Karl Englund
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Expertise

My expertise lies within the processing and performance of natural fiber composite materials, concentrating on applied research, material characterization, product development, and commercialization either with industrial clients, government and trade associations, or through federal and state funded projects. The path I have taken has provided me with a valuable skill set that fosters a bridge between academic fundamentals and real-world applications.

Much of my research and outreach efforts have been within the field of wood plastic composites. Eighty percent of the over 200 industrial trials and 40% of my sponsored research through state and federal grants has been involved with WPC research and development. This body of work includes research in the development of processing methods, formulation design, and performance evaluation. Other natural fiber composite work has included research and development on traditional wood composites such as particleboard and medium density fiberboard and innovative methods of pultruding wood into a composite structure.

More recently my research and extension operations have focused on the utilization of waste materials as feedstocks for composites and biofuels. My work in the field of recycling has me involved local/state government agencies, non-profit associations, and commercial industry solving problems with regard to markets, processing options, contamination, policies and procedures and education. My efforts in the area of wood-derived biofuels has included the use of waste wood products as a feedstock, development of value-added products from the waste or non-fuel residuals, and working with stakeholders throughout the biofuel supply chain.

Education

Ph.D. Civil Engineering, Washington State University, 2001

Dissertation Title: *Consolidation and Friction Mechanisms of Wood Composites and Their Influence on Pultrusion Processing.*

M.S. Wood Science, West Virginia University, 1991

Thesis Title: *A Study of Appalachian Hardwoods Treated with Waterborne Preservatives.*

B.S. Forestry, West Virginia University, 1988

Wood Industries Emphasis

Work Experience

Chief Technology Officer, Global Fiberglass Solutions, Inc. Bothell, WA 2017-present.

Associate Research Professor, Department of Civil and Environmental Engineering, and Composite Materials and Engineering Center, Washington State University, Pullman, WA. 2014-present.

Assistant Research Professor and Extension Specialist, Department of Civil and Environmental Engineering, and Composite Materials and Engineering Center, Washington State University, Pullman, WA. 2007- 2014.

Responsibilities: Fundamental and applied research interest in composite processing and the use of waste and recycled materials. Maintaining funded research through state and federal grants and industrial service center contracts. Supporting and advising graduate students and providing employment for technical staff and undergraduate research assistants. Appointment is 50% Extension and 50% Research.

Research Engineer, Composite Materials and Engineering Center, Washington State University, Pullman, WA. 2003- 2007.

Responsibilities: Commercialization of extruded wood/thermoplastic composites, bio and synthetic composite research with industrial clients, supervising undergraduate and international intern research associates.

Post Doctorate Fellow, Composite Materials and Engineering Center**,** Washington State University, Pullman, WA. 2001- 2003.

Responsibilities: Research projects with wood-plastic composites, biofibers, and biopolymer composites.

Graduate Research Assistant, Department of Civil and Environmental Engineering, Washington State University, Pullman, WA 1996-2001.

Responsibilities: Performed a variety of research projects with wood-based composites such as; creep of wood/plastic lumber, thermoplastic modifiers in OSB and pultrusion of wood-based composites.

Research Assistant, Department of Wood Science and Technology West Virginia University, Morgantown, WV 1994-1995.

Responsibilities: Oversaw research projects utilizing nondestructive evaluation, timber bridge manufacturing and inorganic/wood fiber composites.

Plant Technical Director/Quality Control Supervisor, Weyerhaeuser (formerly Trus Joist MacMillan) – Parallam Plant, Colbert, GA 1992-1994.

Responsibilities: Supervised the QC lab, established code approval for new products, supervised and performed mill trials, and provided technical assistance to everyday plant operations.

Publications

(** Indicates graduate student supervised by Dr. Englund)*

Refereed

1. Rodin H G, Nassiri A, Englund KR, Li H, and OM Fokran. 2018. Recycled Glass Fiber Reinforced Polymer Composites Incorporated in Mortar for Improved Mechanical Performance Construction & Building Materials. Construction & Building Materials 187:738-751
2. Dumroese KR, Pinto JR, Heiskanen J, Tervahauta A, McBurney KG, Page-Dumroese DS, **Englund KR.** 2018. Biochar can be a suitable replacement for Sphagnum peat in nursery production of Pinus seedlings. Forests 9(232):1-21.
3. Seyed HM, Li H, **Englund KR**, and A Tavousi. 2018. Recycled wind turbine blades as a feedstock for second generation composites. Waste Management. 76:708-714.
4. Rodin H, Rangelov M, Nassiri S, and **KR Englund**. 2018. Enhancing mechanical properties of pervious concrete using carbon fiber composite reinforcement. J of Materials in Civil Engineering. 30(3):
5. Islam R. Pedrow PD, and **KR Englund**. 2017. Phenomenology of Corona Discharge in Helium Admixtures inside a Point-to-Point Electrode Geometry. IEEE Transactions on Plasma Science. 45(10): 1-9.
6. Islam R. Pedrow PD, Xie S, and **KR Englund**. 2017. Point-to-Point Corona Discharge in Admixtures of Argon, Oxygen, and Acetylene. IEEE Transactions on Plasma Sci. 43(10): 3695-3701.
7. Bodur MS, **Englund KR**, and M Bakkal. 2017. Water absorption behavior and kinetics of glass fiber / waste cotton fabric hybrid composites. J of Applied Polymer Sci. DOI: 10.1002/app.45506.
8. Islam R. Pedrow PD, Xie S, and **KR Englund**. 2017. Surface modifications of wood fibers using atmospheric pressure corona-based weakly ionized plasma. J of Thermoplastic Composites. DOI: 10.1177/0892705717729019.
9. Islam R. Xie S, **KR Englund** and PD Pedrow. 2017. Plasma Polymerized Acetylene Deposition Using a Return Corona Enhanced Plasma Reactor. Plasma Science and Technology 19(8):7pgs.
10. Pandey P, Bajwa SG, Bajwa DS, and **KR Englund**. 2017. Performance of UV weathered HDPE composites containing hull fiber from DDGS and corn grain. Industrial Crops & Products http://dx.doi.org/10.1016/j.indcrop.2017.06.050
11. Bodur MS, Bakkal M, and **KR Englund**. 2016. Experimental study on the glass fiber/waste cotton fabric-reinforced hybrid composites: Mechanical and rheological investigations. J. of Composite Materials. DOI: 10.1177/0021998316685897.
12. Li H. and **KR Englund**. 2016. Recycling of carbon fiber-reinforced thermoplastic composite wastes from the aerospace industry. J. of Composite Materials. 51(9): 1265-1273.

13. Rangelov M, Nassiri S, Haselbach L, and **KR Englund**. 2016 Using Carbon Fiber Composites for Reinforcing Pervious Concrete, Journal of Construction and Building Materials, 126:875-885.
14. Pereira-Ferraz G, Frear C, Pelaez-Samaniego MR, **Englund KR**, and M Garcia-Perez. 2016. Hot water extraction of anaerobic digested dairy fiber for wood plastic composite manufacturing. BioRes. 11(4):8139-8154.
15. Ogah, AO, and **KR Englund**. 2016. Thermal, mechanical and rheological properties of agro fiber filled high density polyethylene biocomposites. Int. J. of Chem and Mat Res 4(2):10-21.
16. Pelaez-Samaniego MR, and **KR Englund** 2016. Construction and demolition wood waste for sugars production via enzymatic hydrolysis. Waste and Biomass Valorization. 8(3): 883-892.
17. Ogah AO, NI Elom, SO Ngele, PA Nwofe, PE Agbo, and **KR Englund**. 2015 Water Absorption, Thickness Swelling and Rheological Properties of Agro Fibers/HDPE Composites. IOSR Journal of Polymer and Textile Engineering 2(3):66-73.
18. Lekobou WL*, **Englund KR**, Laborie MP, and PD Pedrow. 2015. Influence of atmospheric pressure plasma treatments on the surface properties of ligno-cellulosic substrates. Holzforschung. 70(1):55-62.
19. Pelaez-Samaniego MR, Yadama, V, Garcia-Perez M, Lowell E, Zhu R, and **KR Englund**. 2014. Interrelationship between lignin-rich hot water extracts of wood fiber and thermoplastic resin. Holzforschung 70(1): 31-38.
20. Ogah, AO, Afiukwa, JN and **KR Englund**. 2014. Characterization and comparison of thermal stability of agro wastes fibers in bio-composites application. J. of Chemical Eng, and Chemistry Research 1(2):84-93.
21. **Englund, KR** and LW Chen*. 2014. The rheology and extrusion processing performance of wood/melamine composites. J. of Applied Polymer Science 131(3).
22. Chi, H.* and **KR Englund**. 2014. Interfacial properties of magnesium phosphate ceramics and sugar maple (*Acer saccharum*). Holzforschung 68(5):575-582.
23. Sahaf*, A, MP Laborie, **KR Englund**, M Garcia-Perez, and AG McDonald. 2013. Rheological properties and tunable thermoplasticity of phenolic rich fraction of pyrolysis bio-oil. Biomacromolecules 14(4):1132-1139.
24. Kazemi-Najafi, S. and **KR Englund**. 2013. Effect of highly degraded high density polyethylene (HDPE) on processing and mechanical properties of wood flour-HDPE composites. J Applied Poly. Sci. 129(6):3404-3410.
25. Alam, AM, Yadama, V, Cofer, WC and **KR Englund**. 2012. Analysis and evaluation of a fruit bin for apples. J. of Food Sci. and Tech. DOI:10.1007/s13197-012-0889-3.
26. Gindl-Altmutter, W. Keckes, J. Plackner, J. Liebner, F. **Englund, KR.** Laborie, MP. 2012. All-cellulose composites prepared from flax and lyocell fibres compared to epoxy-matrix composites. Composites Sci and Tech. 72:1304-1309.

27. Sahaf* A, **KR Englund**, and MP Laborie 2011.Tack and shear strength of hybrid adhesive systems made of phenol formaldehyde, dextrin and fish glue, and acrylic pressure-sensitive adhesive. Holzforschung 66(1):73-78.

28. Migneault S., A.Koubaa, F.Erchiqui, A.Chaala, **Englund**, **KR.** C.Krause, M.P.Wolcott 2011. Application of micromechanical models to tensile properties of wood–plastic composites. Wood Sci. and Tech. 45(3):521-532.

29. Dumerose, R.K., J. Heiskanen, **KR Englund**, and A. Tervahauta. 2011. Pelleted biochar: chemical and physical properties show potential use as a substrate in container nurseries. Biomass and Bioenergy 35:2018-2027.

30. Kaboorani, A. and **KR Englund.** 2011. Water sorption and mechanical performance of preheated wood/thermoplastic composites. Journal of Composite Materials 45(13):1423-1433.

31. **Englund, KR** and V. Villechevrolle*. 2010. Flexure and water sorption properties of wood thermoplastic composites (WPCs) made with polymer blends. J. of Applied Polymer Science. 120(2):1034-1039.

32. Chang, F.C, F. Lam, and **K.R. Englund**. 2010. Feasibility of using mountain pine beetle attacked wood to produce wood-plastic composites. Wood and Fiber Science 42(3):388-397.

33. Migneault S., A.Koubaa, F.Erchiqui, A.Chaala, **K.R.Englund**, C.Krause, M.P.Wolcott 2008. Effect of fiber length on processing and properties of extruded wood fiber/ HDPE composites. J. Applied Polymer Sci. 110(2):1085-1092

34. Migneault S., A.Koubaa, F.Erchiqui, A.Chaala, **K.R.Englund**, C.Krause, M.P.Wolcott 2009. Effect of Processing Method and Fiber Size on the Microstructure and Properties of Wood-Plastic Composites. Composites Part A-Applied Science and Manufacturing. 40(1):80-85.

35. Coats E.R., F.J.Loge, M.P.Wolcott, **K.R.Englund**, A.G.McDonald. 2008. Production of natural fiber reinforced thermoplastic composites through the use of polyhydroxybutyrate-rich biomass. Bioresource Technology 99(7):2680-2686.

36. Migneault S., A.Koubaa, F.Erchiqui, A.Chaala, **K.R.Englund**, C.Krause, M.P.Wolcott 2008. Effect of Fiber Length on Processing and Properties of Extruded Wood-Fiber/ HDPE Composites. J. Applied Polymer Science. 110(2):1085-1092.

37. **Englund, K.R.** 2008. Hybrid Poplar as a Feedstock for Wood Plastic Composites. Forest Products Journal 58(5):61-65

38. Coats, E.R., F.J. Loge, M.P. Wolcott, **K.R. Englund**, and A.G. McDonald. 2007. Synthesis of Polyhydroxyalkanoates in Municipal Wastewater Treatment. Water Environment Research. 79(12):2396-2403.

39. Long, J., M.P. Wolcott, J. Zhang, and **K.R Englund**. 2007. Flexural Properties of Surface Reinforced Wood/Plastic Deck Board. Polymer Engineering and Science. 47:281-288.

40. Schirp, A, F.J. Loge, **K.R. Englund**, M.P. Wolcott, J.R Hess, T.P. Houghton, J.A. Lacey, and D.N. Thompson. 2006. Pilot-scale production and material properties of extruded

straw-plastic composites based on untreated and fungal-treated wheat straw. Forest Products Journal 56(10):90-96.

41. **Englund, K.R**. and M.P. Wolcott. 2005. Friction of non-woven wood/polypropylene fiber mats on heated steel platens. Journal of Thermoplastic Composite Materials, vol. 18(2): 95-105.
42. **Englund, K.R**., M.P. Wolcott and J.C Hermanson. 2004. The compression of wood/thermoplastic fiber mats during consolidation. Composites Part A: Applied Science and Manufacturing. 35 (2): 273-279.
43. Wang, X.P., R.J. Ross, D.W. Green, B. Brashaw, **K.R. Englund** and M. Wolcott. 2004. Stress wave sorting of red maple logs for structural quality. Wood Science and Technology. 37(6):531-537.

Patents

1. **Englund KR**, Li H, and D Lilly. Recycled composite materials and related methods. Patent App No. 62/408,971. 10/17/2016
2. Walter JC, and **KR Englund**. Carbonized component-based fuel pellet. US Patent No. 20160145519. 5/26/2016.
3. Pedrow PD, Islam R, **Englund KR**, and S Xie. Point-to-point corona discharge in admixtures of inert gas, oxygen, dry air, and acetylene. US Patent App. No. 15/154,185. 5/13/2016
4. Lekobou WP, **Englund KR**, Pedrow PD, Wemlinger EC, and R Islam. Systems and methods for treating material surfaces. US Patent No. 20160056020. 2/25/2016

Book Chapters

Englund, K.R. and M.P Wolcott. 2008. Extrusion processing of WPC's. *In*: Wood Polymer Composites. Woodhead Publishing Limited. Cambridge, UK

Proceedings/Non-Refereed

1. Fisher K, Blair L, **Englund K**, Nassiri S, Zhang K, Li H, Liu Y, Rodin III H, Rangelov M, Stark J, Erwin T, Bembenek R, and J Oricki. Permeable Pavement Enhanced with Cured Carbon Fiber Composite Material (CCFCM). Stormcon 2017. August 28-31, 2017 Seattle, WA
2. Bodur MS, Bakkal M, and **KR Englund**. Glass Fiber/Waste Cotton Fabric Reinforced Hybrid Composites: Mechanical Investigations. 2016 International Conference on Functional Materials and Metallurgy (ICFMM 2016). Oct. 26-29, 2016 Savannah, GA
3. Page-Dumroese DS, Anderson NM, Windell KN, **Englund KR**, and K Jump. 2016. Development and Use of a Commercial- Scale Biochar Spreader USDA Forest Service GTR RMRS-GTR-354.

4. P. Pedrow, W. Lekobou, E. Wemlinger, **KR Englund**, and M. P. Laborie, Cold atmospheric pressure plasma polymerization of hexamethyldisiloxane for improved wood plastics composites. *Bulletin of the American Physical Society*, vol. 55, 2010.
5. Yadama V., **Englund K.R.**, Taylor,A., Harper,D.P and J.Kim. 2009. Wood Plastic Composites - A Primer. University of Tennessee Extension Publication
6. **Englund, K.R.** and B.D. Olson. 2007. Extrusion rate influences on the mechanical and physical properties of WPC's. Proceedings for the 9th International Conference on Wood and Biofiber Composites. Madison, WI. May 2004.
7. Harper D.P., T. Rials, W. Griffith, **K.R. Englund,** and M. P. Wolcott**.** Electron-beam curable additives for WPC's. Proceedings for the 9th International Conference on Wood and Biofiber Composites. Madison, WI. May 2007.
8. Wolcott, M.P., P.M. Smith and **K.R. Englund**. 2006. Technology and market issues driving wood-plastic product development. Wood Design Focus – Journal of Contemporary Wood Engineering 16(3):3-5.
9. Soucy, J., A. Koubaa, F. Erchiqui, **K.R. Englund** and M. Wolcott. 2006. Rheometer Torque Properties of Thermoplastic Composites Filled with Different Pulp Fibers. In: Proceedings of the 22 Annual Meeting of Polymer Processing Society (PPS 22), Yamagata, Japan, July 2-6.
10. Fabiyi, J.S., A.G. McDonald, M.P. Wolcott and **K.R. Englund**. 2006. Understanding the Chemistry of Wood Plastic Composites Weathering. In: Proceedings of Progress in Woodfibre-Plastic Composites Conference 2006, Toronto, Canada, May 1-2. 10pp.
11. Wolcott, M.P**.,** D. Harper and **K.R. Englund**. 2003. Molecular relaxations contributing to phase transition creep in thermoplastic wood composites. In: Proceedings of the Seventh International Conference on Woodfiber-Plastic Composites. Forest Products Society, Madison, WI, May 19-20. p. 95.
12. **Englund, K.R.** and M.P. Wolcott. 2002. Pultrusion manufacturing for the wood composites industry. Small Diameter Timber: Resource Management, Manufacturing and Markets. Washington State University Cooperative Extension. Pullman, WA. pp 227-230.
13. Wolcott, M.P and **K.R. Englund**. 1999. Wood thermoplastic composites. Proceedings of the International Particleboard/Composite Materials Symposium. Washington State University, Pullman, WA. 103-112pp.
14. **Englund, K.R.** and D.J. Gardner 1993. A study of chromated copper arsenate preservative treatment in selected Appalachian hardwoods. Chromium containing waterborne preservatives: Fixation and environmental issues. J. Winandy and M. Barnes eds. Forest Products Society, Madison, WI. pp36-40.

Presentations

Oral Presentations *(*presenter)*

1. **KR Englund***. 2018. Recycling Wind Turbine Blades into Next Generation Value-added Products. Advances in Wind Energy. Boulder, CO. 6/5/18.

2. **KR Englund***. 2018. Wind Turbine Blade Recycling. The Composites Recycling Conference. Knoxville, TN 4/11/18.
3. **KR Englund***, Nassiri S, Zhang K, Li H, Fischer K*, Blair L, Stark J, Erwin T, and A Jayakaran. 2017. Permeable Pavement Enhanced with Cured Carbon Fiber Composite Material (CCFCM). Stormcon2017. Bellevue, WA 8/29/17.
4. **KR Englund**, Li H, Xin J, and J Zhang. 2017. Composites Recycling at WSU: Research and Product Development. WRED Event, Port Angeles, WA 7/27/17.
5. **KR Englund*** Li H, and D Lilly. 2017. Creating an economically viable industry for recycling wind turbine blades. 51st Pacific Northwest Regional Economic Conference Bend, OR May 23-25.
6. Tarlton T*. and **KR Englund** 2017. Rheology of Wood Plastic Composites for Increased Range of Production Methods. Advancements in Fiber-Polymer Composites Symposium. Madison WI. 5/18/17.
7. **KR Englund*** 2017. Development of composites from recycled wind turbine blades. Spokane Innovator Network (SINE(f2)). Spokane, WA 4/19/17.
8. **KR Englund*** and T Tarlton. 2016. Water and WPCs….an ongoing saga. Composite Lumber Manufacturing Association Annual Meeting. Madison, WI Nov 10, 2016.
9. Tarlton, T and ***KR Englund**. Rheological and performance evaluation of styrene based wood plastic composites. Profiles 2016. Philadelphia, PA June 28-29, 2016.
10. Pelaez Samaniego, MR, ***Englund KR**, and G Schneider. Wood waste from MSW/C&D as a biofuel feedstock 2nd Northwest Wood-Based Biofuels + Co-Products Conference. Seattle, WA May 3-4, 2016.
11. *Bergman R, Gu H, Windell K, Zhang H, and **KR Englund.** Estimating GHG Emissions from the Manufacturing of Field-Applied Biochar Pellets. 2016 Society of Wood Science and Technology. March 6-11 Curitiba, Brazil
12. ***KR Englund**, and D Lilly. Creating a supply chain for recycled wind turbine blades. ACMA's Green Composites Council Recycling Committee meeting. Dallas, TX. October 27, 2015.
13. Lekobou, W. ***Englund, KR,** MP Laborie and PD Pedrow. Hydrophobic wood particles developed from atmospheric cold plasma polymerization. 49th International Wood Composite Symposium. Seattle, WA. April 21-22, 2015
14. ***Englund, KR.** Case Revealed Presentation: Recycling plastics. WSU's Global Case Competition. Pullman, WA. February 23, 2015.
15. ***Englund, KR.** The Recycling Dilemma – What to make from our trash**.** WSU Common Reading Series. Pullman, WA. March 24, 2015.
16. ***Englund, KR**, Wolcott, MP, and Cavelier, R. NARA Overview. Western Development Committee – Forestry. Richland, WA August 20, 2014.
17. Lekobou, W. ***Englund, KR,** MP Laborie and PD Pedrow. Changing the surface of wood with atmospheric plasma polymerization. 10th Congress for Biobased Materials, Natural Fibers and WPC**.** Stuttgart, Germany. June 24 2014.
18. ***Englund, KR.** 2013. Waste Wood and Plastics: Where does/can it all go? UI President's Sustainability Symposium. North Idaho College - Coeur d'Alene, ID March 20.

19. ***Englund, KR.** 2012. CMEC Carpet Research. Washington State Recycling Association Meeting - In the Loop: The NW Carpet Recycling Value Chain. Kent, WA. June 21, 2012.
20. Sahaf A, ***Englund KR**, Laborie, MP, Garcia-Perez M, and A. McDonald. 2012. Pyrolytic Lignins as a Thermoplastic Resin for Wood Composites. 47th International Wood Composite Symposium. Seattle, WA. April 11-12.
21. *Sahaf A, **Englund, KR**, Laborie, MP, Garcia-Perez M, and A. McDonald. Thermoplastics from pyrolytic lignin. 243rd ACS National Meeting & Exposition, March 2011. San Diego, CA.
22. *Laborie MP, Sahaf A, **Englund, KR**, Garcia-Perez M, and A McDonald. Pyrolytic Lignin with tunable Thermoplasticity. International Conference on Bio-based Materials and Composites (ICBMC'12), Feb. 22-24, 2012. Marrakech-Morocco.
23. *Lekobou, W., **Englund, KR**, Pedrow, PD, & Scudiero, L. 2011. Atmospheric pressure cold plasma treatment of cellulose based fillers for wood plastic composites. Gaseous Electronics Conference, Salt lake City, UT.
24. Englund, KR and LW Chen. 2011. The Use of Thermoplastic Processing Methods for Wood-Thermoset Composites. WSU MME Symposium Series, Pullman, WA April 28.
25. *Dumroese RK, Pinto JR, Heiskanen J, **Englund KR.** 2010. Potential for using biochar in container media used to grow native plants. Fifth Western Native Plant Conference. December 7-9. Western Forestry and Conservation Association. Portland, Oregon.
26. ***Englund, KR**, M Garcia-Perez, MP Laborie. 2010. A forest-based pyrolysis biorefinery. Western Sun Grant Annual Meeting. Vancouver, WA October 13.
27. *Yadama, V. and ***K.R. Englund**, 2010. Adding value to Washington's biomass. WSU Webinar Series. 8/3/2010.
28. Cameron, T.C., ***K.R. Englund**, V. Yadama, and V. Barber. 2010. Combined temperature and UV influences on the mechanical performance of WPCs 11th International Conference on Biocomposites: Transition to Green Materials. Toronto, CA May 2-4.
29. ***Englund K.R.** and Z. Rininger. 2009. Profiled wood composites using pultrusion processing. 63rd International Forest Products Society Annual Meeting. Boise, ID June 21-23.
30. Kaboorani A, Cloutier A, ***Englund KR**, and MP Wolcott. 2009. Characterizing Water Sorption and Diffusion Properties of Wood/Plastic Composites as a Function of Formulation Design. 10th International Conference on Wood & Biofiber Plastic Composites May 11–12, Madison, Wi

31. ***Englund KR**. 2008. Magnesium-phosphate binders for wood fiber composites. 9th Pacific Rim Bio-Based Composite Symposium. Rotorua, NZ Nov. 8-10.

32. ***Englund KR** and PM Smith. 2008. Trends in the WPC Market. American Wood Preservers Association Annual Meeting. Portland, OR May 19-20.

33. ***Englund KR.** 2008. Alternative fibers for wood plastic composites. Smallwood 2008 and Bioenergy & Wood Products. Madison, WI May 13-15.

34. ***Englund KR.** and Z Rininger. 2008. Novel pultrusion processing for wood composites. International Wood Composite Symposium - Technical Workshop. Seattle, WA. March 31, 2008.

35. ***Englund KR.** and BD Olson. 2007. Extrusion rate influences on the mechanical and physical properties of WPC's. 9th International Conference on Wood and Biofiber Composites. Madison, WI. May 21-22.

36. *Harper DP, T Rials, W Griffith, **KR Englund,** and MP Wolcott**.** 2007. Electron-beam curable additives for WPC's. 9th International Conference on Wood and Biofiber Composites. Madison, WI. May 21-22.

37. *Tichy R and **KR Englund.** 2006. Product Performance Assessment of Wood and Natural Fiber-Polymer Composites. Durability in Wood Plastic and Natural Fiber Composites. San Antonio, TX . December 4-5.

38. *Fabiyi JS, A McDonald, MP Wolcott, and **KR Englund.** 2006. Understanding the Chemistry of Wood Plastic Composites Weathering. Progress in Wood and Bio Fibre Plastic Composites. Toronto, Canada. May 1-2.

39. Yadama,V,* **KR Englund** and R Vagaan. 2006. Sawmill Residues for Wood-Plastic Composites. Progress in Wood and Bio Fibre Plastic Composites. Toronto, Canada. May 1-2.

40. ***Englund, KR** and Michael P. Wolcott. 2005 WPC Processing and Formulations. International Wood Composite Symposium. Pullman, WA. April.

41. ***Englund, KR** and Michael P. Wolcott. 2004. Wood Thermoplastic Composites – Manufacturing and Performance. UC Cooperative Extension – Durability Seminar Series Durable Decks: Construction, Degradation, and Inspection. November 10.

42. ***Englund, KR**. 2004. Wheat straw residues as a fibers source for thermoplastic composites. Progress in Wood and Bio Fibre Plastic Composites Conference. Toronto, CA. May 10-11.

43. *Coats, E., ***KR Englund**, F Loge and MP Wolcott. 2003. *Wood fiber-PHB composites*. AIChE Annual Meeting, San Francisco, CA, November.

44. *Wolcott, MP**, KR Englund**, DP Harper and TQ Li. 2003. Influence of additives on the viscoelastic and rheological behavior of wood-polypropylene composites. AIChE Annual Meeting, San Francisco, CA, November 16-21

45. *Harper, DP, MP Wolcott and **KR Englund**. 2003. Molecular relaxations contributing to phase transition creep in thermoplastic wood composites. 7th International Conference on Woodfiber-Plastic Composites. Madison, WI, May 19-20.

46. ***KR Englund** and MP Wolcott. 2002. The pultrusion of wood-based composites. Small Diameter Timber Symposium. Spokane, WA. February 25-27.

47. *Wolcott, MP and **KR Englund.** 1999. A technology review for wood-plastic composites. 33rd International Particleboard/Composite Materials Symposium Proceedings. Washington State University, Pullman, WA, April 13-15.

48. ***Englund, KR** and MP Wolcott. 1996. The use of synthetic gypsum as an inorganic binder in waste-paper fiberboard. 50th Annual Meeting of the Forest Products Society. Minneapolis, MN.

Posters

1. Mamanpush, SH, Tabatabaei AT, and **KR Englund** 2017. Recycling of Carbon Fiber Reinforced Thermoset Composite Wastes from the Aerospace Industry. JCATI Symposium. Seattle, WA 4/4/17
2. Li, H, Mamanpush, SH, and **KR Englund** 2016. Recycling of Carbon Fiber Reinforced Thermoplastic Composite Wastes from the Aerospace Industry. WSU Sustainability Fair, Pullman, WA Oct 19.
3. Li, H, and **KR Englund**. 2015. Recycling and repurposing of carbon fiber reinforced thermoplastic scraps and end-of-life wind turbine blades. Clean Tech Showcase. Seattle, WA. June 22.
4. Cochran A, Brooks R, McDonald A, Keefe R, and **K Englund**. 2015. Small Scale Pellet Production as Alternative Bioenergy from Forest Residuals. National Extension Energy Summit, Seattle WA. April 7-9.
5. Zhang H, and **KR Englund**. 2015. Use of energetic parameters to understand the compaction behavior of biochar and Douglas fir residuals. International Wood Composite Symposium. Seattle, WA April 21-22.
6. Zhu, R., Yadama, V. and **KR Englund**. 2013. From Wood to Wing: NARA Works to Harness Woody Biomass for Aviation Biofuel. Small Log Conference. Coeur d'Alene, ID 3/13-15
7. Lekobou, W. KR **Englund**, and P Pedrow. 2013. Atmospheric Pressure Plasma Treatment of Cellulose Based Fillers for Improved Plastic Composites. International Wood Composite Symposium. Seattle, WA April 3-4.
8. Sahaf, A. and KR **Englund**. 2013. Characterization of Thermoplastic Blends of Phenolic Rich Fraction of Wood Pyrolysis Oil and Biopolymers for Adhesive Application . International Wood Composite Symposium. Seattle, WA April 3-4.
9. Schneider, GA and **KR Englund** 2013. Wood Waste Assessment within the Construction and Demolition Industry. International Wood Composite Symposium. Seattle, WA April 3-4.
10. Islam, R. W Lekobou, E Wemlinger, **KR Englund**, and P Pedrow. 2013. Transport of Neutral Radicals to Substrate Surfaces Located Downstream from an Atmospheric Pressure Weakly Ionized Plasma Reactor. WSU Academic Showcase Pullman, WA. March 29.

11. Chi, H. and **KR Englund**. 2012. Interfacial Properties of Chemically Bonded Phosphate Ceramics and Wood. International Wood Composite Symposium. Seattle, WA April 11-12.
12. Sahaf, A. and **KR Englund**. 2011. Thermoplastic Behavior in Phenolic Rich Phase Derived from Pyrolytic Bio-Oil, WSU Academic Showcase, March 25, Washington State University.
13. Gray, R, Lekobou W, Pedrow, P and **KR Englund**. 2011. Plasma Polymerization Deposition Rate Study within an Atomospheric Pressure Cold Plasma Reactor. NSF REU Poster Presentation. Aug 5 . Pullman,WA.
14. Sahaf, A., MP Laborie and **KR Englund**. 2010. A study of PF based hybrid adhesives for value-added wood composites. 44th International Wood Composite Symposium. Seattle, WA Mar. 29-31.
15. Cameron, T.C., * V. Yadama, **KR Englund**, and V. Barber. 2010. Coupled weathering effects on strength, stiffness, and creep behavior of wood-plastic composites. 64th Annual Conference of the Forest Products Society.
16. Benjamin, MJ, **KR Englund**, and D.F. Bahr. 2010. Material properties of chemically bonded phosphate ceramic/wood interfaces. Research Experience for Undergraduates Poster Session Washington State University NSF REU Program. Aug. 6, 2010.
17. Migneault S, Koubaa A, Erchiqui F, Chaala A, **Englund KR**, and MP Wolcott. 2010. Modeling the tensile properties of wood-plastic composites made from CTMP hardwood fibers. 11th International Conference on Biocomposites: Transition to Green Materials, Toronto, CA May 2-4, 2010.
18. **Englund, KR** and V Yadama. 2009. CMEC Wood and Natural Fiber Research. 2nd Annual Family Forest Expo. Auburn, WA Feb. 13, 2010.
19. Lekobou, W, Pedrow, **Englund, KR** and MP Laborie. 2009. Cold-atmospheric pressure plasma polymerization of acetylene on wood flour for improved wood plastics composites. 62nd Gaseous Electronics Conference. Saratoga Springs, NY Oct. 20-23, 2009.
20. Rininger, ZR, and **KR Englund**. 2008. Pultrusion of Wood Strand Composites. Northwest Forest Products Academic Forum. Tacoma, WA May 16, 2008.
21. Chen, LW and **KR Englund**. 2008. Extrudable melamine resins for WPC's. 43rd International Wood Composite Symposium. Seattle, WA Mar. 31-April 1.

Industrial Outreach and Engagement

($1,600,000+ in research and development projects from the following selected list of clients)

AERT
Arch Chemicals
Arclin
Armstrong Global Industries
BASF
BioFrontiers Inc.
Boise Cascade Inc.
C.F. Martin Guitar
Canyon Creek Cabinetry
Ciba Specialty Chemicals
Chemtura Chemicals
Ceramic Cement Corp
Creafil Fibers
Deceunick
Dow Chemical
Dow Corning
Dupont Corporation
Edeniq
Elk Composites
Equistar Chemicals
Epoch Composites
Evergreen Engineering
Fiberon
FiberTech
Fusoni
Georgia-Pacific Corp
Geo Chemicals

Global EcoVentures	Lubrizol	Pacific Tool	Styrolution America LLC
Hearthstone	Masonite Corp	Polymer Engineering Co.	Traision Corp
Hollow Road Farms	McFarland Cascade	Polyone	Trex
Honeywell	MeadWestvaco	Rexam	Tricon Timber
Huntsman Polyurethanes	Milacron	Rio Tinto Minerals	Troy Chemicals
ICMI	Momentive	Sartomer	USFS
Jeldwen	Neville Chemicals	ScreenTight	Vagaan Bros. Lumber
JER Environtech	New Page Inc.	Setzer Forest Products	WAPS - Korea
Johns Manville	NewWood	Simplot	Waste-Not Recycling
Kescon	Office Max	Strandex	Weyerhaeuser Corp.
Louisiana-Pacific Corp.	Osmose	Straw Xchange	Zemex

Sponsored Research

*Personally expended in ( )

Englund, KR, Nassir, S. and K Zhung. Optimization of Strength of Permeable Pavement Enhanced with Cured Carbon Fiber Composite Material (CCFCM). 2016. $ 129,805 ($47,867).

Englund KR. Styrolution Inc. Wood modified styrenics. 2014-2017. ($257,125)

Englund KR. JCATI. Integration of recycled thermoplastic and thermoset based carbon fiber reinforced composites into value-added composites. 2016-2017 ($74,696).

Englund KR. Global Fiberglass Solutions. Recycled Fiberglass composites for novel new products. 2016-2017 (101,454).

Stark, J. **Englund, KR**, Hasselbach, L, Nassir, S. and H Wen. Scrap FRP composites for reinforcing pervious pavements. Boeing Corporation 8/15-12/15 $213,800 ($42,760).

Holzer, A,…(4 other co-PIs).. **KR Englund**. Mid Columbian Economic Development District. Investing in Manufacturing Community Partnerships. 2013-2015. $80,000 ($10,075)

Englund KR. JCATI. Recycling of Carbon Fiber Reinforced Thermoplastic Composite Wastes for the Aerospace Industry. 2013-2014 ($72,540)

Englund KR. Terra Power. Biochar pellets. 2014. ($15,000)

Anderson, N (11 other co-PIs)… **KR Englund**. USDA. Integration of biofuels and bioproducts production into forest products supply chains using modular biomass gasification and carbon activation. 2011-2015. $6,946,631($244,328)

Wolcott MP (18 other WSU co-PIs)… **KR Englund**. USDA: PMU: Northwest Advanced Renewables Alliance (NARA): A New Vista for Green Fuels, Chemicals, and Environmentally Preferred Products (EPPs). 2011-2013. $23,600,000 ($412,795).

Englund, KR., Laborie, MP, and M. Garcia-Perez. Sun Grant – OSU. *A Forest Residue-Based Pyrolysis Biorefinery*. 2009-2012. $179,547 ($101,936*)*

Bender D, Yadama V, **Englund, KR**. USDA CSREES-Wood Utilization Research Program. *Panelized wood assemblies*. USDA Wood Utilization Research Program 2009 – 2011 $190,000 ($60,000)

Yadama, V. and **KR Englund.** U. Alaska –Fairbanks. Wood-Plastic Composites from Low-value Alaskan Biomass and Blends of Recycled Thermoplastics. $50,461 ($25,230)

Dumerose, D. Dumerose, K., and **KR Englund**. USDA-FS *Using Fast-pyrolysis Biochar to Develop Pellets for Application to Forest Soils*. 2009-2011. ($25,000) Sub-contract award.

Laborie, MP. and **KR Englund**. Boeing. *Eco-Friendly Epoxy Resins Using Cellulose Nanocrystals.* 2009. $49,000.

Bender, Donald (PI); **Englund, KR**; Yadama, V.; Laborie, M., Zhang, J. USDA CSREES-Wood Utilization Research Program. *Value-Added Wood-Strand Composites*. USDA CSREES-Wood Utilization Research Program 2008-2010 $195,190 ($48,798)

Yadama, V. and K.R. Englund. Univ. of Alaska-Fairbanks. *Alaskan timber resources for wood-plastic composites: a feasibility study.* 2007-2009. $47,386 ($15,795)

Englund, K.R. Washington Technology Center. *Modified wood fillers for improving wood plastic composites.* 2005-2006 ; $120,849.

Englund, K.R. and V. Yadama. USDA CSREES-Wood Utilization Research Program. *Small diameter trees for long strand composites.* 2006-2008; $194,996.

Yadama, V., **K.R. Englund**, and R.J. Tichy. Washington Technology Center. *Business expansion for an eastern Washington sawmill – environmentally appropriate wood plastic composites*. 2006; $98,950 (Co)PI. ($22,104)

K.R. Englund. USDA CSREES-Wood Utilization Research Program. *Wood Thermoplastic Composites for Bridge Decking*. 2004-2006; $48,000.

Yadama, V. and **K.R. Englund**. Washington Technology Center. *Sawmill residues for wood plastic composites.* 2004-2005; $48,365. (Co)PI. ($24,157 personally expended)

Englund, K.R. and M.P. Wolcott. Washington Technology Center. *Extrusion of foamed polyvinyl chloride/wood flour composites.* 2005; $43,174.

Student Advising and Mentoring

Chair or Co-Chair

Mamanpush, Seyed Hossein PhD 2019 *(Projected)* Mechanical and Materials Engineering. Topic: Recycled carbon and fiberglass composites

Tarlton, Thomas PhD 2018*(projected)* Material Science and Engineering Program. Topic: Processing wood-filled styrenics.

Zhang, Hanwen PhD 2016. Material Science and Engineering Program. Topic: Modeling the pelletization of biochar.

- Journal article - Zhang H, and **KR Englund.** 2016. Influences of temperature and feed constituents addition on the compaction and extrusion processes of biochar pelletization. J of Biomass and Bioenergy *(in review)*
- Presentation - Zhang H, and **KR Englund**. 2015. Use of energetic parameters to understand the compaction behavior of biochar and Douglas fir residuals. International Wood Composite Symposium. Seattle, WA April 21-22.

William Lekobou Ph.D. 2013. Material Science and Engineering Program. Topic: Atmospheric pressure plasma polymerization of wood veneer and particles.

- Journal article - Lekobou WL*, **Englund KR**, Laborie MP, and PD Pedrow. 2015. Influence of atmospheric pressure plasma treatments on the surface properties of ligno-cellulosic substrates. Holzforschung. 70(1):55-62.
- Proceedings - P. Pedrow, W. Lekobou, E. Wemlinger, **K. Englund**, and M. P. Laborie, Cold atmospheric pressure plasma polymerization of hexamethyldisiloxane for improved wood plastics composites. *Bulletin of the American Physical Society*, vol. 55, 2010.
- Presentation –
    - Lekobou, W., **Englund, KR**, Pedrow, PD, & Scudiero, L. Atmospheric pressure cold plasma treatment of cellulose based fillers for wood plastic composites. Gaseous Electronics Conference, Salt lake City, UT. 2011
    - Lekobou, W. **Englund, KR,** MP Laborie and PD Pedrow. Changing the surface of wood with atmospheric plasma polymerization. 10th Congress for Biobased Materials, Natural Fibers and WPC**.** Stuttgart, Germany. June 24 2014.
- Employment – Process Research Engineer, Intel, Portland, OR.

Amir Sahaf Ph.D. 2013. Material Science and Engineering Program. Topic: Phenolic fractions of pyrolytic bio-oil for use as thermo-responsive adhesives

- Journal articles –
    - Sahaf A**, K.R. Englund**, and MP Laborie 2011.Tack and shear strength of hybrid adhesive systems made of phenol formaldehyde, dextrin and fish glue, and acrylic pressure-sensitive adhesive. Holzforschung 66(1):73-78.
    - Sahaf, A, MP Laborie, **KR Englund**, M Garcia-Perez, and AG McDonald. 2013. Rheological properties and tunable thermoplasticity of phenolic rich fraction of pyrolysis bio-oil. Biomacromolecules 14(4):1132-1139.
- Presentations
    - Sahaf A, **Englund KR**, Laborie, MP, Garcia-Perez M, and A. McDonald. 2012. Pyrolytic Lignins as a Thermoplastic Resin for Wood Composites. 47th International Wood Composite Symposium. Seattle, WA. April 11-12.
    - Sahaf A, **Englund, KR**, Laborie, MP, Garcia-Perez M, and A. McDonald. Thermoplastics from pyrolytic lignin. 243rd ACS National Meeting & Exposition, March 2011. San Diego, CA.
    - Laborie MP, Sahaf A, **Englund, KR**, Garcia-Perez M, and A McDonald. Pyrolytic Lignin with tunable Thermoplasticity. International Conference on Bio-based Materials and Composites (ICBMC'12), Feb. 22-24, 2012. Marrakech-Morocco.
- Employment – Bechtel Houston, TX

Schneider, Gerald MS, 2013. Civil and Environmental Engineering. Thesis: *Construction and demolition wood waste assessment for the Northwest US.*

- Employment - Nautilus Building Consultants, San Diego, CA

Chi, Hengxuan MS, 2012. Mechanical and Materials Engineering. Thesis: *Interfacial properties of chemical bonded phosphates ceramics and sugar maple (Acer saccharum).*

- Journal article - Hengxaun, C. and KR Englund. Interfacial properties of magnesium phosphate ceramics and sugar maple (Acer saccharum). Holzforschung – accepted

- Employment – Materials Engineer at Ran Business LLC Rowling Heights, CA

Xiaoming Wen MS 2012. Civil and Environmental Engineering. Project: *Performance of extruded wood plastic composites from fire-killed black spruce and blends of virgin and recycled polyolefins*.

Tony Cameron MS 2009. Civil and Environmental Engineering. Thesis: Alaskan timber resources for wood plastic composites.

- Presentation – Cameron, T.C., *K.R. Englund, V. Yadama, and V. Barber. 2010. Combined temperature and UV influences on the mechanical performance of WPCs 11th International Conference on Biocomposites: Transition to Green Materials. Toronto, CA May 2-4.
- Employment – Naval Shipyards, Everett, WA

Leewen Chen MS 2009. Civil and Environmental Engineering. Thesis: *Extrudable melamine resin for wood plastic composites.*

- Journal Article - Englund, KR and LW Chen. 2013. The rheology and extrusion processing performance of wood/melamine composites. J. of Applied Polymer Science 131(3).
- Presentation - Englund, KR and LW Chen. 2011. The Use of Thermoplastic Processing Methods for Wood-Thermoset Composites. WSU MME Symposium Series, Pullman, WA April 28.

Viviane Villechevrolle MS 2008. Civil and Environmental Engineering. Thesis: *Polymer Blends for multi-extruded wood plastic composites.*

- Journal Article - Englund, K.R. and V. Villechevrolle. 2010. Flexure and water sorption properties of wood thermoplastic composites (WPCs) made with polymer blends. J. of Applied Polymer Science. 120(2):1034-1039.
- Employment – Structural Engineer at Eiffage Construction Haute Normandie Le Petit Quevilly, France

Zachary Rininger MS 2008. Civil and Environmental Engineering. Thesis: *The utilization of small diameter timbers in pultruded long strand composites.*

- Presentations –
    - Englund K.R. and Z. Rininger. 2008. Novel pultrusion processing for wood composites. International Wood Composite Symposium - Technical Workshop. Seattle, WA. March 31, 2008.
    - Englund K.R. and Z. Rininger. 2009. Profiled wood composites using pultrusion processing. 63rd International Forest Products Society Annual Meeting. Boise, ID June 21-23.
- Employment - Structural Engineer at Nelson Engineering Kenai, Aslaska

Other Graduate student advisory committees served:

Jian Geng (MS in MSE ’11-“13)
Shan Li (MS in MME ’11-‘13)

Shuai Zhou (PhD in BSE ‘10-’13)
Anselm Ogah (visiting scholar - PhD Polymer Science Ebonyi State University – Nigeria ’12)
Rhui Zhang (PhD in CE (’11-’14)
Nils Peterson (M.S. in CE) (’07-’08)
Jason O’Dell (MS in CE) (‘06-‘08)
Christopher Voth (MS in CE) (’07-’09)
Yang Cao (MS in CE) (‘08-’10)
Gregory Estep (MS in CE) (’09-’10)
Kevin Simmons (PhD in MSP (‘08-’11)
Meng Hsin Tsai (PhD in CE ‘08-‘12)
Mehmet Safa Bodur (visiting scholar - PhD from Istanbul Technical University – Turkey)

Undergraduate Mentoring

Research Interns

Calvin Silas (MME) (’13) – NARA Student Undergraduate Research Experience (SURE)
Mary Blevins (Ch E) (’12) – WSU Cougar Undergraduate Research Experience (CURE)
Roderick Gray (MS – Alabama Tech) (’11) – NSF Research Experience for Undergraduates (REU)
Anthony Timms (CE) (’08-’09) – WSU CURE
Michael Benjamin (CE) (’10) – NSF REU
Edward Spicer (CE) (’09-’10) – Entrepreneurial Program

Senior Thesis

Milosh Mededovic (MSE ’12-’13)
David MacDonald (MSE ’08-’09)
Erik Walker (AS ’11-12)
Euginia Lo (AS ’11-12)

International interns supervised :

Johannes Plackner (05/09 -08/09)
Harish Kumar *(05/09 – 08/09)*
Emmanuel Stapfer *(05/06-08/06)*
Laurant Cossart *(05/06-08/06)*
Rajaneerom Bannavittayakit *(3/04-7/04)*
Rutchanop Pojanavaraphan *(3/04-7/04)*

Undergraduate research assistants supervised (27):

Zachary Andrews
Michael Benjamin
Mary Blevins
Tony Cameron
Brian Entman
Karl Frazier
John Fuerstein
Benjamin Grimes
Caleb Knudsen
Chad Kuntz
Christian Kure
Andrew Langdon
Milosh Mededovic
David MacDonald
Stephanie Pitts
Ben Rhodes
Zachary Rininger
Ryan Roberts
Sarah Schwab
David Shapiro
Michael Smith
Edward Spicer
Jesse Taylor
Nathan Troll
Elliot Troll
Jonathon Waldrip
James Van Wingerden
Michael Voth
Zachary Wright

Post Doctoral Supervision

Manuel Raul Pelaez-Samaniego (2015)

Primary research; Conversion of wood wastes from C&D waste streams into liquid biofuels

Hui Li (2015-present)

Primary research: Use of recovered materials to manufacture and evaluate recycled composites.

Professional Society Memberships

Washington State Recycling Association
Washington Extension Agents and Specialist Association
NW By-Product Synergy
King County Carpet Recovery Program
Forest Products Society
Society of Wood Science and Technology
Society of Plastics Engineering
Building Materials Reuse Association
ASTM

Professional Service

Advisory Board Member

- King County Solid Waste Carpet Recovery Program 2012-2013
- Composites Advisory Committee, Peninsula College 2013

Conference Session Planning

- American Chemical Society, Building Materials Reuse Association, Forest products Society, WSU-International Wood Composite Symposium

Committee Assignments

- WSU Budget Advisory Council 2010-2011
- Washington State Recycling Association - Education Committee 2012-present
- Ferry County Extension Search Committee 2013
- Technical Research Associate- Composites Search Committee 2007

Panel Reviewer

- National Science Foundation
  - Small Business Innovative Research (4x's)
  - Materials Processing and Manufacturing
- USDA, Swiss NSF, NSCERC,WSU Seed Grant, Christian Doppler, TWAS
  - Ad hoc reviewer

Adjunct Faculty Position

- WSU Mechanical and Materials Engineering
- WSU Material Science Program

Visiting Sponsorship

- Faculty
  - Ibrahim Al-Hamarneh, Al-Balqa Applied University, Jordan
  - Saeed Kazemi Najafi - Tarbiat Modares University Noor, Iran
- Graduate Student
  - Anselm Ogah (PhD Polymer Science Ebonyi State University – Nigeria '12)

Conference Session Moderator

- American Chemical Society, Building Materials Reuse Association, Forest products Society, WSU-International Wood Composite Symposium

Technical Consultant/Advisor

- Network for Business Innovation and Sustainability. 2010-present
- King County Solid Waste Carpet Recovery Program 2009-present

Technical Reviewer

- Journals
  - Forest Products J, Composites Part A, J of Applied Polymer Sci, J of Thermoplastic Composite Materials, Wood and Fiber Science, J of Zhejiang University – Science B, Materials Today, J of Polymers and the Environment, Bioresources, Maderas, Thermochimica Acta, Tribiology Transactions, J Wood Chemistry and Technology, European Polymer J, Fuel Processing Technology, J of Biobased Materials and Bioenergy, J of Composite Materials
- Granting Agency
  - Ontario Research Fund, National Science Foundation, USDA, The World Academy of Sciences

WSU Service

- Committees
  - Intellectual Property Committee
    - Chair 2018-present
    - Co-chair 2017-2018
- Co-organizer
  - Future City 2016-present
- Judge/Reviewer
  - Imagine Tomorrow
  - WSU Academic Showcase
  - Auvil Scholarships
- Teaching
  - CE 580 – Graduate Seminar – 2012, 2015, 2017
  - CE 547 – Natural Fiber Thermoplastic Composites – 2007

- Engineering Entrepreneurship Program, College of Engineering and Architecture. 2004 -2009
  - 1-day workshop
- Presented workshops for 4-H K-12 students on recycling materials – 2013-present
- CE 466 FE Review course – Materials 2013-preent (2 x's per year)