

Mark Rudnicki

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Experience

2015-present – **Professor of Practice:** School of Forest Resources and Environmental Science, Michigan Technological University, Houghton, MI.

2015-present – **Executive Director:** Michigan Forest Biomaterials Institute, Houghton, MI.

2010-2014 - **Associate Professor:** Department of Natural Resources and the Environment, University of Connecticut, Storrs CT.

2004-2010 - **Assistant Professor:** Department of Natural Resources and the Environment, University of Connecticut, Storrs CT.

2003-2004 - **Assistant Professor of Forest Resources:** University of Alaska Southeast, Ketchikan, AK.

2002-2002 - **Post-Doctoral Fellow:** Department of Forest Sciences, University of British Columbia. Vancouver, British Columbia.

Education

Doctor of Philosophy in **Forest Biology & Management.**
University of Alberta, Edmonton. Conferred June 6th 2002

Master of Science in **Forestry.**
Michigan Technological University. Houghton, Michigan. Conferred December 17th 1997

Bachelor of Science in **Natural Resources Management**
Colorado State University. Fort Collins, Colorado. Conferred December, 14th 1991

Foreign Exchange Student
Lincoln University (Renewable resources program), Canterbury, New Zealand. Spring 1990

Professional Memberships

Structural Engineering Association of Michigan
Forest Products Society
Michigan Forest Association
Society of American Foresters
Michigan Association of Timbermen
Great Lakes Timber Professionals Association

Course Instruction

Michigan Technological University.

FW 3089 Adding Value to Biomaterials – Fall 2016 - present

FW 3097 Forest Biomaterials – Fall 2018

University of Connecticut.

NRE 3500 - Exurban Silviculture

NRE 3690 - Field Study Internship

NRE 4455 - Forest Ecology

NRE 4475 - Forest Management

NRE 5461 - Landscape Ecology (Graduate)

NRE 6000 - Research Methods in Natural Resources (Graduate)

NRE 1000 - Environmental Science

NRE 3699 - Independent Study (Tree biomechanics, Forest Health & Protection, Advanced Forest Ecology, Silviculture)

NRE 4689 - Undergraduate Research (Tree sway motion capture and analysis)

NRE 5252 - Physiology and Ecology of Trees (Graduate)

NRE 5694 - Natural Resources Seminar

University of Alaska Southeast.

NSCI 193 - Dendrology

GEOL 104 - Physical Geology

University of Alberta

RR 601 - Forest Biology (Graduate)

Presentations

Mark Rudnicki. *Wind and the Forests of Southeast Alaska*. October 2004. Invited talk at Society of American Foresters, Connecticut Chapter meeting.

CT 4-H club – Presentation on how climate and local environment effects tree growth. November 13th 2005

Mark Rudnicki. *Current Forest Research at the College of Agriculture and Natural Resources*. Invited talk for state-level forum at the Connecticut Forest Research Forum: From Laboratory to Field. September 28, 2006. Hartford, CT

Mark Rudnicki. *Wind in the trees forest walk*. February 2007. Field learning event organized by the Connecticut State Museum of Natural History. 2-hour hike into the UConn forest explaining the many effects of wind on forest structure and function.

Mark Rudnicki. *Tree Failure and the International Tree Failure Database*. Workshop Co-Hosted with Brian Kane (University of Massachusetts) at the 1st Connecticut Conference on Natural Resources. March 2007

Mark Rudnicki. *Forest Response to Chronic Wind*. Invited talk to the Yale School of Forestry and Environmental Studies, Global Institute of Sustainable Forestry. October 30th 2008.

Bruno Moulia and Mark Rudnicki. *Wind Acclimation of forest trees: looking forward !* IUFRO Research Conference: Wind & Trees. July 31-Aug 4th 2011. Atlanta, GA

Mark Rudnicki. *Understanding Tree Sway and Crown Collisions*. Department of Geography Colloquium Series, University of South Carolina, Columbia, SC. March 16th 2012

Mark Rudnicki. *Tree Hazard Mitigation Research at the University of Connecticut*. Connecticut Tree Protective Association Meeting. July 19, 2012, Farmington, CT

Mark Rudnicki. *How Neighboring Trees Influence the Risk of Failure*. The Morton Arboretum. Tree Risk Assessment – The Biomechanics of Stability, Strength, and Structure. Lisle, Illinois, September 24-25th, 2012.

Mark Rudnicki. *Tree sway and acclimation to wind*. The Connecticut Urban Forest Conference & The Connecticut Forest Forum. October 30, 2013, Plantsville, CT

Mark Rudnicki. *Managing Trees to Enhance Wind Acclimation*. 2013 American Society of Consulting Arborists Annual Conference. December 4-7, 2013. Mohegan Sun, Uncasville, CT

Mark Rudnicki. *Managing Trees for Wind Stability*. Rhode Island Nursery and Landscape Association Winter Meeting 2014. January 16-17, Kingston, RI

Mark Rudnicki. *Vegetation Management and Damage Prediction Modeling Research at the University of Connecticut*. Northeast Utilities, Vegetation Management ALL HANDS Meeting. Storrs, CT. January 24th 2014.

Mark Rudnicki. *STORMWISE: Storm resilient trees and power*. Third Climate Impact Mitigation and Adaptation Conference (CIMA 3). UConn Storrs campus, Storrs CT. March 31st 2014.

Mark Rudnicki. *Power outages from tree-hazards*. Connecticut Climate adaptation Academy. UConn Avery Point Campus, Groton, CT. May 3, 2014.

Mark Rudnicki. *Vegetation Management Research for Resilient Energy*. KEYNOTE Speaker. Storm Summit: Sharing Ideas and Inspiring Research, Utility Arborist Association. Philadelphia, PA. June 23rd – 24th, 2014

Mark Rudnicki. *Stormwise: Increasing the Storm Resilience of Trees*. WEBINAR hosted by UConn CLEAR (Center for Land use Education And Research). Wednesday, July 23rd, 2014. <http://www.youtube.com/watch?v=FfRtb3vsLxs&feature=youtu.be>

Mark Rudnicki. *Resilient Trees, Resilient Power - The Stormwise program: Reducing the risk of tree-related storm damage to power lines*. New Jersey Shade Tree Federation Conference 89th Annual Conference. October 24th 2014.

Mark Rudnicki. *STORMWISE – An Initiative to Manage Trees and Forests for Storm Resilience*. Department of Environmental Conservation Seminar Series. University of Massachusetts, Amherst, MA. November 14th, 2014.

Mark Rudnicki. *Stormwise: An initiative to increase the storm resilience of trees*. The Morton Arboretum Urban Tree Conference: Managing Urban Forests in a Changing Climate, Chicago, Illinois. November 18–19, 2014.

Mark Rudnicki. *MiFBI and REFORGE Updates*. SFRES School Advisory Board Meeting, March 26th, 2015. Houghton, MI

Mark Rudnicki. *MiFBI and REFORGE Updates*. Michigan SAF Spring Meeting, April 9th, 2015. Marquette, MI

Mark Rudnicki and Terry Sharik. *Michigan Forest Biomaterials Initiative*. April 28th, 2015, Michigan Farm Bureau Forestry Advisory Committee, Escanaba MI.

Mark Rudnicki and Terry Sharik. *Michigan Forest Biomaterials Initiative*. May 21st, 2015, University of Minnesota, Natural Resources Research Institute (NRRI), Duluth MN.

Terry Sharik and Mark Rudnicki. *Update on Michigan Forest Biomaterials Initiative*. May 28th, 2015, MiFBI Steering Committee Meeting. Gaylord University Center, Gaylord, MI

Terry Sharik and Mark Rudnicki. *Update on Michigan Forest Biomaterials Initiative*. June 29th-30th, 2015, MiFBI Academic Institutions Meeting. Gaylord University Center, Gaylord, MI

Mark Rudnicki. *Funding for Forest biomaterials research*. June 29th-30th, 2015, MiFBI Academic Institutions Meeting. Gaylord University Center, Gaylord, MI

Mark Rudnicki. *Michigan's forest & Wood industries - Cluster Mapping*. June 29th-30th, 2015, MiFBI Academic Institutions Meeting. Gaylord University Center, Gaylord, MI

Mark Rudnicki. *Michigan Forest Biomaterials Initiative- Introduction and Overview*. Seminar to Department of Chemical and Paper Engineering, Western Michigan University. July 9th, 2015.

Mark Rudnicki. *Michigan Forest Biomaterials Initiative*. Presentation to Michigan Forest Products Council Board Meeting. Traverse City, MI. July 23rd, 2015.

Mark Rudnicki and Terry Sharik. *Michigan Forest Biomaterials Initiative*. Michigan Forest Association. Munising, MI. August 8th, 2015.

Mark Rudnicki and Terry Sharik. *Michigan Forest Biomaterials Initiative*. Presentation to Center for Automotive Research Visit to MTU. September 4, 2015.

Terry Sharik and Mark Rudnicki. *Michigan Forest Biomaterials Initiative-Working to create a renewable and sustainable future*. 2015 Green Lecture Series. Houghton, MI. October 1, 2015

Mark Rudnicki. *Michigan Forest Biomaterials Initiative-Working to create a renewable and sustainable future*. Great Lakes Kiln Dryers Association, Alberta, MI. October 1, 2015.

Mark Rudnicki. *REFORGE Michigan* Presentation Michigan Association of Timberman Board Meeting, Makinaw city, MI. October 9th 2015

Mark Rudnicki. *REFORGE Michigan*. Testimony/presentation to the Michigan Senate Natural Resources Policy committee, Lansing, MI. October 21, 2015.

Mark Rudnicki and Rich Kobe. *The Role of Michigan's Academic Institutions in the Forest Products Sector*. Governor's 2015 Forest Products Summit Kellogg Center, East Lansing. October 28th, 2015.

Mark Rudnicki, Rich Kobe, Terry Sharik. *REFORGE Michigan*. Presentation to the DNR Timber Advisory Committee, Escanaba, MI. February 5th, 2016.

Mark Rudnicki, Rich Kobe, Terry Sharik. *REFORGE Michigan*. Presentation to the Zero Waste to Landfill Group. Grand Rapids, MI. February 11th, 2016.

Mark Rudnicki. REFORGE presentation and Meeting with Chemistry and Chem Engineering Faculty about prospects of research in the area of black liquor. February 24th, 2016

Mark Rudnicki, Rich Kobe, Terry Sharik. *REFORGE Michigan*. Presentation to SFI training meeting. Wakefield, MI. April 8th, 2016.

Mark Rudnicki. *Michigan Forest Biomaterials Institute-Working to create a renewable and sustainable future*. NCASI Northern Regional Meeting, Wausau, WI. May 3-5th, 2016

Mark Rudnicki. *The Forest Biomaterials Initiative*. Tech Talks, Michigan Tech Research Forum, Houghton. (November 11, 2016).

Mark Rudnicki. *MIFBI and a Forest Bioeconomy in Michigan*. Michigan Bio-Based Economy Forum, MichBIO, East Lansing, MI. (October 27, 2016).

Mark Rudnicki. *Forest Biomaterials -Fundamental for a renewable and sustainable future*. Michigan SFI Logger Training, Sustainable Forestry Initiative, Bergland, MI. (October 7, 2016).

Mark Rudnicki. *Forest Biomaterials -Fundamental for a renewable and sustainable future*. Michigan SFI Logger Training, Sustainable Forestry Initiative, Pickford, MI. (September 23, 2016).

Mark Rudnicki. *Forest Biomaterials -Fundamental for a renewable and sustainable future*. Leadership Keweenaw Program, Keweenaw Chamber of Commerce, Houghton, MI. (September 15, 2016).

Mark Rudnicki. *Forest Biomaterials -Fundamental for a renewable and sustainable future*. Environmental Science Teacher Workshops, Western Upper Peninsula Center for Science, Mathematics and Environmental Education, Houghton, MI. (July 14, 2016)

Mark Rudnicki. *Michigan A Forest Bioeconomy is Taking Root in Michigan*. SFI Logger Training, Sustainable Forestry Initiative, Wakefield, MI. (April 7, 2017).

Mark Rudnicki and William Lytle. Michigan SFI Logger Training, "Introduction to Social License & Houghton County Forest Products Industry" Sustainable Forestry Initiative, Wakefield, MI. (April 7, 2017).

Mark Rudnicki. *A Forest Bioeconomy is Taking Root in Michigan*. Michigan SFI Logger Training, Sustainable Forestry Initiative, Escanaba, MI. (March 10, 2017).

Mark Rudnicki. *Michigan A Forest Bioeconomy is Taking Root in Michigan*. SFI Logger Training, Sustainable Forestry Initiative, Iron Mountain, MI. (March 9, 2017).

Mark Rudnicki and William Lytle. *Introduction to Social License & Houghton County Forest Products Industry*. Michigan SFI Logger Training, Sustainable Forestry Initiative, Iron Mountain, MI. (March 9, 2017).

Mark Rudnicki and William Lytle. *Introduction to Social License & Houghton County Forest Products Industry*. Michigan SFI Logger Training, Sustainable Forestry Initiative, Escanaba, MI. (March 9, 2017).

Mark Rudnicki. *A Forest Bioeconomy is taking root in Michigan*. Michigan Legislators visit to MTU, Scott Dianda, Houghton, MI. (March 4, 2017).

Mark Rudnicki. *A Forest Bioeconomy is taking root in Michigan*. Visit by Senator Debbie Stabenow to MTU., Houghton, MI. (April 1, 2017).

Mark Rudnicki. *A Forest Bioeconomy is taking root in Michigan*. Enabling Circular Economy Regionally. Meeting organized by Guiding Green. Midland, MI (June 9, 2017)

Mark Rudnicki, Bob Ross, Terry Sharik, and Lisa Perez., *Wonders Of Wood*, Michigan Department of Natural Resources Outdoor Adventures Center, Detroit, MI. July 29, 2017

Mark Rudnicki, Bob Ross, Terry Sharik, and Lisa Perez. *Wonders of Wood*, Maker Faire, Henry Ford Museum of American Innovation, Dearborn, MI. July 30, 2017.

Mark Rudnicki, Bob Ross, Terry Sharik, and Lisa Perez.. *Wonders of Wood*. Greening of Detroit, Detroit, MI. Presented to nearly 100 high school students in Detroit. July 31, 2017.

Mark Rudnicki. *A Forest Bioeconomy is taking root in Michigan*. Keweenaw Unitarian Universalist Fellowship Sunday Forum. Houghton, MI (August 13, 2017)

Mark Rudnicki. *A Forest Bioeconomy is taking root in Michigan*. Western Upper Peninsula Planning & Development Region annual meeting. Keynote Speaker. Twin Lakes, MI (September 18, 2017)

Mark Rudnicki. *A Forest Bioeconomy is taking root in Michigan*. WEBINAR. Midwestern Governors Association Regional Focus Event. Online. (September 21, 2017)

Mark Rudnicki. *A Forest Bioeconomy is taking root in Michigan*. Brimley middle School, Brimley. Houghton, MI (September 22, 2017).

Mark Rudnicki. *A Forest Bioeconomy is taking root in Michigan*. November 7, 2017. Gave forest biomaterials presentation to MTU students that are part of the TREEHOUSE program.

Mark Rudnicki. *Wood Recycling*. April 25, 2019. DEQ Upper Peninsula Solid Waste Forum.

Mark Rudnicki. *Michigan's Circular Bioeconomy*. May 3, 2019. Gave forest biomaterials presentation to 65 loggers at JM Longyear event in South Range, MI.

Mark Rudnicki. *Michigan's Circular Bioeconomy*. September 11, 2019. Gave global audience presentation the the Michigan Forest Biomaterials Institute and forest bioeconomy in Michigan. World Bioeconomy Summit. Ruka, Finland.

Mark Rudnicki. *Michigan's Circular Bioeconomy*. October 8, 2019. Gave forest biomaterials presentation 17 AmeriCorps Volunteers during visit to MTU.

Mark Rudnicki. *Mass Timber: Opportunity for cost competitive, breathtaking buildings that fight climate change*. October 8, 2019. Carnegie Museum, Houghton, MI

Event Leader

MTU Symposium on Forest Biomaterials. March 20th 2015. Featured 10 speakers from across campus with introduction from Provost Seel. Planned and executed event.

MiFBI Steering Committee meeting- May 28-29th 2015. Planned and arranged meeting and agenda. ~25 attendees. Gaylord, MI.

MiFBI Academic Meeting – June 29th-30th, 2015. With Others, planned and arranged meeting and agenda. 8 Michigan institutions in attendance. Gaylord, MI.

Project GREEN and Agriculture industry relations to REFORGE and Forestry.
Presentation by Phil Korson. Cherry Marketing Institute, Dewitt, MI. May 12th, 2016.

Michigan Forest Products Checkoff program and REFORGE meeting. Chaired meeting of forest industry, state govt. with MTU and MSU to discuss and plan re-launching efforts to create a Michigan forest products industry assessment program. Gaylord, MI. June 1, 2016.

Advancing Mass Timber Buildings and Manufacturing in Michigan -Michigan Academic Institutions Meeting. August 3-4, 2016. Organized workshop held in Madison, WI. Attended by MTU, MSU, UofM and Ferris State and researchers and administrators from the USDA forest products lab.

Michigan Forest Bioeconomy Conference. February 2-3, 2017. Led the planning of agenda, organized multiple planning meetings for speaker agenda. Designed and printed agenda and conference brochure and prospectus for sponsors. Solicited sponsorships. Handled finances and planning for venue, food and basically spent many many hours preparing for this meeting. Attended by 133.

Michigan Mass Timber Workshop. July 24-25, 2017. Plan and execute the Invited speakers, arranged registration, sponsorships, venue, meals, AND continuing education credits for American Institute of Architects and SEAMi (Structural Engineering Association of Michigan). Posted talks online (MIFBI website). Grand Rapids, MI.

Kraft Lignin Innovation Forum. October 11-12, 2017. Planned and facilitated the Invited key participants from Michigan industry, and academia for short presentations and discussions. Wrote and distributed to attendees a meeting summary with actionable items. Iron Mtn. Michigan.

Conferences/Events - Participant

US Chamber of Commerce Roundtable, Houghton, MI. January 14th, 2015

National Renewable Energy Lab, Advanced Supply Chain workshop. Golden CO. February 3-4, 2015

SFI in Michigan – 20 Years, Gladstone MI. February 25th, 2015

DNR Forest Management Advisory Council, Marquette, MI. April 4th, 2015

SAF Meeting, Marquette, MI. April 9-10th, 2015

Michigan Farm Bureau Meeting, Escanaba, MI. April 28th 2015

LIGNA Conference, Hannover Germany. May 10-14, 2015

Forest Economies Conference, Florence WI. April 16th, 2015

Michigan Timberman Meeting, Frankenmuth, MI. April 17th, 2015

RCN Biofuels Pan American workshop, Houghton, MI June 5th, 2015

Society Wood Science and Technology 2015 International Convention, Jackson, WY. June 7-12, 2015

DNR Forest Management Advisory Council, Lansing, MI. July 7th, 2015

Great Lakes Timber Professionals, regional meeting, Crystal Falls, MI. August 17th, 2015

Michigan UP legislative meeting on biomass energy in the UP. Attendees were: David Nyberg, Robert Froese, Steve Walsh, Representative Scott Dianda, and Senator Tom Casperson.

Keeping UP on Energy meeting hosted by Varnum Law. Sept 16th, 2015. Landmark hotel, Marquette, MI.

UP Energy Summit. Northern Michigan University, Sept 30th 2015. Marquette MI.

Workshop on Mass Timber (CLT) Research. USFS Forest Products Laboratory, Madison, WI. November 11-12, 2015

Automotive Communities Partnership Meeting. Center for Automotive Research. Detroit, MI. January 13th, 2016

Mass Timber Conference. Portland, Oregon. March 21-24, 2016

Great Lakes Timber Professionals, Annual Spring Meeting, Harris, MI. April 11th, 2016

Zero Waste to Landfill Group, April Meeting. Grand Rapids, MI. April 14th, 2016

Michigan Association of Timberman Annual Meeting. Frankenmuth, MI. April 15th, 2016.

12th Annual Sustainable Forestry Conference, Florence, WI. April 21, 2016.

Wood QC 2016 – Modelling wood quality, supply and value chain networks. Laval University, Quebec City, Quebec. June 12-17, 2016.

Forest Products Society Annual Meeting. Portland, OR. June 27-29, 2016.

Zero Waste to Landfill group meeting. Grand Rapids, MI. August 11th, 2016

2016 Michigan Rail Conference. Marquette, MI. August 17-18, 2016

North American Forest Partnership Launch Event. Washington DC. September 6-7th, 2016

I/UCRC Wood Based Composites board meeting. October 12-13th, 2016.

Annual Regional Meeting. Great Lakes Timber Professionals Association. Felch, MI. November 11th, 2016

Local Innovation Strengthening Rural Economies. Panel discussion hosted by Aspen Institute. Washington DC. February 10th, 2017.

Loggers Forum. Gladstone, MI. March 21st, 2017.

Foresters for Fish, Spring SAF Conference. Marquette, MI. March 30-31, 2017.

Spring Celebration, Great Lakes Timber Professionals Association. Green Bay, WI. April 10th, 2017.

13th Annual Sustainable Forestry Conference, Florence, WI. April 20, 2017.

Michigan Association of Timbermen Annual Meeting. Boyne Highlands, MI. April 28th, 2017.

NCASI Northern Regional Meeting. Wausau, WI. May 2-5, 2017.

IUFRO 2017 Division 5 (wood products) Conference & Society Wood Science and Technology International Convention. Vancouver, BC, Canada. June 12-16, 2017

Forest Products Society International Convention. Mississippi. June 25-28, 2017.

Ubanwood tour & woodworking showcase. Ann Arbor, MI. July 28th, 2018
World Bioeconomy Forum. Ruka, Finland. September 2018 and 2019.

Publications

Bunce A. Volin J. Miller D. Parent J. Rudnicki M. (2019) Determinants of Tree Sway Frequency in Temperate Deciduous Forests of the Northeast United States. 266-267. *Agricultural and Forest Meteorology*.

Pringle A.M. Rudnicki M. and Pearce J. (2017) Wood Furniture Waste-Based Recycled 3-D Printing Filament. *Forest Products Journal*. <https://doi.org/10.13073/FPJ-D-17-00042>

Ross R.J. Wang X.; Rudnicki, M. 2017. New technologies aid in assessing trees. *The Forestry Source* 22:2:22-23. Society of American Foresters.

Rudnicki M. Wang X. Ross R. Xiping W. and Prezinski K. (2016) Measuring Wood Quality in Standing Trees. Gen. Tech. Rep. FPL-GTR-248. Madison, WI: US Department of Agriculture, Forest Service, Forest Products Laboratory. 248:13 p.

Hiscox A.L. Rudnicki M. and Miller D.R. (2015) Understanding turbulent kinetic energy (TKE) stationarity within a forest canopy. *Agricultural and forest meteorology*. 214: 124-133

Xue Z. Miller D.R. Rudnicki M. and Hiscox A. (2014) Methodology to Determine Dynamic Wind Gust Impressions from Tree Sway Measurement in a Coniferous Forest Canopy. *Agricultural and Forest Meteorology*. Accepted with revisions.

Webb V.A. Rudnicki M. and Muppa S.K. (2013) Analysis of tree sway and crown collisions for managed *Pinus resinosa* in southern Maine. *Forest Ecology and Management*. 302: 193-199.

Murphy K.D. and Rudnicki M. (2012) A Physics-Based Link Model for Tree Vibrations. *The American Journal of Botany* 99(12): 1918-1929.

Granucci, D.V. Rudnicki, M., A.L. Hiscox, Su, H.-B. and Miller D.R. (2012) Quantifying the effects of freezing on tree sway frequency. *Agricultural and Forest Meteorology*. 168 (2013) 10-14.

Webb V.A. and Rudnicki M. (2009) A Linear Analysis of the Interaction Between the Atmosphere and an Underlying Compliant Plant Canopy. *Boundary Layer Meteorology*. 133:93-111.

Rudnicki M. Meyer T.H. Silins U. Lieffers V.J. and Webb V.A. (2008) The periodic motion of lodgepole pine trees as affected by collisions with neighbors. *Trees: Structure and Function*. 22: 475-482.

Rudnicki M. and Meyer T. (2007) Methods to convert local sampling coordinates into geographic information system/global positioning systems (GIS/GPS)-compatible coordinate systems. *Northern Journal of Applied Forestry*. 24(3): 233-238

Rudnicki M. and Burns D.P. (2006) Branch sway period of 4 tree species using 3-D motion tracking. *Proceedings of the Fifth Plant Biomechanics Conference, STFI- Packforsk, Stockholm, Sweden* 25-30.

- Meng S.X., Lieffers V.J., Reid D.E.B., Rudnicki M., Silins U. and Jin M. (2006) Reducing stem bending increases the height growth of tall pines. *Journal of Experimental Botany*. 57(12):3175-3182; doi:10.1093/jxb/erl079
- Meng S.X., Rudnicki M., Lieffers V.J., Reid D.E.B. and Silins U. (2006) Preventing crown collisions increases the crown cover and leaf area of maturing lodgepole pine. *Journal of Ecology*. 94(3): 681-686 doi: 10.1111/j.1365-2745.2006.01121.x
- Vollsinger, S., Mitchell S.J., Byrne K.E., Novak M.D. and Rudnicki M. (2005) Wind tunnel measurements of crown streamlining and drag relationships for several hardwood species. *Canadian Journal of Forest Research* 35(5) 1238-1249
- Rudnicki M., Mitchell S.J. and Novak M.D. (2004) Wind tunnel measurements of crown streamlining and drag relationships for three conifer species. *Canadian Journal of Forest Research* 34: 666-676
- Rudnicki M., Silins U. and Lieffers V.J. (2004) Crown cover is correlated with relative density, tree slenderness and tree height in lodgepole pine. *Forest Science* 50(3): 356-363
- Chen J., Song B., Moeur M., Rudnicki M., Bible K., Shaw D.C., Braun D.M. and Franklin J.F. (2004) Coherent spatial relationships of species distribution and above-ground biomass in an old-growth *pseudotsuga-tsuga* forest. *Forest Science* 50(3): 364-375
- North M., Chen J., Song B., Rudnicki M. and Oakley B. (2004) Forest stand structure and pattern of old-growth Douglas-fir and mixed-conifer forests. *Forest Science* 50(3): 299-311
- Rudnicki M., Lieffers V.J. and Silins U. (2003) Stand structure governs the crown collisions of lodgepole pine. *Canadian Journal of Forest Research* 33: 1238-1244
- Rudnicki M., Silins U., Lieffers V.J. and Josi G. (2001) Measure of simultaneous tree sways and estimation of crown interactions among a group of trees. *Trees: Structure and Function* 15: 83-90
- Rudnicki M. and Chen J. (2000) Relations of climate and radial increment of western hemlock in an old-growth Douglas-fir forest in southern Washington. *Northwest Science* 74 (1): 57-68

Proceedings

Bunce, A. (Presenter), DiFalco, S., Fahey, R., Hale, D., Kloster, D., Marek, N., Morzillo, A., Parent, J., Julia Rogers, J., Rudnicki, M., Volin, J., Ward, J., Witharana, C. and Worthley, T. Adapting Adaptive Silviculture to Exurban Forest Socioecological Systems. IUFRO 2020 Wind and Trees Conference. 24-28 February, 2020. Rotorua, New Zealand.

Bunce, A. (Presenter), DiFalco, S., Fahey, R., Hale, D., Kloster, D., Marek, N., Morzillo, A., Parent, J., Julia Rogers, J., Rudnicki, M., Volin, J., Ward, J., Witharana, C. and Worthley, T. Adapting Adaptive Silviculture to Urban-Exurban Socioecological Systems. Ecological Society of America annual meeting. Louisville, MO. August 11-16, 2019.

Rudnicki, M. (Presenter), Pearce, J. M., Pringle, A., Advancements in Fiber-Polymer Composites Symposium, "Viability of Up-Cycling Wood Furniture Waste to 3-D Printing Filament" Forest Products Society, Madison, WI. (May 16, 2017 - May 18, 2017).

Rudnicki, M. (Presenter), Dickinson, Y., Wang, X., Ross, R. Non-destructive Wood Quality Assessment and Application to Forest Management. 20th International Nondestructive Testing and Evaluation of Wood Symposium. Madison, WI. (September 12–15, 2017).

Rudnicki M., Worthley T. and J. Volin. STORMWISE: An Initiative to Mitigate Storm Damage to Forest Edges and the Electrical Infrastructure. Society of American Foresters/CIF/IUFRO National Convention. Salt Lake City, Utah. October 8-11, 2014.

Rudnicki M., Worthley T. and J. Volin. Dynamic Tree Sway Response After Storm Resiliency Management. International Society of Arboriculture Annual International Conference and Trade Show. Milwaukee, Wisconsin, August 2-6, 2014.

Rudnicki M., and K. Murphy. A Physics-Based Model for Tree and Branch Vibrations. International Society of Arboriculture Annual International Conference and Trade Show. Toronto, Canada. August 3-7, 2013.

Klinck J., Rudnicki M. and T. Worthley. Deciduous Tree Sway Frequency Along a Forested Edge. March 18th 2013. Connecticut Conference on Natural Resources, Storrs, CT.

Rudnicki M., Worthley T. and J. Volin. Mitigating Tree Hazards by Managing the Forest Edge for Stability. March 18th 2013. Connecticut Conference on Natural Resources, Storrs, CT.

Rudnicki M., Murphy K. and A. Campiformio. Branch Motion of Mature Decurrent Crowns: Experimental and Theoretical Analysis. 7th Plant Biomechanics International Conference. Clermont-Ferrand, France. August 20-24, 2012.

Rudnicki M., Hiscox A., Muppa S., Su H.-B. and D. Miller. Sway Measurement of a Large Array of Trees Coupled With Canopy Turbulence - An Overview. First Conference on Atmospheric Biogeosciences, 29 May–1 June 2012, Boston, MA.

Su H.-B., Rudnicki M., Hiscox A. and D. Miller. SwayLES: a coupled large-eddy simulation tree-sway model 30th AMS Conference on Agricultural and Forest Meteorology. 29 May–1 June 2012, Boston, MA.

Rudnicki M. and D.V. Granucci. Quantifying the response of conifers under freezing conditions. IUFRO Research Conference: Wind & Trees. July 31-Aug 4th, 2011. Atlanta, GA.

Web V.A. and M. Rudnicki. Sway and collision dynamics of red pine. IUFRO Research Conference: Wind & Trees. July 31-Aug 4th 2011. Atlanta, GA.

Su, H.-B., Hiscox A., Rudnicki M. and D. Miller. A Coupled 3-D Large-Eddy-Simulation-Tree-Sway Model. IUFRO Research Conference: Wind & Trees. July 31-Aug 4th 2011. Atlanta, GA.

Rudnicki M. and V.A. Web. Modeling and measuring crown collisions for managed *Pinus resinosa* in southern Maine. 8th North American Forest Ecology Workshop, Roanoke VA. June 19-23, 2011.

Web V.A. and M. Rudnicki. Theoretical and Empirical analysis of Crown Collisions in a Forest Canopy. Ecological Society of America, Annual Meeting. Pittsburgh, PA, August 2-6th.

Campiformio A.T. and M. Rudnicki. Assessing Branch Sway Dynamics Using 3D Motion Capture. Tree Biomechanics Research Week and Symposium. The International Society of Arboriculture. Shalersville, OH, August 21- 27, 2010.

Rudnicki M. and V.A. Webb. Crown Collisions in a Forest Canopy. Tree Biomechanics Research Week and Symposium. The International Society of Arboriculture. Shalersville, OH, August 21-27, 2010.

Web V.A. and M. Rudnicki. Estimating Wind Forces and Bending Moments In a Forest Stand Before and After Thinning. 2nd International Conference on Wind Effects on Trees, University of Freiburg, Germany, October 10-13, 2009.

Su, H.-B., Rudnicki M., Miller D., Hiscox A. and V.A. Webb. Large-Eddy Simulation of the Aerodynamic Interactions between Canopy Roughness Sublayer Turbulence and Tree-Sway Motions 2nd International Conference on Wind Effects on Trees, University of Freiburg, Germany, October 10-13, 2009.

Hall S., Jones M. and M. Rudnicki. Visualization and automation of forest sway. 2nd International Conference on Wind Effects on Trees, University of Freiburg, Germany, October 10-13, 2009.

Webb V.A. and M. Rudnicki. Tree motion and bending stresses in response to wind. Eastern CANUSA Forest Science Conference. October 17-18, 2008. University of Maine, Orono, Maine.

Rudnicki M. and V.A. Webb. Damped periodic sways in pine and maple canopies. Oral presentation. IUFRO Section 8.01.11 International Conference on Wind and Trees. August 5–9, 2007. Vancouver, British Columbia, Canada.

Webb V.A. and M. Rudnicki. A simple linear model for estimating energy losses from crown collisions. Poster presentation. IUFRO Section 8.01.11 International Conference on Wind and Trees. August 5–9, 2007. Vancouver, British Columbia, Canada.

Rudnicki M., Lieffers V.J., Silins U. and S.X. Meng. Tree crown collisions and their role in crown shyness and forest stand development. Ninth Annual Northeastern Forest Mensurationist Meeting, November 2-3, 2005. Freeport, Maine.

Rudnicki M. and T.H. Meyer. Tree sway and the effect of crown collisions. Poster presentation at Ecological Society of America annual meeting. Montreal, Quebec, August 7-12, 2005.

Mitchell S.J., Rudnicki M., Novak M. and K. Byrne. Drag relationships for conifer species from coastal British Columbia. 4th International Plant Biomechanics Conference. East Lansing, Michigan, June 6-10, 2003.

Rudnicki M., Silins U. and V.J. Lieffers. How stand structure affects the crown collisions of lodgepole pine. Oral presentation at Ecological Society of America annual meeting. Madison, Wisconsin, August 5-10, 2001.

Rudnicki M., Silins U., Lieffers V.J. and G. Josi. Measuring tree wind sways and estimating their crown interactions. Oral presentation at Ecological Society of America annual meeting. Snowbird Utah, August 5-10, 2000.

Rudnicki M., Lieffers V.J. and U. Silins. Assessing crown abrasion in an even-aged lodgepole pine stand. Poster presentation at Research Revelations 1999. University of Alberta, Edmonton Alberta, February 5th, 1999.

Rudnicki M. and J. Chen. Effects of climate on correlations between height class and radial growth of Western Hemlock in an old growth ecosystem. Oral presentation at Ecological Society of America annual meeting. Albuquerque, New Mexico, August 10-14, 1997.

Service

Current

Advisory Board Member of the World Bioeconomy Forum 2019-2020. Ruka, Finland.

Advisory committee member – Tech Forward Team on Advanced Materials and Manufacturing.

Coordinator of Industrial Research, Innovation, and Commercialization, School of Forest Resources and Environmental Science, Michigan Technological University. 2018 – present.

MTU Faculty Senate, Senator. 2018 to present

Member Administrative Policy Committee 2018-present

Chair, Administrative Policy Committee. 2019-present

MTU Faculty Senate, Alternate Member. 2017-2018

Member - General Education and Assessment Committee

Sands Pilot Plant, building manager for SFRES. 2017 - present.

Member of Governing Board for the Michigan Tech Enterprise Program (2016-present)

Past

Member of the SFRES Wood Science Faculty Search committee. Fall- Spring 2015-2016.

Forest Science Coordinator, 2013-2014. New England Society of American Foresters (NESAF). Executive committee position to provide NESAF with an effective means for the development, dissemination, and use of forest sciences across 4 SAF divisions and 6 states.

Internship committee. 2013-2014- College of Agriculture and Natural Resources

Tree Protection Examination Board. 6/6/2012-2014. Governor Appointee. Duties include creating/updating written exam and conducting oral exam of applicants for Arborist license in state of Connecticut.

Executive committee member of Atmospheric Sciences Group (representing the Dept of Natural Resources and the Environment). University of Connecticut. 2008-2014.

Member of Courses and Curriculum Committee. Department of Natural Resources and the Environment. University of Connecticut 2006 – 2014.

Chair of Courses and Curricula Committee. 2009- 2013. Department of Natural Resources and the Environment, University of Connecticut

Lead annual forest walk 2005-2014. Associated with the annual College of Agriculture and Natural Resources, Cornucopia Fest!, My tour consists of a 2-hr walk through the UConn forest explaining its history, ecology and management to the public.

Faculty Advisor for Forestry and Wildlife Club, 2007 – 2014. Oldest student group on campus whose signature activity is the production of maple syrup from the UConn forest.

Faculty Advisor for Uconn Timber Team, 2008 – 2014. Competitive student group (formed in 2008) which hosts annual invitational meets and in its short history has produced nationally ranked timber sports competitors.

University of Connecticut Liaison to CT Department of Energy and Environment for planning and hosting No Child Left Inside – Great Park Pursuit, 2-day event at UConn Storrs Campus. Spring 2014.

Committee member, College of Agriculture and Natural Resources Courses and Curricula committee. 2009-2013. University of Connecticut

Co-founder and steering committee co-chair (with Jason Vokoun) of: Connecticut Conference on Natural Resources – Many Resources, One Environment. First hosted in March 2007, this annual conference has quickly become the signature event for the Department of Natural Resources and the Environment. <http://www.ccnr.uconn.edu/>

Atmospheric Science Group (University level), Committee Chair 8/25/2007- 2009. Led formation of inter-departmental/inter-college Atmospheric Science Group (ASG) for the purpose of elevating atmospheric and related science research at UConn to national prominence. I represented UConn at the October 2008 UCAR membership meeting in Boulder, CO where the University was elected to membership. <http://www.cese.uconn.edu/ASG/index.html>

University of Connecticut Graduate Faculty Council – Representative for the Department of Natural Resources and the Environment, 2005-2009.

College of Agriculture and Natural Resources - Committee on Excellence, 2006 – 2009.

Connecticut Urban Forest Council – Board of Directors Member 2006-2008.

Seminar Series Committee (NRE Department), 2005 – 2008.

Ad hoc reviewer for journals:

Forest Ecology and Management

Journal of Ecology

Forest Science

Canadian Journal of Forest Research

European Journal of Forest Research

Trees: Structure and Function

Forestry (Oxford)

IEEE – Computing in Science and Engineering

Probabilistic Engineering Mechanics

Graduate Students (major advisor)

MS Graduated

Daniel P. Burns (2006)
Nicholas McIntosh (2010)
Anna Campiformio (2012)
William Lytle (2016)
Amanda Bunce (2017)

Ph.D. Graduated

Vincent Allen Webb - A Theoretical and Experimental Investigation of Crown Collisions in a Forest Canopy. PhD. Dissertation, University of Connecticut. Degree conferred Spring 2011.

Post-Doctoral Fellows

Shravan Kumar Muppa (2012-2013). Spatio-temporal interactions of tree sway and coherent wind structures in a mature conifer forest. (Funded by the National Science Foundation)
Jason Parent (2014-2016) LiDAR based tree risk assessment. (Funded by Northeast Utilities)

Doctoral Advisory Committee Member

Munkaila Musah September 5, 2017 - May 1, 2020

Grants

Pending

Hardwood Cross-Laminated Timber for Enhanced Infrastructure Resilience, Economic Prosperity, and Environmental Sustainability

PI: Qingly Dai. Co-Pi's: Andrew Swartz, David Watson, Dan Dowden, David Shonnard, Xinfeng Xie, Jenny Apriesnig, Allison Mills. Project Coordinators: Mark Rudnicki and Melanie Watkins
Sponsor: National Science Foundation – Leap Hi
Submitted: September 1, 2019
Request: \$1,699,627

Research & Development Measurement and Validation of In-Plane Structural Design Properties for Diaphragm Design with ANSI/PEG 320 Grade V2 CLT and Beetle-Killed Spruce CLT

PI: Qingly Dai. Co-Pi: Mark Rudnicki, Yvette Dickinson, Xinfeng Xie
Sponsor: US Dept of Agriculture
Submitted: February 25, 2019
Request: \$240,777

Current Grants

Demonstrate the Durability of Enhanced Domestic Hardwoods for U.S. Army Tactical Trailer Decking

PI: Xinfeng Xie. Co-Pi: Mark Rudnicki
Sponsor: US Dept of Agriculture
Award: \$184,928

Starting Date: September 3, 2019 Ending Date: August 31, 2022

Facilitating the establishment of a mass timber building on the campus of Michigan Technological University

PI: Mark Rudnicki. Co-Pi: Jacob Guter, Micheal Abbott
Sponsor: US Endowment for Forestry & Communities Inc
Amount of Award: \$100,000
Starting Date: August 1, 2019 - July 31, 2021

Research & Development Lignin-based cost-effective renewable polyols for polyurethane formulations

PI: Xinfeng Xie. Co-Pi: Mark Rudnicki, David Shonnard
Sponsor: Ford Motor Co
Amount of Award: 199,945
Starting Date: January 1, 2019 - December 31, 2020

Biocarbon- A Renewable and Lightweight Functional Filler for Polymer Composites.

PI: Xingeng Xie. Co-PI's: Mark Rudnicki, Robert Handler, and Patricia Heiden.
Sponsor: Ford Motor Company.
Amount of award: \$200,000
Starting Date: 6/1/2019 - 5/31/2020

Ensuring salvaged, beetle-killed trees are utilized for the highest and best use through the application of new technologies

PI: Yvette Dickinson. Co-PI's: Mark Rudnicki, John Forsman
Sponsor: US Forest Service, Wood Innovations Funding Opportunity
Amount of award: \$222,949
Starting Date: 6/1/2016 - 12/31/2019

Michigan Wood Innovation Team

PI: Don Peterson. Co-PI's: Mark Rudnicki, George Berghorn, Anthony Weatherspoon, Jessica Simons
Sponsor: US Forest Service, Wood Innovations Funding Opportunity
Amount of award: \$249,750
Starting Date: 9/1/2016 - 12/31/2020

Completed Grants

Training Forestry Graduates In Landscape-Scale Sustainability Planning: Integrating Decision-Science With Social-Ecological Geospatial Models

PI: Chadwick Rittenhouse. Co-PI's: Mark Rudnicki, John Volin, Thomas Worthley, Daniel Civco and Jason Vokoun
Source of Support: USDA NIFA National Needs Graduate Fellowships Program
Project Location: University of Connecticut
Total Award Amount: \$286,000
Starting Date: 2/1/2014 Ending Date: 1/31/2018

CONS00906, Biomechanical assessment of silvicultural treatments to enhance wind firmness of forest edge trees in southern New England

PI: Mark Rudnicki Co-PI: Thomas Worthley

Source of Support: USDA McIntire-Stennis

Project Location: University of Connecticut

Total Award Amount: \$88,400

Starting Date: 10/01/2012

Ending Date: 9/31/2017

Biomaterials— environmentally responsible use of our urban and rural natural resources.

PI: Ross, R.J. CO-PI: Bal, T.; Perez, L.; Brashaw, B.K.

Branching Out to Urban Audiences. USDA Forest Service.

Total Award: \$4,500.

Starting Date: 2/1/2017

Ending Date: 10/1/2017

Nondestructive Testing Techniques for Use in U.S. Forest Service Forest Inventory and Analysis Program

PI: Mark Rudnicki

Source of Support: US Forest Service, Joint Venture Agreement

Total amount of award: \$25,000 +10,000 supplemental (35,000 total)

Starting Date: 6/1/2015

Ending Date: 12/1/2017

Upcycling Furniture Manufacturing Waste into 3-D Printed Parts

PI: Joshua Pearce Co-PI: Mark Rudnicki, Glenn Larkin

Source of Support: BIFMA (Business and Institutional Furniture Manufacturers Trade Association)

Total Award: \$25,000

Starting Date: 2/15/2016

Ending Date: 2/16/2017

Northeast Utilities Center for Resilient Energy (NURE)

PI: Emmanouil Anagnostou (CEE) Co-PI: Brian Hartman (Math), Marina Astitha (CEE), Peng Zhang (EE), Peter Luh (EE)

Award amount 7,000,000

PI: Mark Rudnicki Co-PI: Thomas Worthley, John Volin, Christine Kirchhoff, Anita Morzillo

Award amount 3,000,000

Source of Support: Northeast Utilities

Project Location: University of Connecticut, Storrs, CT

Total Award Amount: \$10,000,000

Starting Date: 09/01/2015

Ending Date: 08/31/2020

Project: The United Illuminating Company Participation in the 2-year Demonstration Activity

PI: Emmanouil Anagnostou Co-PI's: Mark Rudnicki, Brian Hartman, Marina Astitha

Source of Support: The United Illuminating Company

Project Location: University of Connecticut

Total Award Amount: \$495,000

Starting Date: 2/15/2014

Ending Date: 2/16/2016

Northeast Utilities Bridge Funding – Infrastructure Damage Modeling

PI: Emmanouil Anagnostou (CEE) Co-PI's: Mark Rudnicki (NRE), Brian Hartman (Math)

Source of Support: Northeast Utilities (Industry)

Project Location: University of Connecticut

Total Award Amount: \$1,130,000

Starting Date: 5/20/2013 Ending Date: 5/31/2015

“Stormwise:” An innovative approach to forest stewardship, public outreach and stakeholder collaboration at the landscape scale.

PI: Thomas Worthley Co-PI: Mark Rudnicki and Jeff Ward

Source of support: US Forest Service State and Private Forestry FY 2013 Northeastern Area Competitive Grant Program.

Total Award Amount: \$273,000

Starting Date: July 2013 Ending Date: June 2016

Northeast Utilities Bridge Funding – Vegetation Management

PI: Mark Rudnicki Co-PI: Thomas Worthley, John Volin

Source of Support: Northeast Utilities (Industry)

Project Location: University of Connecticut

Total Award Amount: \$730,000

Starting Date: 5/20/2013 Ending Date: 5/31/2015

Tree biomechanics and mitigating tree hazards

PI: Mark Rudnicki. Co-PI's: Brian Kane (University of Massachusetts), Jason Grabosky (Rutgers), Greg Dahl (University of West Virginia).

2013 NERA Planning Grants (Northeastern Regional Association of State Agricultural Experiment Station Directors)

Total Award: \$8,000

Starting Date: May 2013 Ending Date: December 2014.

Collaborative Research: Measurement and Modeling of Aerodynamic Interactions between Tree-Sway Motion and Turbulence in and above a Forest Canopy.

PI: Mark Rudnicki. Co-PI: David R. Miller (University of Connecticut)

PI: Hong-Bing Su (East Carolina University)

PI: April Hiscox (University of South Carolina)

National Science Foundation – Program in Physical and Dynamic Meteorology.

Total award: \$832,708

Starting Date: 2/1/ 2009 Ending Date: 2/1/ 2012.

Interactions of Wind and Northeastern Forest Canopies.

PI: Mark Rudnicki

USDA McIntire-Stennis project CONS00788. Storrs Agricultural Experiment Station.

Estimated total: \$40,800

October 1, 2009-September 30, 2012.

Assessing Deciduous Forest Structure In Connecticut Using Imagery And Lidar.

PI: Mark Rudnicki Co-PI's: Daniel Civco, and Thomas Meyer
USDA McIntire-Stennis project CONS00823. Storrs Agricultural Experiment Station.
Estimated total: \$40,800
October 1, 2007-September 30, 2010.

Interactions of Wind and Northeastern Forest Canopies.

PI: Mark Rudnicki
USDA McIntire-Stennis project CONS00788. Storrs Agricultural Experiment Station.
Estimated total: \$50,800
October 1, 2005-September 30, 2008.

The Effects of Wind on Tree Sway and Stability.

PI: Mark Rudnicki
TREE FUND – Hyland Johns Grant Program.
Direct costs: \$14,350
August 28th 2005- August 29th 2007.

Interacting Fluid and Structural Mechanics in Forest Canopies

PI: Mark Rudnicki
University of Connecticut, Center for Environmental Sciences and Engineering – GRA Competition.
Total costs - \$11,254
January 8th 2008 – May 21st 2008.

Capturing the Three Dimensional Motion of Branch Sway

PI – Mark Rudnicki
University of Connecticut, Research Advisory Council – Junior Faculty Summer Fellowship
Award - \$2,738
June 2005 – August 2005

POPULAR PRESS

Video, Michigan Tech News, Science and Technology Publications. (April 26th, 2017) “Forest Biomaterials Research”. Produced by Stefanie Sidortsova. https://www.youtube.com/watch?v=f_u00Q-W2xs.

Newspaper, MiBiz. (March 19, 2017). “Federal legislation could bolster Michigan’s wood products industry”. Written by John Wiegand.

Newspaper, MiBiz. (September 4, 2016). “Manufacturing base key to growing state’s forest products industry, experts say”. Written by John Wiegand.

Newspaper, MiBiz.com. (May 29, 2016). “Going 3-D: Manufacturers say tech drives sustainability, revenue”. Written by John Wiegand.

2014 Patrick Skahill, interview with Patrick Skahill as part of the WNPR broadcast, “Can Science Build Stronger Trees in Connecticut?,” http://wnpr.org/post/can-science-build-stronger-trees-connecticut#disqus_thread, Air date Tuesday, February 18th, 2014

2014 Brian Dowling, "UConn Researchers Go Into The Woods In Search Of New Ways To Protect Power Lines", The Hartford Courant, February 12, 2014. Also online at: http://articles.courant.com/2014-02-12/news/hc-uconn-trees-utilities-20140212_1_more-wind-trees-forest