

## BARBARA J. BENTZ

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### Education

**B.S. Forestry and Biology**, Stephen F. Austin State University, Nacogdoches, TX, 1981  
**M.S. Forest Resources**, University of Idaho, Moscow, ID, 1984  
**Ph.D. Entomology**, Virginia Polytechnic Institute and State University, Blacksburg, VA, 1991

### Professional Experience

1991 – present Research Entomologist, USDA Forest Service, RMRS, Logan, UT  
1999 – 2005 Project Leader, USDA Forest Service, RMRS, Logan, UT

### Publications

- Lerch A.P., Pfammatter J.A., Bentz B.J., Raffa K.F. *Accepted*. Mountain pine beetle dynamics and reproductive success in post-fire lodgepole and ponderosa pine forests in northeastern Utah. PLoSOne.
- Marini L, Økland B, Jönsson A.M., Bentz B.J., Carroll A.L., Forster B., Grégoire J.C., Hurling R., Nageleisen L.M., Netherer S., Ravn H.P., Weed A., Schroeder M. *Accepted*. Climate drivers of bark beetle outbreak dynamics in Norway spruce forests. *Ecography*.
- Bentz B.J., Hood S.M., Hansen E.M., Vandygriff J.C., Mock K.E. 2016. Defense traits in the long-lived Great Basin bristlecone pine and resistance to the native herbivore mountain pine beetle. *New Phytologist*. doi: 10.1111/nph.14191
- Krivan V., Lewis M., Bentz B.J., Bewick S., Lenhart S.M., and Liebhold A. 2016. A dynamical model for bark beetle outbreaks. *Journal of Theoretical Biology*. 407:25-37.
- Ramsfield T.D., Bentz B.J., Faccoli M., Jactel H., and Brockerhoff E.G. 2016. Forest health in a changing world: Effects of globalization and climate change on forest insect and pathogen impacts. *Forestry*, 89:245-252.
- Kolb T.E., Fettig C.J., Bentz B.J., Stewart J.E., Weed A.S., Hicke J.A., Ayres M.P., and Mathiasen R. 2016. Observed and anticipated impacts of drought on forest insects and diseases in the United States. *Forest Ecology and Management*, <http://dx.doi.org/10.1016/j.foreco.2016.04.051>
- Kolb T.E., Fettig C.J., Bentz B.J., Stewart J.E., Weed A.S., Hicke J.A. and Ayres M.P. 2016. Forest insect and fungal pathogen responses to drought. Pp. 113-128 ,IN J.M Vose, J.S. Clark, C.H. Luce, and T. Patel-Weynand (eds), *Effects of Drought on Forests and Rangelands in the United States: A Comprehensive Science Synthesis*, USDA Forest Service, Gen. Tech. Report WO-93b.
- Bentz, B.J., J.P. Duncan, J.A. Powell. 2016. Elevational shifts in thermal suitability for mountain pine beetle population growth in a changing climate. *Forestry* 89(3):271-283, doi:10.1093/forestry/cpv054
- Raffa, K.F., B.H. Aukema, B.J. Bentz, A.L. Carroll, J.A. Hicke and T.E. Kolb. 2016. Responses of tree-killing bark beetles to a changing climate, C. Bjorkman, and P. Niemela (eds), *Climate Change and Insect Pests*, CABI,
- Bentz, B.J., C. Boone and K. F. Raffa. 2015. Tree response and mountain pine beetle attack preference, reproduction, and emergence timing in mixed whitebark and lodgepole pines. *Forest and Agriculture Entomology* 17(4):421-432, DOI:10.1111/afe.12124

- Anderegg, W.R.L., J.A. Hicke, R.A. Fisher, C.D. Allen, J. Aukema, B. Bentz, S. Hood, J.W. Lichstein, A.K. Macalady, N. McDowell, Y. Pan, K. Raffa, A. Sala, J.D. Shaw, N.L. Stephenson, C. Tague and M. Zeppel. 2015. Tree mortality from drought, insects and their interactions in a changing climate. *New Phytologist*. 208(3):674-683, DOI: 10.1111/nph.13477
- Régnière, J., B.J. Bentz, J. A. Powell and R. St-Amant. 2015. Individual-based modeling: Mountain pine beetle seasonal biology in response to climate, pp. 125-164, *In*, Simulation Modeling of Forest Landscape Disturbances, A.H. Perera, B. R. Sturtevant, and L.J. Buse (eds), Springer.
- Raffa, K.F., B.H. Aukema, B.J. Bentz, Al. Carroll, J.A. Hicke, and T.E. Kolb. 2015. Responses of tree-killing bark beetles to a changing climate, *In* Climate Change and Insect Pests, Christer Bjorkman and Pekka Niemela (eds), CABI Climate Change Series.
- Vandygriff, J.C., E. Hansen, B.J. Bentz, K. Allen, G.D. Amman and L. Rasmussen. 2015. Long-term efficacy of diameter-limit thinning to reduce mountain pine beetle-caused tree mortality in a lodgepole pine forest. *Forestry Chronicle*, 91(4):444-456.
- Addison, A., J.A. Powell, B.J. Bentz, and D.L. Six. 2015. Integrating models to investigate critical phenological overlaps in complex ecological interactions: The mountain pine beetle-fungus symbiosis. *Journal of Theoretical Biology* 368:55-66.
- Weed, A.S., B.J. Bentz, M.P. Ayres and T.P. Holmes. 2015. Geographically variable response of *Dendroctonus ponderosae* to winter warming in the western United States. *Landscape Ecology* 30(6):1075-1093.
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- Weed, A.S., M.P. Ayres, and B.J. Bentz. 2015. Population dynamics of bark beetles, Chapter 4, *In* Vega, F. and R. Hofstetter eds., *Bark Beetles: Biology and Ecology of Native and Invasive Species*, pp. 157-176. Elsevier.
- Bentz, B.J. and A.M. Jönsson. 2015. Modeling bark beetle responses to climate change. Chapter 13, *In* Vega, F. and R. Hofstetter eds., *Bark Beetles: Biology and Ecology of Native and Invasive Species*, pp. 533-549. Elsevier.
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- Hood, S. and B.J. Bentz. 2007. Predicting post-fire Douglas-fir beetle attacks and tree mortality in the northern Rocky Mountains. *Canadian Journal of Forest Research* 37:1058-1069.
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### **Invited Presentations**

- Bentz BJ. 2016. Tree response and mountain pine beetle attack preference: A tale of two ecosystems. North American Forest Insect Work Conference, Washington DC, May.
- Bentz BJ. 2015. Variable vulnerability of high elevation pines to mountain pine beetle. Whitebark Pine Ecosystem Foundation Annual Meeting, Ashland, OR.
- Bentz BJ. 2015. Bark beetle disturbances and natural range of variation. Intermountain Region Planning workshop, Ogden, UT, December.
- Bentz BJ. 2015. What's UP with mountain pine beetle in high elevation forests? RMRS Leadership Team meeting, Ogden, UT, April.
- Bentz, B.J. 2014. Complexities in predicting forest insect response to changing climate. Invited presentation in symposium 'Forest Entomology: Beyond Saving Trees'. Entomological Society of America Annual Meeting, Portland, OR, November.
- Bentz, B.J. 2014. *Dendroctonus ponderosae*, the tree killer, confronts climate change. Invited presentation in symposium 'Is climatic change modifying the characteristics of insect damage in forests?', International Union of Forestry Research Organizations (IUFRO) World Congress, Salt Lake City, UT, October.
- Bentz, B.J. 2014. Bark beetles and climate change: Implications for mountainous regions of the western US. MntClim Conference, CIRMOUNT, Midway UT, September.
- Bentz, B.J. 2013. Phenology and life history characteristics of the mountain pine beetle and Jeffrey pine beetle. California Forest Pest Council, November.
- Bentz, B.J. 2013. Native bark beetles in the Rocky Mountains, US. San Juan Bark Beetle Workshop sponsored by Western Water Assessment and Mountain Studies Institute, Durango, CO, April.
- Bentz, B.J. 2013. Native bark beetles in Colorado: Climate Change Implications. San Juan Bark Beetle Workshop sponsored by Western Water Assessment and Mountain Studies Institute, Durango, CO, April.
- Régnière, J., Bentz, B.J., Powell, J., and Nealis, V. 2013. Climate change, physiological responses, and insect pest distributions. Invited presentation in the Section Symposium: Climate Change and Arthropod Pest Dynamics: Research to Accelerate our Science and Inform Public Policy at the 61<sup>st</sup> Annual Meeting of the Entomological Society of America, Austin, Texas, November 12, 2013.
- Bentz, B.J. 2012. Potential effects of changing climate on *Dendroctonus ponderosae* a widely distributed forest insect. Linkages between climate change and global insect pestilence: from theory to practice, Entomological Society of America, Knoxville, TN, November.
- Bentz, B.J. and J. Vandygriff. 2012. Monitoring mountain pine beetle life cycle timing at multiple elevations and latitudes in California. Environmental Restoration in a Changing Climate, Tahoe Science Conference, Incline Village, CA, May.

- Bentz, B.J. and J Vandygriff. 2012. Temperature, life-history traits and mountain pine beetle population success: What have we learned? Western Forest Insect Work Conference annual meeting, Plenary Session, Penticton British Columbia, Canada, March.
- DeRose, R.J., Shaw, J.D., Long, J.N. and Bentz, B.J. 2012. Predicting future spruce beetle occurrence using forest inventory and analysis data from the intermountain West. Invited 25-minute presentation in a symposium entitled: Contributed presentation at the 60<sup>th</sup> Annual Meeting of the Entomological Society of America, Knoxville, Tennessee, November 14, 2012.
- Bentz, B.J., J. Martin and G. Schen-Langenheim. 2012. Predicting mountain pine beetle demographics in a changing climate and potential influences on woodpecker foraging in the Elkhorn Mountains, MT. Future Forests Webinar series, Ecological consequences of mountain pine beetle outbreaks for habitats and populations of wildlife, RMRS. March (webinar).
- Powell, J.A. and B.J. Bentz. 2011. Emerging at the Right Time, Stopping at the Right Place, and Scaling Up the Right Way: Phenology and Differential Motility Describe Patterns of Bark Beetle Outbreak, SIAM Dynamical Systems Annual Conference, Snowbird, UT May.
- Bentz, B.J. 2011. Bark beetles in Utah forests: Who, what where. Beetles, Water and Climate: Utah bark beetle-water workshop; Western Water Assessment. December.
- Bentz, B.J. 2011. Bark beetles in Utah forests: Climate effects. Beetles, Water and Climate: Utah bark beetle-water workshop; Western Water Assessment. December.
- Powell, J.A. and B.J. Bentz. 2011. Emerging at the Right Time, Stopping at the Right Place, and Scaling Up the Right Way: Phenology and Differential Motility Describe Patterns of Bark Beetle Outbreak, SIAM Dynamical Systems Annual Conference, Snowbird, UT May 2011.
- Bentz, B.J. 2011. Red trees and black beetles: Predicting climate effects on bark beetle population success. Ecological Society of America Annual Meeting, Austin TX, August 2011.
- Bentz, B.J. and R.B. Bracewell. 2011. Reproductive Isolation and Genetic Differences among *Dendroctonus ponderosae* Populations: Why Does it Matter?, North American Forest Insect Work Conference, Portland OR, May 2011.
- Crabb, B., J. Powell and B. Bentz. 2011. Development of high-resolution pine density maps for landscape-level modeling of mountain pine beetle. North American Forest Insect Work Conference, Portland OR, May 2011. Poster presentation.
- Bracewell, R.B. and B. Bentz. 2011. The mountain pine beetle as a model of parapatric speciation? North American Forest Insect Work Conference, Portland OR, May 2011. Poster presentation.
- Bentz, B.J. Red trees and black beetles: Climate influences bark beetle population success. Ohio State University. Department of Entomology, Wooster Campus, March 2011.
- Bentz, B.J. Red trees and black beetles: Climate influences bark beetle population success. College of Science, Science UnWrapped, Utah State University, March 2011.
- Six, D.L., Moore, M., Powell, J., and Bentz, B.J. 2012. Bark beetles and fungi: Effects of climate change on symbiont community and stability. XXIV International Congress of Entomology. Daegu Korea. August 2012.
- Smith S., B. Bentz, J. Vandygriff, T. Coleman, A. Garcia, C. Jensen, and P. Maloney. 2011. Mountain pine beetle lifecycle timing at multiple elevations and latitudes in California. Society of American Foresters Annual Convention, Hawaii.
- Bentz, B.J. Bark beetles in the Intermountain West: Who, where and why. Bark beetle impacts in the Intermountain West – Redefining post-disturbance forests and management strategies: A workshop to evaluate science status, management approaches, and policy implications. Laramie, WY Oct 4, 2010.
- Bentz, B.J. Native bark beetles in the western United States: Who, where, and why. Invited presentation to Environment and Energy Committee, Council of State Governments – West, Sun Valley, ID, September 13, 2010.

- Bentz, B.J. The mountain pine beetle in western North America: Biology and implications for high-elevation forests. Invited plenary presentation, High Five: The future of high-elevation five-needle pines in North America, Missoula MT, June 29, 2010.
- Bentz, B.J. The influence of increasing temperature on mountain pine beetle outbreaks and associated tree mortality in western North America. Emerging Infectious Diseases in Response to Climate Change Conference. New York Academy of Sciences, New York City, NY, March 2, 2010.
- Bentz, B.J. Climate change and bark beetles: A focus on the southwestern U.S., Annual Forest Health Monitoring meeting. Albuquerque, NM, January 25 – 28, 2009.
- Bentz, B.J. and J. Régnière. Climate warming and cold tolerance: predictions for the mountain pine beetle. Special Symposium: Cold Case Files: Integrative Perspectives on Physiological and Molecular Responses of Insects to Low Temperature, Entomological Society of America Annual Meeting, Indianapolis, IN December 13 – 17, 2009.
- Bentz, B.J. Will the *Real* Mountain Pine Beetle Please Stand Up? Plasticity in Climate-Influenced Phenological Strategies. EarthTalks Seminar Series, The Department of Geosciences and The Entomology Department, Pennsylvania State University, November 2, 2009.
- Klepzig, K., J. Negron and B. Bentz. Vegetation management and bark beetles in the United States. Conversation with USDA Forest Service Chief Tidwell (teleconference) October 8, 2009.
- Bentz, B.J. Mountain pine beetle and climate change. Expert Witness before the Subcommittee on National Parks, Forests and Public Lands, and Subcommittee on Water and Power, Natural Resources Committee, United States House of Representatives Hearing on Mountain pine beetle – Strategies to protect the west. June 16 2009, Washington DC.
- Bentz, B.J., G. Schen, C. Boone and K. Raffa. Mountain pine beetle outbreak dynamics in high elevation forests: Influence of climate change and tree chemistry. North American Forest Ecology Workshop, Logan, UT, June 2009.
- Fettig, C. and B.J. Bentz. Climate change and bark beetles in the western United States. Conversation with USDA Forest Service Chief Kimbell (teleconference), April 8, 2009.
- Bentz, B.J. Geographic variability in mountain pine beetle fitness traits: Climate change implications. February 2, 2009. University of Utah, Salt Lake City.
- Bentz, B.J. Geographic variability in mountain pine beetle fitness traits: Climate change implications. February 6, 2009. University of Wisconsin, Madison.
- Bentz, B.J. Bark beetles and Climate Change. USDA Forest Service Region 1 Climate Change Reading Group, Missoula, MT. Presented via Video Conference. February 13, 2009.
- Bentz, B.J. The mountain pine beetle and climate change. 'For The Forest' Science Board meeting, December 11-12, 2008, Aspen CO.
- Bentz, B.J. The mountain pine beetle and temperature. Laurentian Forestry Centre, Canadian Forest Service, September 30, 2008, Quebec, Quebec, Canada.
- Bentz, B.J. Bark beetle outbreak dynamics and ecosystem effects. Expert, Senate Hearing on Bark Beetle Impacts in Colorado, May, 2008, Eagle, CO.
- Bentz, B.J. Bark beetle research in the Rocky Mountain Research Station. USDA Forest Service, Chief's Review of Rocky Mountain Research Station, March 5, 2008, Reno Nevada.
- Regniere, J. and B. Bentz. 2008. Mountain pine beetle and climate change, 19<sup>th</sup> USDA Interagency Research Forum on Invasive Species, Annapolis, MD.
- Bentz, B.J. and J. Lundquist. 2007. Bark beetles in a changing climate. Society of American Foresters, Annual Convention, Portland, OR.
- Bentz, B.J. 2007. Influence of a changing climate on western North American bark beetle species. Entomological Society of America, Annual Convention, San Diego, CA.
- Bentz, B.J. 2007. Mountain pine beetle in whitebark pine ecosystems of the Greater Yellowstone Ecosystem. Greater Yellowstone Coordinating Committee, Bozeman, MT.

- Bentz, B.J. R. Davis, and S. Hood. 2006. Bark beetle attack and brood production following wild and prescribed fire. 3<sup>rd</sup> International Fire Ecology and Management Congress, San Diego, CA, November.
- Bentz, B.J. and G. Schen-Langenheim. 2006. Critical impacts in high elevation five-needle pine ecosystems, the mountain pine beetle. Whitebark Pine: A Pacific Coast Perspective, Ashland, OR, August.
- Powell, J. and B. Bentz. 2006. Connecting phenology predictions with population growth rates for an outbreak insect. North American Forest Insect Work Conference, Asheville, NC, May.
- Bentz, B.J. 2005. Mountain pine beetle outbreaks: causes and consequences. Bark Beetle Symposium, Snowbird Resort, November 15 – 17, 2005.
- Bentz, B.J., E.M. Hansen and J.C. Vandygriff. 2004. Verbenone: The elusive silver bullet? Annual Meeting of the Entomological Society of America, Salt Lake City, UT.
- Bentz, B.J. 2004. Bark beetle population monitoring. Forest Health Monitoring Annual Meeting, Sedona, AZ.
- Bentz, B.J. and D. Endreson 2003. Evaluation of Satellite imagery for MPB detection in Idaho and Montana, Mountain Pine Beetle Symposium: Challenges and Solutions, Kelowna, British Columbia October 30-31.
- Bentz, B.J. 2002. Bark beetle population dynamics: Influences of an adaptive seasonality. Ecology Seminar Series, School of Forestry and Wildlife Biology, The University of Montana, Missoula MT.
- Six, D.L. and B.J. Bentz. 2002. Geographic and seasonal variation in fungal associates of bark beetles. Annual Meeting of the Entomological Society of America, Ft. Lauderdale, FL.
- Bentz, B.J. 2002. The mountain pine beetle: challenges and solutions. Society of American Foresters, National Convention, Winston-Salem, NC.
- Bentz, B.J. and D. Endreson. 2002. Evaluation of TM and ETM+ Imagery for estimating mountain pine beetle-caused lodgepole pine mortality: current status. Western Forest Insect Work Conference, Whitefish, MT.
- Bentz, B.J. and V. Saab. 2002. Bark beetles and woodpeckers in Nevado de Colima National Park. Secretaria De Desarrollo Rural Jalisco, Guadalajara, Jalisco, Mexico.
- Bentz, B.J., Logan, J.A., Powell, J., and E. Hanks. 2001. Modeling the impacts of temperature on mountain pine beetle population dynamics and distribution. North American Forest Insect Work Conference, Edmonton, Alberta, 14-17, May 2001.
- Bentz, B.J., J.A. Logan, and J. Powell. 2001. Mountain pine beetle population distribution: influences of an adaptive seasonality. North American Forest Insect Work Conference, Edmonton, Alberta, 14-17, May 2001.
- Bentz, B.J. 2000. Mountain pine beetle in southwestern type ponderosa pine. Western Forest Insect Work Conference, Portland, OR.
- Bentz, B.J., J. Powell, and J. Logan. 1999. Spatial modeling of the mountain pine beetle attack process, Fifth Joint Meeting of the Western International Forest Disease Work Conference and Western Forest Insect Work Conference, Breckenridge, CO, Sept. 1999.
- Long, J, B. Bentz, D. Hansen, and E. Sibbersen. Feb. 1997. Spruce beetle suppression plan on the T.W. Daniels School Forest. USU Department of Forestry seminar.
- Bentz, B.J., J.A. Logan, and J.C. Vandygriff. 1996. Ecological implications of accurate mountain pine beetle headcapsule measurements. XX International Congress of Entomology. Firenze, Italy.
- Bentz, B.J. and J. A. Powell. 1996. Spatial self-focusing and self-dissipation: strategies for mountain pine beetle survival. North American Forest Insect Work Conference, San Antonio, TX.
- Bentz, B.J. 1995. Disturbance indices and insects in forest ecosystems. Western Forest Insect Work Conference, Rapid City, SD.

- Bentz, B.J. 1993. Quantification of insect cold-hardening and winter seasonality, Entomological Society of America National Conference, Quantitative Insect Ecology Informal Conference. Indianapolis, IN
- Bentz, B.J. 1992. Decision-making aids for forest pest management. Proceedings: Western Forest Insect Work Conference, Penticton, B.C., pp 67-68.
- Bentz, B.J. 1992. Insect Seasonality and Life History Traits, Department of Biology Seminar Series, Utah State University.
- Bentz, B.J. 1990. Development of a management information system for the mountain pine beetle. Western Forest Insect Work Conference, Coeur d'Alene, ID.
- Bentz, B.J. and R.N. Coulson. 1985-86. Patterns of publications in ESA journals, Entomological Society of America National Conferences; Reno, NV 1986 and Hollywood, FL 1985.