbon project feasibility for private landowners: financial viability and spatially explicit co-benefits. New England Society of American Foresters Annual Conference, Burlington, VT, March 27-29, 2019.

Keeton, W.S. Ecology and recovery of eastern old-growth forests. Hardy Plant Club, Montpelier, VT. March 23, 2019.

- Keeton, W.S. Ideas to tackle climate change before it's too late. Connecticut National Public Radio, "Where we live." March 22, 2019. [Link](#)
- Keeton, W.S. The Role of Vermont's Forests in Climate Action -- Heating and Sequestering. Invited panel discussion at Vermont Climate and Energy Action Network annual conference, Fairlee, VT, Dec. 9, 2019.

## 2018

- Keeton, W.S. Vermont's Role in Carbon Storage and the Emerging Carbon Markets. Vermont Public Radio. Aug. 22, 2018. [Link](#)
- Keeton, W.S. Forest-stream interactions in old-growth northeastern forests: recovery of stream habitats and implications for flood resilience. New England Natural History Conference, April 13-15, 2018, Burlington, VT.
- Keeton, W.S. Keynote presentation: Forest carbon baselines and management scenarios: incorporating climate change and disturbance. Workshop on carbon modeling in primary and old-growth forest systems. E.C.O. Institute, Klagenfurt, Austria, June 7, 2018.
- Keeton, W.S. Opportunities for improved forest management and carbon projects in the U.S. Northeast. Sustainability Seminar Series, Marsh-Billings-Rockefeller National Historical Park, June 16, 2018, Woodstock, VT
- Keeton, W.S. Forest carbon management in the Northeast: how to achieve multiple co-benefits. Craftsbury Nordic Center Seminar Series, Craftsbury, VT., June 21, 2018.
- Keeton, W.S. Dynamic forest-stream interactions: experimental acceleration of linkages conferring late-successional stream functions and resistance to flood disturbance. Hubbard Brook Cooperators Meeting, Hubbard Brook Experimental Forest, NH, July 11-12, 2018.
- Keeton, W.S. Vermont forest carbon: an opportunity for forest landowners. A presentation to the Cold Hollow to Canada initiative. Montgomery, VT., Sept. 11, 2018.
- Keeton, W.S. Dynamic forest-stream interactions: experimental acceleration of late-successional stream functions and resistance to flood disturbance. Cary Institute for Ecosystem Science, Milbrook, N.Y. October 10, 2018.
- Keeton, W.S. Disturbance-based management for old-growth characteristics and late-successional functions in mesic temperate forests. Forum Carpathicum, Oct. 15-18, 2018, Eger, Hungary
- Keeton, W.S. New theories in silviculture: plenary roundtable discussion. 4<sup>th</sup> National Congress of Silviculture, Nov. 5-9, Turin, Italy.
- Keeton, W.S. Ecology and recovery of eastern old-growth forests: a book release. Marsh-Billings-Rockefeller National Historical Park, and Sustainable Woodstock, Nov. 14, 2018, Woodstock, VT
- Keeton, W.S. Vermont forest carbon feasibility study. Invited presentation to the Vermont Roundtable on Forest Parcelization and Sprawl, December 18, 2018, Randolph, VT.

## 2017

- Keeton, W.S. Vermont researchers speed up tree aging process to create old growth. National Public Radio, *Here and Now*. [Link](#)
- Keeton, W.S. and S.E. Ford. Enhanced carbon storage and co-benefits through management for structural complexity and old-growth characteristics in northern hardwood-conifer forests of North America. International Union of Forest Research Organizations (IUFRO), 125<sup>th</sup> Anniversary Congress, Freiburg, Germany. Sept. 18-22, 2017.
- Keeton, W.S. and G. W. Meigs. Intermediate severity windthrow effects on forest structure and carbon dynamics in the eastern United States: implications for adaptive management. International Union of Forest Research Organizations (IUFRO), 125<sup>th</sup> Anniversary Congress, Freiburg, Germany. Sept. 18-22, 2017.
- Keeton, W.S. Forests, carbon and climate resilience: approaches for woodland management. Working Woodlands Series, Marsh-Billings-Rockefeller National Historical Park, Woodstock, VT. August 27, 2017.
- Keeton, W.S. Experimental tests of silvicultural strategies that promote stand structural complexity in northern hardwood forests. North American Forest Ecology Workshop. Edmonton, Alberta, Canada, June 19-22, 2017.

- Keeton, W.S. Forest carbon project feasibility in the Northeast: how to achieve multiple co-benefits. Managing Our Forests Webinar Series, Vermont Dept. of Forests, Parks, and Recreation. Dec. 5, 2017. [https://www.youtube.com/watch?v=Ow\\_WztLulMI](https://www.youtube.com/watch?v=Ow_WztLulMI)
- Keeton, W.S. Sustainable forest management based on disturbance-based silviculture. Frelighsburg, Quebec, Canada, August, 2017.
- Keeton, W.S. A North American perspective on disturbance-based forest management. Hungarian Academy of Sciences, Centre for Ecological Research. Budapest, Hungary, March 16, 2017.
- Keeton, W.S. Management for old-growth characteristics and late-successional biodiversity in temperate montane forests. Hungarian Academy of Sciences, Centre for Ecological Research. Budapest, Hungary, March 16, 2017.
- Keeton, W.S. Forest carbon management in the U.S. Northeast. Northeastern Ecosystem Research Cooperative Conference. Saratoga Springs, March 29, 2017.

## 2016

- Keeton, W.S., Garrett Meigs, Sabina Burrascano, Yuriy Bihun, Carlo Blasi, Jiquan Chen, Mykola Chernyavskyy, Dmytro Karabchuk, Brigitte Commarmot, Jerry F. Franklin, Georg Gratzler, Thomas Spies, Mark E. Swanson, Grant Wardell-Johnson, Christopher Dean, Miroslav Svoboda, Volodymyr Trotsiuk, Magdalena Main-Knorn, Christine Goodale, Gregory McGee, Jonathon Thompson, Andrew Whitman. Carpathian Old-growth Forests in a Global Context: Shared Form and Function or Regional Distinctiveness? Keynote Presentation at the Forum Carpaticum. Bucharest, Romania, Sept 28-30, 2016.
- Keeton, W.S. Importance of global old-growth forest conservation. Invited presentation to the Carpathian Convention Secretariat and Working Group on Forests. Brasov, Romania, Sept. 26, 2016.
- Keeton, W.S. G. Meigs et al. Sabina Burrascano, Yuriy Bihun, Carlo Blasi, Jiquan Chen, Mykola Chernyavskyy, Dmytro Karabchuk, Brigitte Commarmot, Jerry F. Franklin, Georg Gratzler, Thomas Spies, Mark E. Swanson, Grant Wardell-Johnson, Christopher Dean, Miroslav Svoboda, Volodymyr Trotsiuk, Magdalena Main-Knorn, Christine Goodale, Gregory McGee, Jonathon Thompson, Andrew Whitman. A global analysis of temperate old-growth forests: Universal Ecosystem Services and Conservation Imperative. Invited seminar at Eötvös Loránd University. Budapest, Hungary. March 10, 2016.
- Keeton, W.S. G. Meigs, Sabina Burrascano, Yuriy Bihun, Carlo Blasi, Jiquan Chen, Mykola Chernyavskyy, Dmytro Karabchuk, Brigitte Commarmot, Jerry F. Franklin, Georg Gratzler, Thomas Spies, Mark E. Swanson, Grant Wardell-Johnson, Christopher Dean, Miroslav Svoboda, Volodymyr Trotsiuk, Magdalena Main-Knorn, Christine Goodale, Gregory McGee, Jonathon Thompson, Andrew Whitman. A global analysis of temperate old-growth forests. Invited seminar for the Gund Institute for Ecological Economics. Burlington, VT, Feb 19, 2016.
- Keeton, W.S. Opportunities for carbon market participation in the U.S. Northeast. Annual Meeting of COVERTS. Randolph, Vermont. October 10, 2016.
- Meigs GW, Bailey JD, Campbell JL, Keeton WS, Kennedy RE, Zald HSJ. Forest disturbance interactions: Do insect outbreaks tax or subsidize the activity of subsequent wildfires? Harvard Forest Seminar. April 2016, Petersham, MA.

## 2015

- Meigs GW, Bailey JD, Campbell JL, Keeton WS, Kennedy RE, Zald HSJ. November 2015. Does wildfire likelihood or severity increase following insect outbreaks in conifer forests of the Pacific Northwest? Northwest Fire Science Consortium webinar series. <https://youtu.be/kjkelCN4Zck>
- Keeton, W.S. Management for old-growth characteristics and late-successional biodiversity in temperate montane forests. Vermont Monitoring Cooperative Annual Meeting. Burlington, VT, December 11, 2015.
- Keeton, W.S. Management for old-growth characteristics and late-successional biodiversity in temperate montane forests. Mountains of our Future Earth. Perth, Scotland, UK October 4-8, 2015.
- Keeton, W.S. Broadening the options for sustainable forestry: emulating natural disturbances and managing for old-growth characteristics. Wood at Work. Bronx Zoo – Wildlife Conservation International, New York, NY. Oct 30, 2015.

- Keeton, W.S. and C. Gyeltshen. Adapting to Forest fires and Climate Change in Bhutan's Blue Pine Forests. Ministry of Agriculture and Forests, Thimphu, Bhutan, August 2015.
- Keeton, W.S. Opportunities for forest carbon projects in Vermont. Invited testimony to the Vermont State Legislature, House Committee on Natural Resources and Energy. Montpelier, VT, April 30, 2015.
- Keeton, W.S. Managing northeastern forests for flood resilience in the face of climate change. Invited speaker, New England Society of American Forests annual conference. Fairlee, VT, March 24-27, 2015.

#### 2014

- Keeton, W.S. We can make forest carbon projects work in Vermont. Invited presentation to the Vermont Forest Roundtable. Randolph, VT, Dec. 18, 2014.
- Keeton, W.S. UVM's research forests: proving grounds for ecosystem sustainability. Natural Areas Symposium. Burlington, VT, Nov. 11, 2014.
- Keeton, W.S. Opportunities for northeastern landowner participation in forest carbon markets. Webinar conducted for the Northeastern States Research Cooperative, October 22, 2014
- Keeton, W.S. Keeton, W.S. We can make forest carbon projects can work in Vermont! Gund Research Slam. Gund Institute for Ecological Economics, Burlington, Vermont. Nov. 20, 2014.
- Keeton, W.S., J.R. Nunery, E. Russell-Roy, and C.D. Kerchner. Exploring the potential for forest carbon management in northeastern forests: a research synthesis. Invited presentation. Vermont Agency of Natural Resources, Northeastern States Research Cooperative speaker series. Montpelier, VT, May 15, 2014.
- Keeton, W.S. Forestry practices for climate change adaptation in northern hardwood forests. Invited speaker. Forest Guild National Meeting. Burlington, VT. June 19, 2014.

#### 2013

- Keeton, W.S. Fighting climate change and conserving the great forest of the Carpathian Mountain Region, Europe. Trust for Mutual Understanding, New York, NY. Dec. 16, 2013
- Keeton, W.S. Toward a unified vision of forest carbon management. Invited Keynote. International Scientific Conference on Earth Bioresources and Environmental Biosafety: Challenges and Opportunities. Kiev, Ukraine. Nov. 4-7, 2013.
- Keeton, W.S. Forest-stream interactions in late-successional systems: a guide for restoration. Invited session presentation. International Scientific Conference on Earth Bioresources and Environmental Biosafety: Challenges and Opportunities. Kiev, Ukraine. Nov. 4-7, 2013.
- Keeton, W.S. Forest ecosystem services as a dynamic system. Gund Research Slam. Gund Institute for Ecological Economics, Burlington, Vermont. Oct. 29, 2013.
- Keeton, W.S.. Cross-regional perspectives on ecosystem management in temperate forest systems. Invited plenary presentation. 92nd Congress of Quebec Forest Engineers, Gatineau, Quebec, Canada. Sept. 11, 2013.
- Keeton, W.S.. Forest-stream interactions in temperate forest systems. Invited seminar. Institute for Forest Ecology, Austrian University of Natural Resources and Life Sciences (BOKU), Vienna, Austria. February 27, 2013.
- Keeton, W.S., S.E. Ford, N.C. Dove, K.J. Smith, and H.C. McKenny. Experimental gaps in the Vermont Forest Ecosystem Management Demonstration Project: effects on stand dynamics, salamanders, understory plants, and fungi. Invited presentation/organized session. Ecological Society of America Annual Conference, Minneapolis, MN. August 11, 2013.
- Keeton, W.S. Forest carbon management in temperate forest systems. Invited seminar. Gregor Mendel University, Brno. Czech Republic. May 9, 2013.
- Keeton, W.S. Natural disturbance-based forestry for economic and ecological objectives: lessons from research in North America. Invited seminar. Czech National Agricultural Academy, Prague, Czech Republic. March 14, 2013.
- Keeton, W.S. Forest management planning for carbon and multiple co-benefits. Invited Keynote. Polish Winter Forestry School, Warsaw, Poland. March 21, 2013.
- Keeton, W.S., D. Foster et al. (18 co-authors). Wildlands and woodlands: A vision for the New England landscape based on investigations of long-term land-use change. Invited Keynote. Forest cover changes in

mountainous regions ? drivers, trajectories and implications, Opening Conference. Jagiellonian University, Krakow, Poland, March 8, 2013.

Keeton, W.S. Towards a holistic forest carbon management approach. Invited seminar. Gund Institute for Ecological Economics, University of Vermont, Burlington, VT. Jan. 25, 2013.

Keeton, W.S., J.R. Nunery, E. Russell-Roy, and C.D. Kerchner. Exploring the potential for forest carbon management in northeastern forests: a research synthesis. Invited presentation. New England Society of American Forests Annual Conference, Saratoga Springs, NY. Jan. 31, 2013.

## 2012.

Keeton, W.S. Holistic forest carbon management. Polish Agricultural Academy. Krakow, Poland, Dec. 13, 2012.

Keeton, W.S. Forest stream interactions in temperate forest ecosystems, a research synthesis. Polish Teaching Academy, Krakow, Poland, Dec. 14 2012.

Keeton, W.S. Toward a unified theory of forest carbon management. Middlebury College, Environmental Colloquium, Middlebury, VT. Oct 11., 2012.

Keeton, W.S., C.E. Kraft, D.R. Warren, M.T. Curzon, and J. P. Stovall. A reexamination of biomass dynamics and riparian functions in late-successional forests of the northeastern U.S.. Invited special symposium in honor of Dr. Jerry Franklin. Ecological Society of America Annual Conference, Portland, OR, August 2012

Keeton, W.S. Toward a holistic approach to forest carbon management. University of Wisconsin-Madison, Department of Forest Ecology and Wildlife, Madison, Wisconsin. March 23, 2012

Keeton, W.S. Bioenergy harvesting impacts on stand structure and carbon fluxes based on field data. Symposium on Long Term Ecological Research. Harvard University, Harvard Forest. Petersham, MA. March 20, 201.

Keeton, W.S. Biomass dynamics in late-successional forests, implications for carbon management. University of Quebec-Montreal, Biology Department. Montreal, Quebec, Canada. March 14, 2012.

## 2011

Keeton, W.S. Toward a unified theory of forest carbon management. Cornell University, Division of Neurobiology and Behavior. Ithaca, New York. September 16, 2011

Keeton, W.S. Effects of bioenergy harvesting on stand structure and carbon fluxes in northern hardwood forests based on field data. Invited presentation to the annual meeting of the Hubbard Brook Committee of Scientists, Cary Institute of Ecosystem Studies, Milbrook, NY, October 5, 2011.

Keeton, W.S. Sustainable forest management in western Ukraine. Invited presentation at the Symposium on Diverse Landscapes of Ukraine: A Celebration of Twenty Years of Independence. Pennsylvania State University, University Park, PA, September 30, 2011

Keeton, W.S. Sustainable forestry research at the UVM Jericho Research Forest. Invited field presentation, Annual Conference of the Association for Environmental Studies and Sciences, Burlington, VT., June 26, 2011.

Keeton, W.S. Opportunities for Collaborative Research on Sustainable Forest Management. Invited presentation to Science for the Carpathians (S4C), Annual Meeting in conjunction with Carpathian Convention Third Conference of the Parties. Bratislava, Slovakia, May 27, 2011.

Keeton, W.S. Effects of biomass energy harvesting on stand structure and carbon fluxes in northern hardwood forests. Invited presentation to the Biomass Energy Working Group, Vermont State Legislature. Montpelier, VT. May 17, 2011.

Keeton, W.S. Invited panelist, Ecosystem Services Group. Northern Forest Summit. Whitefield, NH, May 4-5, 2011.

Keeton, W.S. Wood Biomass Energy: Looking Back, Moving Forward. Invited Keynote presentation to UVM Bioenergy Research Symposium. Burlington, VT, April 28, 2011.

Keeton, W.S. Toward a Unified Theory of Forest Carbon Management. Invited presentation to the RSENR Graduate Seminar Series. Burlington, VT, March 17, 2011.

Keeton, W.S. Ecologically Oriented Sugarbush Management. Invited presentation to Northeast Organic Farm Association, Winter Conference. Burlington, VT, Feb. 13, 2011.

- Buchholz, T. and W.S. Keeton. Bioenergy From Forests: The Debate on Carbon Accounting. Invited seminar presented to Dartmouth College, Environmental Studies Program, Hanover NH, February 7, 2011.
- Keeton, W.S., A. Mika, C. Littlefield, and T. Buchholz. Invited presentation. Fuel from the Forest: Land, Climate, and Energy Implications of Woody Biomass. Yale University, School of Forestry and Environmental Studies. Jan 11, 2011, New Haven, CT.
- Keeton, W.S. Toward a Unified Theory of Forest Carbon Management. Invited presentation to the Society of American Foresters, Green Mountain Division Annual Meeting. Montpelier, VT. 2011.

## 2010

- Keeton, W.S. Forest cover declines in New England. Vermont Public Radio. May 10, 2010. [Link](#)
- Keeton, W.S. Towards a unified theory of forest carbon management. Invited presentation to the Belgian Earth Observatory Program, Department of Earth and Environmental Sciences, Leuven Catholic University, Leuven, Belgium. December 12, 2010.
- Keeton, W.S. Towards a unified theory of forest carbon management. Invited presentation to the Yale Forest Forum, Yale University, School of Forestry and Environmental Studies. New Haven, CT. November 4, 2010.
- Buchholz, T. and W.S. Keeton. Forest Carbon Cycle. Sustainable Use of Renewable Energy (SURE): Renewable Technologies and Carbon Cycling State University of New York, College of Environmental Science and Forestry (SUNY-ESF), Syracuse NY November 4, 2010.
- Keeton, W.S. Towards a unified theory of forest carbon management. Invited Keynote presentation to the Eastern Canada/U.S.A Forest Science Conference (ECANUSA). Edmunston, New Brunswick, Canada. October 14, 2010.
- Keeton, W.S., S. Burrascano, C. Pucko, C. Blasi, Y. Bihun, J. Chen, M. Chernyavskyy, B. Commarmot, J.F. Franklin, G. Gratzer, J.S. Nunery, Y. Shparyk, T.A. Spies, and M.E. Swanson. 2010. A global analysis of temperate old-growth forests: commonality in carbon storage and co-varying ecosystem functions. Invited Sub-Plenary talk, IUFRO World Congress, August 23-28, Seoul, Korea.
- Keeton, W.S. Old-growth forest effects on Adirondack streams: a research synthesis. Quebec/Ontario Forest Management Study Group, Paul Smiths College, Saranac Lake, New York. July 2010.
- Keeton, W.S. Managing northern forests for carbon and environmental co-benefits. Invited presentation to the Northeastern States Research Cooperative, Burlington, VT. May 19, 2010.
- Keeton, W.S. Enhancing forest carbon storage in northern New England. Invited seminar, Bennington College, Bennington, VT. April 10, 2010.
- Keeton, W.S. Biomass development in late-successional forests. Invited presentations at Paul Smith's College, Saranac Lake, New York. April 2010.
- Keeton, W.S. Sustainable forest management and carbon markets. Invited seminar at the Institute of Ecological Economics, Ukrainian National Forestry University, L'viv, Ukraine. March 10, 2010.

## 2009

- Keeton, W.S. Forest carbon management alternatives for the northern forest. Vermont Land Trust board meeting. Dec. 11, 2009, Burlington, VT.
- Keeton, W.S., C. Kraft, J. Stovall, M. Curzon, D.R. Warren, and J. Nunery. Forest-stream interactions in the Northeastern U.S.: a synthesis of seven years of research. UVM Water Resources Research Seminar. Dec. 1. 2009. Burlington, VT.
- Keeton, W.S. and J. Nunery. Evaluation of forest carbon management alternatives for northern hardwood-conifers. Forest Carbon Workshop. Nov. 17, 2009. University of New Hampshire, Portsmouth, NH.
- Keeton, W.S. Biomass development in late-successional northern hardwoods and evaluation of forest carbon management alternatives. Harvard Forest, Harvard University. Nov. 6, 2009. Petersham, MA.
- Keeton, W.S. Potential impacts of climate change on forests of the northeastern U.S. USFWS Lake Champlain Ecosystem Team meeting. Oct. 22, 2009, Essex Junction, VT.
- Keeton, W.S. Forest carbon management basics including options for New England. Forest Futures Meeting. September 16, 2009, Worcester, MA.

- Keeton, W.S. Old-growth forest baselines as a guide for in-stream restoration of large woody debris. USDA Forest Service Workshop on Stream and Riparian Restoration Using Large Wood, July 13 - 17, 2009, Rutland, VT.
- Keeton, W.S., Y. Bihun, M. Chernyavskyy, J. Farley, V. Kovalyshyn, I. Soloviy, and L. Zahvoyska. Linking ecological economics and sustainable forest management to provide ecosystem services in the Carpathian Mountains. Workshop on Securing the Sustainable Provision of Ecosystem Services in the Alps and the Carpathians. June 9, 2009, Bratislava, Slovak Republic.
- Keeton, W.S., S. Burrascano, J. Chen, M. Chernyavskyy, B. Commarmot, J. F. Franklin, D. Lindenmayer, J. Nunery, T. Spies, M. Swanson, and R. Van Pelt. A Global analysis of temperate old-growth forests: carbon storage and management implications for montane ecosystems. Invited seminar at the University of Rome La Sapienza, Plant Biology Department. May 11, 2009, Rome, Italy.
- Keeton, W.S. Biomass and carbon storage in old-growth temperate forests: implications for forest carbon management. Invited seminar at Univeritat fur Bodenkulture (University of Natural Resources and Applied Life Sciences), Institute for Forest Ecology. April 28, 2009, Vienna, Austria.
- Keeton, W.S., Y. Bihun, M. Chernyavskyy, J. Farley, V. Kovalyshyn, I. Soloviy, and L. Zahvoyska. Sustainable forest management in the Ukrainian Carpathian Mountains: an international scientific exchange. Trust for Mutual Understanding. March 21, 2009, New York, NY.
- Keeton, W.S. and J.S. Nunery. Forest carbon storage under alternate forest management approaches in northern hardwoods. New England Society of American Foresters Bi-Annual Meeting, Portland, ME, March 18-20, 2009.
- Keeton, W.S. and J.S. Nunery. Net effects on carbon storage of forest management approaches in northern hardwoods. Vermont Department of Forests, Parks, and Recreation Centennial Celebration, Climate Change Workshop. Randolph, VT, February 10, 2009

## 2008

- Keeton, W.S. and J. S. Nunery. Biomass development in late-successional northern hardwood-conifer forests: implications for forest carbon management. Northeastern Research Cooperative 2008 Conference. Nov. 12-13, Durham, NH.
- Keeton, W.S., S. Burrascano, J. Chen, M. Chernyavskyy, B. Commarmot, J. F. Franklin, D. Lindenmayer, J. Nunery, T. Spies, M. Swanson, and R. Van Pelt. A global analysis of temperate old-growth forests: commonality in carbon sequestration and storage. Invited seminar at Humboldt University, Geography Department. Nov. 5, 2008, Berlin, Germany.
- Ray, D., W.S. Keeton and J. S. Nunery. Managing forest carbon: a northeastern perspective. Forest Guild National Meeting. Oct. 29 - Nov. 1, 2008, Sandestin, FL.
- Keeton, W.S. Carbon markets: issues and opportunities for forestry. Invited seminar at the Ukrainian National Forestry University. October 16, 2008, L'viv, Ukraine.
- Keeton, W.S. Disturbance-based forestry as a foundation for ecosystem management in tolerant hardwood systems. North American Symposium on Ecosystem Management in Tolerant Hardwood Forests. May 13-15, 2008, University of Quebec at Outauais, Gatineau, Quebec, Canada.
- Keeton, W.S. Managing carbon in Vermont's forested ecosystems. The Rubenstein School Spring 2008 Seminar Series "Counting Carbon: Approaches for Reducing CO<sub>2</sub> Emissions, University of Vermont, Burlington, VT.
- Keeton, W.S. Managing northern hardwood forests for carbon storage. Vermont Roundtable on Forest Parcelization and Sprawl. Feb. 20, 2008, Randolph, VT.
- Keeton, W.S. Carbon markets and forests: Opportunities and challenges. "Focus the Nation," a national teach-in on climate change. Jan. 28, 2008, University of Vermont, Burlington, VT.

## 2007

- Keeton, W.S. Managing forests for carbon storage and resilience to climate change. Vermont Monitoring Cooperative Annual Meeting. Oct 26. 2007, Burlington, Vermont.



- Keeton, W.S. Applying sustainable forest management theory to the Carpathian Mountain ecoregion. Atelier on Ecological Economics and Sustainable Forest Management in Ukraine's Carpathian Mountains. Sept. 23-Oct. 1, 2007, L'viv, Ukraine.
- Keeton, W.S. Managing for complexity and carbon sequestration in northern hardwood forests. Forest Guild, New England Chapter, Annual Meeting. Sept. 10-11, Fairlee, VT. 2007.
- Keeton, W.S. Silvicultural options for managing carbon storage in northern hardwood forests. New England Society of American Foresters, Annual Meeting. March 22, 2007, Fairlee, VT.
- Keeton, W.S. Climate change effects on forest fires. April 2007. Climate Change Teach-In. University of Vermont, Burlington, VT.
- Keeton, W.S. Silvicultural alternatives for late-successional forest management in northern hardwood-conifer forests. University of Maine, School of Forest Resources, 2007 Seminar Series. January 2007, Orono, Maine.

#### 2006

- Keeton, W.S. The role of managed forestlands in environmental sustainability: perspectives from the United States of America. Conference on the Global Environmental Convention. Ukrainian National Forestry University. Sept. 26-30, 2006, L'viv, Ukraine.

#### 2005

- Keeton, W.S. and A. R. Troy. Balancing ecological and economic objectives while managing for late-successional forest structure. International Conference on Ecologisation of economy as a key prerequisite for sustainable development. Ukrainian National Forestry University. Sept. 23, 2005. L'viv, Ukraine.
- Keeton, W.S. Lessons from the Vermont Forest Ecosystem Management Demonstration Project. "Lessons from Large-Scale Manipulations of Ecosystems and Landscapes," Invitational workshop held at the Ecological Society of America 90th Annual Conference. April 7, 2005, Montreal, Canada.
- Keeton, W.S. Using restoration to accelerate late-successional/old-growth forest development. Late-Successional/Old-Growth Dialogue. National Commission on Science for Sustainable Forestry & Manomet Center for Conservation Sciences, April 27-28, 2005, Portland, ME.
- Keeton, W.S., C.E. Kraft, D.R. Warren, and A.A. Millward. Effects of old-growth riparian forests on coarse woody debris, debris dams, plunge pools, and light environment in Adirondack stream systems. Adirondack Regional Research Meeting. March 10-12, 2005, Old Forge, NY.
- Keeton, W.S. Structure-based forestry alternatives for northern hardwoods. Oral presentation and field tour for the Society of American Foresters, Green Mountain Chapter, September 16, 2005. Under Hill Center, VT.

#### 2004

- Keeton, W.S. Managing for old-growth structure in northern hardwood forests. The 6th eastern old-growth conference - Moving toward sustainable forestry: lessons from old-growth forests. September 23-26, 2004, Moultonborough, NH.
- Keeton, W.S. Restoration of old-growth forests based on research in successional and natural disturbance ecology: lessons from the Pacific Northwest and northern New England. Cornell University, Department of Natural Resources, 2004 Seminar Series. September 14, 2004, Ithaca, New York.
- Watzin, M., C. Hession, A. Troy, and W.S. Keeton. Linking land-use change, stream geomorphology, and aquatic biodiversity in a hierarchical classification scheme. Watershed Classification Workshop, U.S. Environmental Protection Agency. June 22-24, 2004, Washington, DC.
- Keeton, W.S. and C.E. Kraft. Effects of old-growth riparian forests on Adirondack stream systems. Adirondack Regional Research Meeting. March 2-3, 2004, Old Forge, NY.
- Keeton, W.S. Sustainable management of matrix forests as a measure of conservation success, with a focus on forest-stream linkages. Conservation Biology Seminar Series, University of Vermont, Rubenstein School of Environment and Natural Resources. November 4, 2004, Burlington, VT.
- Keeton, W.S. Incorporating natural disturbances into models of succession, ecological variability, and land classification. Conservation Biology Seminar Series, University of Vermont, Rubenstein School of Environment and Natural Resources. April 6, 2004, Burlington, VT.

- Keeton, W.S. The Vermont Forest Ecosystem Management Demonstration Project Area. Presentation and field tour for the Vermont Agency of Natural Resources and Vermont County Foresters. December 3, 2004. Mount Mansfield State Forest, VT.
- Keeton, W.S. Structure-based forestry: balancing multiple objectives in managed stands. USDA Forest Service, Green Mountain National Forest, Planning Advisory Group ("Blueberry Hill Group"). January 27th, 2004, Barre, VT.

### 2003

- Keeton, W.S. Long-term forest ecosystem responses to 19th and early 20th century restoration approaches in Vermont. Recovery of Earth, Place and Self: A Symposium on Ethical and Social Issues in Landscape Restoration. April 25-26, 2003. Burlington, VT.
- Keeton, W.S. Managing for forest structure as an element of forest ecosystem health. Vermont Forest Health Symposium. April 8, 2003. White River Junction, V

### 2002

- Keeton, W.S. Old-growth forest restoration: how do we do it and is it a relevant conservation issue in New England? Conservation Biology Seminar Series, University of Vermont, School of Natural Resources. October 24th, 2002.
- Keeton, W.S. Playing god with ecological succession: the intersection of ecosystem science and sustainable forestry. University of Vermont, Botany Department, Marvin Lecture Series. January 2002, Burlington, VT.
- Keeton, W.S. Conservation on working forests: adding tools to our forestry toolbox. Vermont Wildlife Forum, Sponsored by the National Wildlife Federation. October 4th, 2002. Montpelier, VT.
- Keeton, W.S. Uneven-aged, multi-aged, or disturbance-based forestry? Research on evolving silvicultural approaches. Vermont Consulting Foresters Association. May 2, 2002. Ethan Allan Firing Range, Jericho, Vermont.
- Keeton, W.S. Uneven-aged, multi-aged, or disturbance-based forestry? Research on evolving silvicultural approaches. Vermont Agency of Natural Resources. March 25, 2002. Essex Junction, VT.
- Keeton, W.S. The once and future forest in New England: history, variability, and future uncertainty. National Forest Planning Meeting, Sponsored by The Wilderness Society and USDA Forest Service. February 24, 2001. Fairlee, VT.

### *Contributed*

### 2020

- Keeton, W.S. and G.W. Meigs. Intermediate severity windthrow effects on forest structure and carbon dynamics in the eastern United States: implications for adaptive management. Catastrophic Wind Disturbance Workshop, University of Georgia. Nov. 30 – Dec. 1, 2020. Athens, GA (online).
- Keeton, W.S., D. Warren, and H. Kirchmeir. Future Forests – Future Streams: Experimental Acceleration of Late-Successional Forest-Stream Interactions. Hubbard Brook Cooperators Meeting (online), July 7-9, 2020.
- Keeton, W.S. Design workshop on dynamic forest-stream interactions: experimental acceleration of late-successional stream functions. Hubbard Brook Ecosystem Study (online), June 29, 2020.
- Thom, D., A.R. Taylor, R. Seidl, W. Thuiller, J. Wang, M. Robideau, and W.S. Keeton. Drivers, climate sensitivity, and management of functional diversity in northeastern North America. European Geophysical Union, General Assembly. May 4-8, 2020, Vienna, Austria (online).
- Thom, D, A.R. Taylor, R. Seidl, W. Thuiller, J. Wang, M. Robideau, and W.S. Keeton. Directing structural development can improve the functional response diversity of forests to climate change in northeastern North America. Managing forests in the 21st century. March 3-5, 2020, Potsdam, Germany.

### 2019

- Keeton, W.S. and D. Thom. Silviculture with birds in mind: effects of disturbance-based forestry practices on habitat characteristics and carbon storage. Forest Ecosystem Monitoring Conference, Dec. 13, 2019.

- Thom, D. and W.S. Keeton. Forest structure could mitigate negative impacts of climate change on functional diversity in northeastern North America. Forest Ecosystem Monitoring Conference, Dec. 13, 2019.
- Keeton, W.S., L. Vilà Vilardell, D. Thom, C. Gyeltshen, K. Tshering, and G. Gratzner. Climate change effects on forest fire hazards in the wildland-urban-interface of Bhutan. North American Forest Ecology Workshop, June 24-29, 2019, Flagstaff, AZ.
- Keeton, W.S. Silviculture for eastern old growth in the context of global change. Ecological Society of America, August 11-16, 2019, Louisville, KY.

#### 2018

- Keeton, W.S., G. Meigs, S. Burrascano, F. Sabatini, M. Svoboda, and G. Gratzner. European old-growth forests in a global context: expanding our conception of late-successional forests to account for structural and functional variability. 5<sup>th</sup> European Congress of Conservation Biology, June 12-15, 2018, Jyväskylä, Finland.
- Thom, D, W.S. Keeton. Multiple development pathways determine structural complexity and carbon storage in forests of the northeastern U.S. Ecological Society of America Annual Meeting, New Orleans, LA, August 4-10, 2018.
- Thom, D, W.S. Keeton. Structural development pathways in secondary northern forests indicate high potential for carbon-based forest management. Eastern Canada and U.S.A. Forest Science Conference, October 18-20, Fredericton, New Brunswick, Canada.
- Thom, D., W.S. Keeton. Ecosystem services and biodiversity as outputs of forest stand development in the American Northeast. Forest Ecosystem Monitoring Cooperative Annual Meeting, Burlington, VT. Dec. 14, 2018.

#### 2017

- Sabatini, F. M., Burrascano, S., Keeton, W. S., Levers, C., Lindner, M., Pötzschner, F.; Verkerk, H., and Kuemmerle, T. The last primary forest remnants in Europe: their spatial distribution and determinants. International Union of Forest Research Organizations (IUFRO), 125<sup>th</sup> Anniversary Congress, Freiburg, Germany. Sept. 18-22, 2017.
- Meigs, G.W. and W.S. Keeton. Intermediate-severity wind disturbance in mature temperate forests: Effects on legacy structure, carbon storage, and stand dynamics. Ecological Society of American Annual Conference. Portland, OR. August 6-11, 2017.

#### 2016

- Gottesman, A.J. and W.S. Keeton. Regeneration responses to management for old-growth characteristics in northern hardwood-conifer forests. Ecological Society of American Annual Conference. Ft. Lauderdale, FL. August 11, 2016.
- Meigs, G. and W.S. Keeton. Wind disturbance in temperate forest ecosystems. Forum Carpaticum. Bucharest, Romania, Sept 28-30, 2016.
- Urbano, A. and W.S. Keeton. Forest structural development and carbon dynamics as influenced by land-use history and reforestation approach. Eastern Canada and United States Forest Science Conference (ECANUSA). Burlington, Vt. Sept. 30, 2016.
- Gottesman, A.J. and W.S. Keeton. Regeneration responses to management for old-growth characteristics in northern hardwood-conifer forests. Eastern Canada and United States Forest Science Conference (ECANUSA). Burlington, Vt. Sept. 30, 2016.
- Meigs, G., W.S. Keeton, and A. Weisinger-Flood. Forest structure, composition, and regeneration following wind disturbance in mixed hardwood-conifer ecosystems. Eastern Canada and United States Forest Science Conference (ECANUSA). Burlington, Vt. Sept. 30, 2016.
- Keeton, W.S. and A.J. Gottesman, A.J. Regeneration responses to management for old-growth characteristics in northern hardwood-conifer forests. Vermont Monitoring Cooperative 2016 Conference. Burlington, VT. Dec. 2, 2016.

#### 2015

- Keeton, W.S., A.M. Mika, and C.E. Littlefield. Wood bioenergy production in the northeastern United States: understanding and avoiding negative ecological effects and increases in landscape-scale net carbon emissions. 17<sup>th</sup> International Landscape Ecology Symposium. Nitra, Slovakia. May 26-29, 2015.
- Keeton, W.S., O. Chaskovskyy, M. Chernyavskyy, S. Ford, D. Karabchuk, M. Svoboda, and V. Trotsiuk. Deconstructing the "cathedral old-growth:" Structural variability in Carpathian primary spruce-fir systems. Ecological Society of America annual conference, Baltimore, MD. Aug. 9-14, 2015.
- Urbano, A.R. and W.S. Keeton. Long-term forest carbon storage and structural development as influenced by land-use history in northern New England. Ecological Society of America annual conference, Baltimore, MD. Aug. 9-14, 2015.
- Ford, S.E. and W.S. Keeton. Managing northern hardwood forests for carbon storage through Structural Complexity Enhancement: effects on aboveground carbon pools. Ecological Society of America annual conference, Baltimore, MD. Aug. 9-14, 2015

#### 2014

- Keeton, W.S. Experimental gaps and biodiversity responses in the Vermont Forest Ecosystem Management Demonstration Project. Vermont Monitoring Cooperative Conference. December 11, 2014, Burlington, VT.
- Keeton, W.S. Opportunities for northeastern landowner participation in carbon markets. Vermont Legislative Summit. November 18, 2014.
- Keeton, W.S., O. Chaskovskyy, M. Chernyavskyy, D. Karabchuk, M. Svoboda, and V. Trotsiuk. Deconstructing the "cathedral old-growth:" Structural variability in Carpathian primary spruce-fir systems. Forum Carpaticum. L'viv, Ukraine. Sept. 16-18, 2014.

#### 2013

- Keeton, W.S., J.F. Franklin, D. Karabchuk, and S. Burrascano. A global perspective on old-growth forest restoration and silviculture: learning through shared experience. Plenary presentation. Primeval Beech Forests: Reference Systems for the Management and Conservation. L'viv, Ukraine, June 2, 2013.
- Knorn, J.; T. Kuemmerle, V.C. Radeloff, W.S. Keeton, V. Gancz, B. Valdimir; I.A. Biris, M. Svoboda, Miroslav, P. Griffiths, and P. Hostert. Contributed presentation. Continued loss of primeval beech forests in the Romanian Carpathians despite an increasing protected area network. Primeval Beech Forests: Reference Systems for the Management and Conservation. L'viv, Ukraine. June 3, 2013.

#### 2012

- Keeton, W.S. , E. Russell-Roy, and J. Pontius. Prospects for rehabilitation forestry through carbon market participation on former industrial timberlands. ECANUSA 2012, Durham, NH, Nov. 1-3, 2012.
- Keeton, W.S. Bioenergy harvesting impacts on stand structure and carbon fluxes in northern hardwood forests. Vermont Monitoring Cooperative annual meeting, Oct. 29, 2012, Burlington, VT.
- Littlefield, C. and W.S. Keeton. Bioenergy harvesting impacts on ecologically important stand structure and habitat characteristics. Ecological Society of America annual meeting. Portland, OR, Aug. 5-11, 2012.
- Mika, A. and W.S. Keeton. Factors contributing to carbon fluxes from bioenergy harvests in the U.S. Northeast: An analysis using field data. Ecological Society of America annual meeting. Portland, OR, Aug. 5-11, 2012.
- E.T. Russell-Roy, W.S. Keeton, J. Pontius, and C. Kerchner. Rehabilitation forestry and carbon market access on overharvested, former industrial northern hardwood-conifer forests. Ecological Society of America annual meeting. Portland, OR, Aug. 5-11, 2012.
- Keeton, W.S. Late-successional biomass development in riparian forests of the Adirondacks. Adirondack Research Meeting, Old Forge, New York, February 2012.
- Keeton, W.S. Potential for forest carbon projects in the Carpathian Mountains. Technical Workshop on Capacity Building for Forest Carbon Projects. Uzghorod, Ukraine, May 28-29, 2012.
- Karabchuk, D. and W.S. Keeton. Allometric and volumetric biomass estimation equations for Carpathian spruce. Forum Carpaticum. Stara Lesna, Slovakia, May 30-June 2, 2012.

Egan, A. and W.S. Keeton. Institutional barriers to community-based forest carbon projects in western Ukraine. Forum Carpaticum. Stara Lesna, Slovakia, May 30-June 2, 2012.

#### 2011

Keeton, W.S., T. Buchholz, C. Littlefield, and A. Mika. Scientific Assessment of Biomass Harvesting Impacts in the Northeastern U.S.. UVM Bioenergy Research Symposium. Burlington, VT, April 28, 2011.

Buchholz, T. and W.S. Keeton. Economics of Biomass Fuel Harvests in the Northeastern Forest. Heating the Northeast with Renewable Biomass Conference. Manchester, NH, April 14-15, 2011.

#### 2010

Keeton, W.S., P. Angelstam, M. Baumflek, Y. Bihun, M. Chernyavskyy, S. M. Crow, A. Deyneka, M. Elbakidze, J. Farley, V. Kovalyshyn, B. Mahura, S Myklush, J. R. Nunery, I. Solovity, and L. Zahvoyska. Sustainable forest management alternatives for the Carpathian Mountain region, with a focus on Ukraine. 1st Forum Carpaticum, Sept. 15-17, 2010. Krakow, Poland.

Bihun Y., W.S., Keeton, M. Ceroni. The east Carpathian biosphere reserve revisited: challenges and opportunities in transboundary cooperation in the coming decade. 1st Forum Carpaticum, Sept. 15-17, 2010. Krakow, Poland.

Kuemmerle T., Olofsson P., Chaskovskyy O., Baumann M., Ostapowicz K., Woodcock C.E., Houghton R.A., Hostert P., Keeton W.S., Radeloff V.C. Western Ukraine: effects on carbon fluxes and future carbon storage potential. 1st Forum Carpaticum, Sept. 15-17, 2010, Krakow, Poland.

Keeton, W.S.. Restoration of old-growth forest structure in the northeastern United States: experimental evaluation of silvicultural options. IUFRO World Congress, August 23-28, 2010, Seoul, Korea.

#### 2009

Keeton, W.S., S. Burrascano, J. Chen, M. Chernyavskyy, B. Commarmot, J. F. Franklin, A. J. Larson, D. Lindenmayer, J. S. Nunery, T. A. Spies, M. Swanson and R. Van Pelt. A global analysis of temperate old-growth forests: commonality and variability in structure and function. Ecological Society of America Annual Conference, Albuquerque, NM, August 2009.

Nunery, J.S. and W.S. Keeton. Forest carbon storage in the northeastern United States: effects of harvesting frequency and intensity including wood products. Ecological Society of America Annual Conference, Albuquerque, NM, August 2009.

Keeton, W.S. and J.S. Nunery. Biomass development in late-successional northern hardwood-conifer forests: implications for forest carbon management. Carbon in Northern Forests. June 10-11, 2009, Traverse City, MI. Keeton, W.S., C. Kraft, J. Stovall, M. Curzon, D.R. Warren, and J. Nunery. Old-growth riparian forests have dramatic effects on Adirondack stream habitats: a synthesis is of seven years of research. Adirondack Research Consortium, Old Forge, N.Y., March 4-5, 2009.

#### 2008

Keeton, W.S. Biomass development in riparian late-successional northern hardwood-hemlock forests: implications for forest carbon sequestration and management. Ecological Society of America 93rd Annual Conference. August 3-8, 2008, Milwaukee, WI.

Keeton, W.S. Long-term forest ecosystem responses to 19th and early 20th century reforestation approaches in New England: implications for forest carbon storage. 14th International Symposium on Society and Resource Management People and Place: Linking Culture and Nature. June 10-14, 2008, Burlington, VT.

Keeton, W.S., V. Kovalyshyn, J. Nunery, B. Magura, I. Neyko, and Y. Shovhan. Opportunities for sustainable forest management in the Carpathian Mountain Ecoregion. Special session on ecology and culture in the Carpathian Mountain Region. 14th International Symposium on Society and Resource Management. June 10-14, 2008, Burlington, Vermont.

Keeton, W.S., P. Angalstam, Y. Bihun, J. Chen, M. Chernyavskyy, B. Commarmot, J.F. Franklin, A.J. Larson, D. Lindenmayer, J. Nunery, T. Spies, M. Swanson, and R. Van Pelt. A global meta-analysis of temperate old-growth forests: structural characteristics, carbon storage, and management implications for montane ecosystems. Mountain Forests in a Changing World: Advances in research on sustainable management and

the role of academic education. April 2-4, 2008, University of Natural Resources and Applied Life Sciences, Vienna, Austria.

## 2007

- Keeton, W.S. Restoration of old-growth forest structure in the northeastern United States: experimental evaluation of silvicultural options. Ecological Society of America 92nd Annual Conference. August 5-10, 2007, San Jose, CA.
- Stovall, J., W.S. Keeton, and C.E. Kraft. Old-growth riparian forest structure, understory light environment, and periphyton production in low order streams, Adirondack Mountains, NY. Ecological Society of America 92nd Annual Conference. August 5-10, 2007, San Jose, CA.
- Curzon, M.T. and W.S. Keeton. Spatial pattern and dynamics of canopy gaps in old-growth Adirondack forests. Ecological Society of America 92nd Annual Conference. August 5-10, 2007, San Jose, CA.
- Smith, K. and W.S. Keeton (presenter). Understory plant responses to alternate uneven-aged silvicultural practices in northern hardwood forests. Ecological Society of America 92nd Annual Conference. August 5-10, 2007, San Jose, CA.
- Keeton, W.S. Biomass accumulations in mature and old-growth riparian northern hardwood-conifer forests: implications for forest carbon sequestration. 6th North American Forest Ecology Workshop. June 18-22, 2007, Vancouver, British Columbia, Canada.

## 2006

- C.E. Kraft, W.S. Keeton, and D.R. Warren. Structure of old-growth riparian forests and effects on in-stream wood, Adirondack Mountains, New York, U.S.A. International Conference on Riverine Hydroecology: Advances in Research and Applications, Stirling, Scotland, U.K., August 13-18, 2006.
- Warren, D.R., W.S. Keeton, and C.E. Kraft. Stream woody debris volume, bankfull width, and riparian forest age in northeastern North America. International Conference on Riverine Hydroecology: Advances in Research and Applications, Stirling, Scotland, U.K., August 13-18, 2006.

## 2005

- Keeton, W.S., C.E. Kraft, D.R. Warren, and A.A. Millward. Structure of old-growth riparian forests and effects on stream habitats, Adirondack Mountains, New York. Ecological Society of America 90th Annual Conference. August 7-12, 2005, Montreal, Canada.
- Williams, L. and W.S. Keeton. Measurement and modeling of vertical structure responses to structural complexity enhancement treatments in northern hardwood forests. Ecological Society of America 90th Annual Conference. August 7-12, 2005, Montreal, Canada.
- McKenny, H.C. and W.S. Keeton. Effects of structural complexity enhancement on red-backed salamanders (*Plethodon cinereus*) in northern hardwood forests. Ecological Society of America 90th Annual Conference. August 7-12, 2005, Montreal, Canada.
- Manaras, K., W.S. Keeton, T. Donovan, and B. Mitchell. Effects of forest structure on avian habitat selection: scale-dependency in occurrence prediction and structure-based forest habitat classification. Ecological Society of America 90th Annual Conference. August 7-12, 2005, Montreal, Canada.
- Copeland, E. and W.S. Keeton. Riparian vegetation structural variability and linkages with stream geomorphology in the Lake Champlain Basin, Vermont. Ecological Society of America 90th Annual Conference. August 7-12, 2005, Montreal, Canada.
- Foster, B.C., D. Wang, and W.S. Keeton. Does certification make a difference? Ecological Society of America 90th Annual Conference. August 7-12, 2005, Montreal, Canada.
- Keeton, W.S. Managing for late-successional structural complexity: a key element of matrix management in the northern hardwood region. 5th North American Forest Ecology Workshop. June 12-16, 2005, Aylmer, Quebec, Canada.
- Keeton, W.S., C.E. Kraft, D.R. Warren, and A.A. Millward. Effects of old-growth riparian forests on Adirondack stream systems: implications for restoration and landscape management. 5th North American Forest Ecology Workshop. June 12-16, 2005, Aylmer, Quebec, Canada.
- Keeton, W.S., H. McKenny, C.W. Kilpatrick, B. Materick, M. Skinner, A. Strong, D. Tobi, A. Troy, and L.

Williams. Vermont Forest Ecosystem Management Demonstration Project: Year 5 results. Annual Meeting of the Vermont Monitoring Cooperative. October 14, 2005, Burlington, VT.

#### 2004

Keeton, W.S. Managing for old-growth structure in northern hardwood forests. Balancing ecosystem values: innovative experiments for sustainable forestry, IUFRO (International Union of Forest Research Organizations) International Workshop. August 15-10, 2004, Portland, OR.

Keeton, W.S., C.E. Kraft, D.R. Warren, and A.A. Millward. Effects of old-growth riparian forests on Adirondack stream systems. The 6th eastern old-growth conference - Moving toward sustainable forestry: lessons from old-growth forests. September 23-26, 2004, Moultonborough, NH.

Keeton, W.S., H. McKenny, C. Danks, C.W. Kilpatrick, B. Materick, M. Skinner, A. Strong, D. Tobi, A. Troy, and L. Williams. Vermont Forest Ecosystem Management Demonstration Project. Annual Meeting of the Vermont Monitoring Cooperative. October 8, 2004, Burlington, VT.

#### 2003

Keeton, W.S. Post-treatment results of the Vermont Forest Ecosystem Management Demonstration Project. Annual meeting of the Vermont Monitoring Cooperative. March 21, 2003. Burlington, Vermont.

Donovan, T. M., R. Long, A. Troy, A. Vionov, and W. S. Keeton. Land use change in Northern Forests: assessments and recommendations for conserving biodiversity. First meeting of the Northeastern States Research Cooperative. Nov 15-16, 2003. Burlington, VT.

#### 2002

Keeton, W.S. The Vermont Forest Ecosystem Management Demonstration Project. A workshop conducted at the annual meeting of the Vermont Monitoring Cooperative. March 18, 2002. Burlington, Vermont.

#### 2001

Keeton, W.S. and J.F. Franklin. Reproductive role of remnant old-growth trees in mature Douglas-fir forests, southern Washington Cascade Range. Ecological Society of America 86th Annual Conference, August 2001. Madison, WI.

#### 2000

Keeton, W.S. and J.F. Franklin. Climate variability and forest fires in the Pacific Northwest. Ecological Society of America 85th Annual Conference, August 2000. Snowbird, UT.

#### 1999

Keeton, W.S. and J.F. Franklin. Landform associations of residual old-growth trees in unmanaged Douglas-fir forests of the southern Washington Cascade Range. Ecological Society of America 84th Annual Conference, August 8-12, 1999. Spokane, WA.

#### 1996

Keeton, W.S. and G.H. Aplet. Ecosystem management in the Interior Columbia River Basin. Annual Conference of the Washington Chapter of The Wildlife Society: "Ecosystem Management for Wildlife Conservation in the Pacific Northwest," October 24-25, 1996. Olympia, WA.

#### 1995

Aplet, G.H and W.S. Keeton (presenter). Historic range of variability as a coarse-filter for biodiversity conservation. The Wildlife Society Annual Conference, Sept. 12-17, 1995. Portland, OR.

### *Posters*

- Meigs, G., W.S. Keeton, K. Bryan, E. Buford, A. Cano, C. Danks, G. Galford, M. Golivets, W. Kuentzel, L. Mattison, J. O'Neil-Dunne, T. Ricketts, L. Sonter, A. Strong, K. Wallin, D. Wang. Social-ecological drivers of forest change and ecosystem services across Vermont. Northeastern Ecosystem Research Cooperative. Saratoga Springs, NY. March 24-15, 2015.
- Burrascano, S., W.S. Keeton, F.M. Sabatini, and C. Blasi. Commonality and variability in the structural attributes of moist temperate old-growth forests: A global review. Poster Presentation. Primeval Beech Forests: Reference Systems for the Management and Conservation. L'viv, Ukraine. June 4, 2013.
- Karabchuk, D., W.S.Keeton, M. Horoshko, P. Khomiuk, and Y. Bihun. Accounting for canopy position in biomass and carbon sequestration evaluations of natural *Picea abies* stands in the Ukrainian Carpathian Mountains. Poster Presentation. Primeval Beech Forests: Reference Systems for the Management and Conservation. L'viv, Ukraine. June 4, 2013.
- Auch, W.E., R.A. Salmon, J.R. Sheperd, M.J. Peters, and W.S. Keeton. 2008. Preliminary evidence of deep soil and CWD carbon burial and storage in an old-growth hemlock forest, Adirondack Mountains, NY. Soil Science Society of America, Joint Annual Meeting, October 5-9, 2008, Houston, TX.
- C.E. Kraft, D.R. Warren, and W.S. Keeton. Spatial patterns of wood distribution across stream size and riparian forest age in northeastern North America. International Conference on Riverine Hydroecology: Advances in Research and Applications, Stirling, Scotland, U.K., August 13-18, 2006.
- Kraft, C.E., D.R. Warren, W.S. Keeton, and A.A. Millward. Wood dynamics along the terrestrial-aquatic boundary in northeastern forests. Northeastern States Research Cooperative Conference, October 27-28, 2006, Durham, New Hampshire.
- Keeton, W.S. Managing for old-growth forest structure in northern hardwood forests: experimental test of a new silvicultural system. Fourth North American Forest Ecology Workshop, Corvallis, Oregon, June 2003.
- Keeton, W.S. and J.F. Franklin. Effects of remnant old-growth trees on succession in mature Douglas-fir forests, southern Washington Cascade Range. Fourth North American Forest Ecology Workshop, Corvallis, Oregon, June 2003.
- Keeton, W.S. and D.R. Tobi. Vermont sustainable forest management demonstration project. Annual Meeting of the New England Society of American Foresters, April 2003, Burlington, VT.
- Keeton, W.S. and D.R. Tobi. Vermont sustainable forest management demonstration project. Annual Meeting of the Vermont Monitoring Cooperative, April 21 2003, Burlington, VT.
- Keeton, W.S. , A.M. Strong, D.R. Tobi, and S. Wilmot. Experimental test of structural complexity enhancement in northern hardwood-hemlock forests. The Forest Information Exchange: Forest Structure - A Multi-Layered Conversation. October 25, 2001, Orono, Maine.