

**Karl Englund**  
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## ***Expertise***

My expertise lies within the processing and performance of natural fiber and recycled feedstocks for 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.

Recently, my research and extension operations have focused on the utilization of waste materials as feedstocks for composites, bioenergy, and cross laminated timbers (CLT). 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. This work has led me to a Chief Technology Officer part-time position with a glass fiber composite recycling manufacture, Global Fiberglass Solutions. I also continue to perform applied research and development for the CLT industry.

## ***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***

**Research Professor**, Department of Civil and Environmental Engineering, and Composite Materials and Engineering Center, Washington State University, Pullman, WA. 2022-present.

**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. 2014-2022.

**Assistant Research Professor and Extension Specialist**, Department of Civil and Environmental Engineering, and Composite Materials and Engineering Center, Washington State University, Pullman, WA. 2008-2014.

*Responsibilities:* Fundamental and applied research interest in composite processing and the use of waste and recycled materials. Maintaining funded research sponsored grants and 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 III**, 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 directly supervised by Dr. Englund)

### **Refereed**

1. Adeniran, AT\*, **Englund KR**, H Li, and JW Kim. 2025. Influence of Borate Chemical Treatment on Adhesive Bond Performance of Douglas fir and grand fir Laminates. *European J of Wood and Wood Products*. *Accepted*
2. Adeniran, AT\*, **Englund KR**, H Li, and Silva do Carmo, DP. 2024. Influence of laminate twist and clamping pressure on bonding performance of low-grade lumber in cross laminated timber. *Forest Products J*. 74 (3): 242–250.
3. Hatt JP\*, **Englund KR**, and H Li. 2024. Performing Poly (Ethylene Terephthalate) Glycolysis in a Torque Rheometer Using Decreasing Temperatures. *Technology Innovation for the Circular Economy: Recycling, Remanufacturing, Design, Systems Analysis and Logistics*. Pg 407-420.
4. Sarpong KA, Adesina FA\*, DeVetter LW, Zhang K, DeWhitt K, **Englund KR**, and Miles CA. 2024. Recycling agricultural plastic mulch: limitations and opportunities in the United States. *Circular Agricultural Systems 4*: e005 doi: 10.48130/cas-0024-0003
5. Silva do Carmo, DP\*, **Englund KR**, and H Li. 2023. Pressure mapping and susceptibility to bonding failure for low-quality lamstock in cross laminated timber. *Case Studies in Construction Materials*. 2/14/23. doi.org/10.1016/j.cscm.2023.e01933
6. Hatt JP\*, **Englund KR** and H Li. 2023. Characterizing the changes to the material properties of a bottle-grade poly(ethylene terephthalate) subject to repeated melt extrusion. *J of Applied Polymer Science*. 140(13) doi.org/10.1002/app.53676
7. Silva do Carmo, DP\*, **Englund KR**, and H Li. 2022. Pressure prediction model in cross laminated timber manufacturing for low-quality lumber. *J. of Composite Materials*. 56(27) DOI: 10.1177/00219983221127008
8. Madrid B, Wortman S, Hayes DG, DeBruyn JM, Miles C, Flury M, Marsh TL, Galinato SP, **Englund K**, Agehara S, and LW DeVetter. 2022. End-of-Life Management Options for Agricultural Mulch Films in the United States—A Review. *Front. Sustain. Food Syst*. 6:921496. doi: 10.3389/fsufs.2022.921496.
9. Bergman R, Sahoo K, **Englund KR**, and SH Mousavi-Avval. 2022. Techno-economic analysis and life cycle assessment of biochar pellet production from forest residues and field application. *Energies* 15(1559).
10. Nassiri S, Al Shareedah O, Rodin, H. and **KR Englund**. 2021. Mechanical and Durability Characteristics of Pervious Concrete Reinforced with Mechanically Recycled Carbon Fiber Composite Materials. *Materials and Structures*. 54(107):30p
11. Seyed HM\*, Li H, Tavousi A and **KR Englund**. 2021. Heterogeneous thermoset/thermoplastic recycled carbon fiber composite materials for second-generation composites. *Waste and Biomass Valorization* 38. doi.org/10.1007/s12649-021-01341-0.
12. Zhang K, Liu Y, Nassiri S, Li H, and **KR Englund**. 2021. Performance Evaluation of Porous Asphalt Mixture Enhanced with High Dosages of Cured Carbon Fiber Composite Materials. *Construction and Building Materials* 274(2):122066.

13. Haider MM, Nassiri S, **Englund KR**, Li H, and Z Chen. 2021. Exploratory Study of Flexural Performance of Mechanically Recycled Glass Fiber Reinforced Polymer Shreds as Reinforcement in Cement Mortar. *J. of the Transportation Research Board*. doi.org/10.1177%2F03611981211015246.
14. Rangelov M, Nassiri S, and **KR Englund**. 2020. Life cycle assessment of pervious concrete pavements reinforced by recycled carbon fiber composite elements. *Pavement, Roadway, and Bridge Life Cycle Assessment 2020. Proceedings of the International Symposium on Pavement, Roadway, and Bridge Life Cycle Assessment 2020*. 11pp. (Peer-reviewed). Sacramento, CA, June 3-6.
15. Shuzheng X, Pedrow PD, and **KR Englund**. 2020. Cold Plasma Processing of Biochar Using Corona Discharge in Atmospheric Pressure Dry Air and Helium. *IEEE Transactions on Plasma Science* 48(7):2457-2463.
16. Zhang K, Lim J, Nassiri S, Al Shareedah O, Li H, and **KR Englund**. 2020. Field pilot study of porous asphalt pavement reinforced by cured carbon fiber composite materials (CCFCMs). *International Journal of Pavement Engineering*. DOI:10.1080/10298436.2020.1774765.
17. Zhang K, Lim J, Nassiri S, **Englund KR**, and H Li. 2019 Reuse of Carbon Fiber Composite Materials in Porous Hot Mix Asphalt to Enhance Strength and Durability. *Construction & Building Materials*. 11:e00260.
18. Seyed HM\*, Li H, **Englund KR**, and A Tavousi. 2019. Extruded fiber-reinforced composites manufactured from recycled wind turbine blade material. *Waste and Biomass Valorization*. 11:3853-3862.
19. Nassiri S, Li H, **Englund KR**, Al Shareedah O, Chen Z. 2019. Field Performance Evaluation of Pervious Concrete Pavement Reinforced with Novel Discrete Reinforcement. *Case Studies in Construction Materials* 10(open access).
20. Rodin H G, Nassiri S, **Englund KR**, Li H, and OM Fakran. 2018. Recycled Glass Fiber Reinforced Polymer Composites Incorporated in Mortar for Improved Mechanical Performance *Construction & Building Materials*. *Construction & Building Materials* 187:738-751
21. 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.
22. 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.
23. 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).
24. Islam R, Pedrow PD, Xie S, and **KR Englund**. 2018. Surface modifications of wood fibers using atmospheric pressure corona-based weakly ionized plasma. *J of Thermoplastic Composites*. 31(7): 946-958.

25. 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.
26. 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.
27. 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.
28. 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.
29. 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*. 107(15): 409-414.
30. 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.
31. 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.
32. 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.
33. 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.
34. 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.
35. Pelaez-Samaniego MR, and **KR Englund** 2016. Production of Sugars from Wood Waste Materials Via Enzymatic Hydrolysis. *Waste and Biomass Valorization*. 8(3): 883-892.
36. Lekobou WL\*, **Englund KR**, Laborie MP, and PD Pedrow. 2016. Influence of atmospheric pressure plasma treatments on the surface properties of ligno-cellulosic substrates. *Holzforschung*. 70(1):55-61.
37. 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.
38. Pelaez-Samaniego MR, Yadama, V, Garcia-Perez M, Lowell E, Zhu R, and **KR Englund**. 2014. Interrelationship between lignin-rich dichloromethane extracts of hot

water-treated wood fibers and high-density polyethylene (HDPE) in wood plastic composite (WPC) production. *Holzforschung* 70(1): 31-38.

39. 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.
40. **Englund, KR** and LW Chen\*. 2014. The rheology and extrusion processing performance of wood/melamine composites. *J. of Applied Polymer Science* 131(3).
41. Chi, H.\* and **KR Englund**. 2014. Interfacial properties of magnesium phosphate ceramics and sugar maple (*Acer saccharum*). *Holzforschung* 68(5):575-582.
42. 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.
43. 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.
44. 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.
45. Gindl-Altmatter, 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.
46. 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.
47. 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.
48. 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.
49. Kaboorani, A. and **KR Englund**. 2011. Water sorption and mechanical performance of preheated wood/thermoplastic composites. *Journal of Composite Materials* 45(13):1423-1433.
50. **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.
51. 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.
52. 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.

53. 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
54. 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.
55. 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.
56. **Englund, K.R.** 2008. Hybrid Poplar as a Feedstock for Wood Plastic Composites. *Forest Products Journal* 58(5):61-65
57. 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.
58. 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.
59. Schirp, A, F.J. Loge, **KR 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.
60. **Englund KR**, 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.
61. **Englund KR**, 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.
62. Houghton TP, Thompson DN, Hess RJ, Lacey JA, Wolcott MP, Schrip A, **Englund KR**, Dostal D, and F Loge. 2004. Fungal Upgrading of Wheat Straw for Straw-Thermoplastics Production. *Applied Biochemistry and Biotechnology* 113:71-93.
63. 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. Taeye DA, Nassiri S, **Englund KR**, Zhang K and JY Lim. Permeable pavement system including a permeable pavement composition and a related method. US Patent #11807578B2 11/7/23.

2. **Englund KR**, Nassiri S, Haselbach LM, Li H, Wen H, and K Fischer. Permeable pavement and cured carbon fiber composition and a related method. US Patent App No. 15/639678. 6/30/17.
3. **Englund KR**, Li H, and D Lilly. Recycled composite materials and related methods. Patent App No. 62/408,971. 10/17/2016
4. Walter JC, and **KR Englund**. Carbonized component-based fuel pellet. US Patent No. 20160145519. 5/26/2016.
5. 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
6. 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

Li H, and **KR Englund**. 2024. Synthetic Fiber Composite Recycling *In:ASM Handbook on Composites*. ASM H-2024-0029.R1. *Accepted, in process*

**Englund KR**, and MP Wolcott. 2008. Extrusion processing of WPC's. *In: Wood Polymer Composites*. Woodhead Publishing Limited. Cambridge, UK

### Proceedings/Non-Refereed

1. Seyed HM\*, Li H, Tavousi A and **KR Englund**. 2023. The impact of wood fibers in composite panels made from recycled fiberglass wind turbine blades. Research Square. doi.org/10.21203/rs.3.rs-1772341/v1
2. Fisher K, Blair L, **Englund KR**, 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
3. 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
4. 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.
5. 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.
6. Yadama V., **Englund K.R.**, Taylor,A., Harper,D.P and J.Kim. 2009. Wood Plastic Composites - A Primer. University of Tennessee Extension Publication

7. **Englund, K.R.** and B.D. Olson. 2007. Extrusion rate influences on the mechanical and physical properties of WPC's. Proceedings for the 9<sup>th</sup> International Conference on Wood and Biofiber Composites. Madison, WI. May 2004.
8. Harper D.P., T. Rials, W. Griffith, **K.R. Englund**, and M. P. Wolcott. Electron-beam curable additives for WPC's. Proceedings for the 9<sup>th</sup> International Conference on Wood and Biofiber Composites. Madison, WI. May 2007.
9. 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.
10. 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.
11. 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.
12. 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.
13. **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.
14. 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.
15. **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. Adesina F, **Englund KR\*** and H Li. Mulch Feedstock Preparation and Initial Properties. The 7<sup>th</sup> Agricultural Plastics Recycling Conference & Trade Show (APRC), August 14-16, 2024.
2. Adeniran AT\*, **Englund KR**, Li H, Llyod J, and JW Kim. 2024 Influence of borate chemical treatment on bond strength of Douglas fir and grand fir laminates. Forest Product Society International Convention, Knoxville, TN June 4-5, 2024.

3. Grieves RB\*, **Englund KR**, Li H, and G Cheng. 2024. The Effect of Fiber Morphological Properties and Composition on MDF Performance Forest Product Society International Convention, Knoxville, TN June 4-5, 2024.
4. **KR Englund\***, Li H, Chen Z, and J Zhang. 2023. Recycling Thermosets – What WSU has done for us lately. Recycling Development Committee Meeting. Kent, WA. 6/14/23.
5. **KR Englund\***, Li H, and Z Chen. 2023. Recycled synthetic (thermoset) composites as fillers for the plastics industry. Functional Fillers Conference. Philadelphia, PA 5/17/23
6. **KR Englund\*** 2023. Recent Developments within CLT and Mass Timber. NorthWest Construction Consumer Council. 4/26/23. Virtual Online.
7. Li H\*, Hatt J, Ju J, **Englund KR**, and B Olson. 2022. Characterizing cure behavior of 1C-PUR adhesive by DMA - Part I. International Conference on Wood Adhesives. Portland, OR. 5/12/22.
8. **KR Englund\*** 2021. Recycled Fiberglass Composites for Thermoplastic Compounds. RACE Americas, 10/8/22.
9. **KR Englund\*** 2021. The Mass timber movement. LEAP Update 2021. UI Extension. 3/4/21
10. \*Rangelov M. Nassiri S. and **KR Englund**. 2021 Life Cycle Assessment (LCA) of Pervious Concrete Pavements Reinforced by Recycled Carbon Fiber Composite Elements. LCA 2020. Online January 13-15.
11. **KR Englund\*** 2020. Feedstocks for the next generation of composites. Zero Waste Innovation Hackathon. Online 11/30/20.
12. **KR Englund\*** 2019. Providing a viable pathway for recycling composites. JCATI Symposium. Seattle, WA 4/11/19.
13. **KR Englund\*** 2019. Supply Chain Development for Cross Laminated Timber. UI CNR Seminar Series. Moscow, ID 1/23/19
14. **KR Englund\*** 2019. Cross Laminated Timber - A New Market for Forest Products. 27<sup>th</sup> Family Foresters Workshop. Spokane, WA 1/18/19
15. **KR Englund\*** 2018. Developing a Value Chain for Recycling Wind Turbine Blades. Clean Tech Innovation Showcase 2018. Seattle, WA. 6/25/18.
16. **KR Englund\***. 2018. Recycling Wind Turbine Blades into Next Generation Value-added Products. DOE - Advances in Wind Energy. Boulder, CO. 6/5/18.
17. **KR Englund\***. 2018. Wind Turbine Blade Recycling. The Composites Recycling Conference. Knoxville, TN 4/11/18.
18. **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.
19. **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.

20. **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.
21. 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.
22. **KR Englund\*** 2017. Development of composites from recycled wind turbine blades. Spokane Innovator Network (SINE(f2)). Spokane, WA 4/19/17.
23. **KR Englund\*** and T Tarlton. 2016. Water and WPCs....an ongoing saga. Composite Lumber Manufacturing Association Annual Meeting. Madison, WI Nov 10, 2016.
24. Tarlton, T and **\*KR Englund**. Rheological and performance evaluation of styrene based wood plastic composites. Profiles 2016. Philadelphia, PA June 28-29, 2016.
25. 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.
26. **\*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
27. **\*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.
28. Lekobou, W. **\*Englund, KR**, MP Laborie and PD Pedrow. Hydrophobic wood particles developed from atmospheric cold plasma polymerization. 49<sup>th</sup> International Wood Composite Symposium. Seattle, WA. April 21-22, 2015
29. **\*Englund, KR**. Case Revealed Presentation: Recycling plastics. WSU's Global Case Competition. Pullman, WA. February 23, 2015.
30. **\*Englund, KR**. The Recycling Dilemma – What to make from our trash. WSU Common Reading Series. Pullman, WA. March 24, 2015.
31. **\*Englund, KR**, Wolcott, MP, and Cavelier, R. NARA Overview. Western Development Committee – Forestry. Richland, WA August 20, 2014.
32. Lekobou, W. **\*Englund, KR**, MP Laborie and PD Pedrow. Changing the surface of wood with atmospheric plasma polymerization. 10<sup>th</sup> Congress for Biobased Materials, Natural Fibers and WPC. Stuttgart, Germany. June 24 2014.
33. **\*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.
34. **\*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.
35. Sahaf A, **\*Englund KR**, Laborie, MP, Garcia-Perez M, and A. McDonald. 2012. Pyrolytic Lignins as a Thermoplastic Resin for Wood Composites. 47<sup>th</sup> International Wood Composite Symposium. Seattle, WA. April 11-12.

36. \*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.
37. \*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.
38. \*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.
39. Englund, KR and LW Chen. 2011. The Use of Thermoplastic Processing Methods for Wood-Thermoset Composites. WSU MME Symposium Series, Pullman, WA April 28.
40. \*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.
41. **\*Englund, KR**, M Garcia-Perez, MP Laborie. 2010. A forest-based pyrolysis biorefinery. Western Sun Grant Annual Meeting. Vancouver, WA October 13.
42. \*Yadama, V. and **\*K.R. Englund**, 2010. Adding value to Washington's biomass. WSU Webinar Series. 8/3/2010.
43. Cameron, T.C., **\*K.R. Englund**, V. Yadama, and V. Barber. 2010. Combined temperature and UV influences on the mechanical performance of WPCs 11<sup>th</sup> International Conference on Biocomposites: Transition to Green Materials. Toronto, CA May 2-4.
44. **\*Englund K.R.** and Z. Rininger. 2009. Profiled wood composites using pultrusion processing. 63<sup>rd</sup> International Forest Products Society Annual Meeting. Boise, ID June 21-23.
45. 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
46. \*Englund KR. 2008. Magnesium-phosphate binders for wood fiber composites. 9<sup>th</sup> Pacific Rim Bio-Based Composite Symposium. Rotorua, NZ Nov. 8-10.
47. \*Englund KR and PM Smith. 2008. Trends in the WPC Market. American Wood Preservers Association Annual Meeting. Portland, OR May 19-20.
48. \*Englund KR. 2008. Alternative fibers for wood plastic composites. **Smallwood 2008 and Bioenergy & Wood Products**. Madison, WI May 13-15.
49. **\*Englund KR**. and Z Rininger. 2008. Novel pultrusion processing for wood composites. International Wood Composite Symposium - Technical Workshop. Seattle, WA. March 31, 2008.
50. **\*Englund KR**. and BD Olson. 2007. Extrusion rate influences on the mechanical and physical properties of WPC's. 9<sup>th</sup> International Conference on Wood and Biofiber Composites. Madison, WI. May 21-22.

51. \*Harper DP, T Rials, W Griffith, **KR Englund**, and MP Wolcott. 2007. Electron-beam curable additives for WPC's. 9<sup>th</sup> International Conference on Wood and Biofiber Composites. Madison, WI. May 21-22.
52. \*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.
53. \*Fabiya 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.
54. 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.
55. \***Englund, KR** and Michael P. Wolcott. 2005 WPC Processing and Formulations. International Wood Composite Symposium. Pullman, WA. April.
56. \***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.
57. \***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.
58. \*Coats, E., \***KR Englund**, F Loge and MP Wolcott. 2003. *Wood fiber-PHB composites*. AIChE Annual Meeting, San Francisco, CA, November.
59. \*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
60. \*Harper, DP, MP Wolcott and **KR Englund**. 2003. Molecular relaxations contributing to phase transition creep in thermoplastic wood composites. 7<sup>th</sup> International Conference on Woodfiber-Plastic Composites. Madison, WI, May 19-20.
61. \***KR Englund** and MP Wolcott. 2002. The pultrusion of wood-based composites. Small Diameter Timber Symposium. Spokane, WA. February 25-27.
62. \*Wolcott, MP and **KR Englund**. 1999. A technology review for wood-plastic composites. 33<sup>rd</sup> International Particleboard/Composite Materials Symposium Proceedings. Washington State University, Pullman, WA, April 13-15.
63. \***Englund, KR** and MP Wolcott. 1996. The use of synthetic gypsum as an inorganic binder in waste-paper fiberboard. 50<sup>th</sup> Annual Meeting of the Forest Products Society. Minneapolis, MN.

### **Posters**

1. Rasmussen K, **Englund KR**, and H Li. 2024. Recycling Aerospace Carbon Fiber Composites and Waste Plastics into Value-added Composites. SAMPE 2024 Long Beach, CA 5/22/24.

2. Adeniran AT, **Englund KR**, and H Li. 2024. Influence of Borate Chemical Treatment on Bond Strength of Douglas Fir and Grand Fir Laminates. WSU Academic Showcase, Pullman, WA 3/27/24.
3. Rasmussen K, **Englund KR**, and H Li. 2024. Recycling Aerospace Carbon Fiber Composites and Waste Plastics into Value-added Composites. WSU Academic Showcase, Pullman, WA 3/27/24.
4. Zhang K, Lim J, Nassiri S, AlShareedah O, Li H, and KR Englund, 2020. Reinforcing Porous Asphalt Using Cured Carbon Fiber Composite Materials. Transportation Research Board Annual Meeting January 2020.
5. 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
6. 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.
7. 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.
8. 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.
9. 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.
10. 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
11. 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.
12. 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.
13. Schneider, GA and **KR Englund** 2013. Wood Waste Assessment within the Construction and Demolition Industry. International Wood Composite Symposium. Seattle, WA April 3-4.
14. 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.

15. Chi, H. and **KR Englund**. 2012. Interfacial Properties of Chemically Bonded Phosphate Ceramics and Wood. International Wood Composite Symposium. Seattle, WA April 11-12.
16. 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.
17. Gray, R, Lekobou W, Pedrow, P and **KR Englund**. 2011. Plasma Polymerization Deposition Rate Study within an Atmospheric Pressure Cold Plasma Reactor. NSF REU Poster Presentation. Aug 5 . Pullman,WA.
18. Sahaf, A., MP Laborie and **KR Englund**. 2010. A study of PF based hybrid adhesives for value-added wood composites. 44<sup>th</sup> International Wood Composite Symposium. Seattle, WA Mar. 29-31.
19. Cameron, T.C., \* V. Yadama, **KR Englund**, and V. Barber. 2010. Coupled weathering effects on strength, stiffness, and creep behavior of wood-plastic composites. 64<sup>th</sup> Annual Conference of the Forest Products Society.
20. 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.
21. 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.
22. **Englund, KR** and V Yadama. 2009. CMEC Wood and Natural Fiber Research. 2<sup>nd</sup> Annual Family Forest Expo. Auburn, WA Feb. 13, 2010.
23. Lekobou, W, Pedrow, **Englund, KR** and MP Laborie. 2009. Cold-atmospheric pressure plasma polymerization of acetylene on wood flour for improved wood plastics composites. 62<sup>nd</sup> Gaseous Electronics Conference. Saratoga Springs, NY Oct. 20-23, 2009.
24. Rininger, ZR, and **KR Englund**. 2008. Pultrusion of Wood Strand Composites. Northwest Forest Products Academic Forum. Tacoma, WA May 16, 2008.
25. Chen, LW and **KR Englund**. 2008. Extrudable melamine resins for WPC's. 43<sup>rd</sup> International Wood Composite Symposium. Seattle, WA Mar. 31-April 1.

## ***Industrial Outreach and Engagement***

*(Selected list of clients)*

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AERT	AZEK	Chemspec LTD	Dow Chemical
Arch Chemicals	BASF	Chemtura Chemicals	Dow Corning
Arclin	BioFrontiers Inc.	Ciba Specialty Chemicals	DTG Industries
Arkema	Boise Cascade Inc.	Ceramic Cement Corp	Dupont Corporation
Armstrong Global Industries	CalPlant	Creafil Fibers	Ecovative
Arauco	C.F. Martin Guitar	Deceunick	Edeniq
	Canyon Creek Cabinetry	Denton Plastics	Elk Composites

Equistar Chemicals	ICMI	Neville Chemicals	Straw Xchange
Epoch Composites	Interfacial Solutions	New Page Inc.	Styrolution America LLC
Evergreen Engineering	Jeldwen	NewWood	Sunstrand
Fiberon	JER Environtech	Office Max	Traision Corp
FiberTech	Johns Manville	Osmose	Terra Power
Fibria	Katerra	Pacific Tool	Trex
Fusoni	Kescon	Polymer Engineering Co.	Tricon Timber
General Plastics	Lignor	Polyone	Triumph Composites
Georgia-Pacific Corp	Louisiana-Pacific Corp.	Rexam	Troy Chemicals
Geo Chemicals	Lonza	Rio Tinto Minerals	USFS
Global EcoVentures	Lubrizol	Saco	Vagaan Bros. Lumber
Global Fiberglass Solutions, Inc	Masonite Corp	Sartomer	Wacker
Green Mantra	Mastermark	ScreenTight	WAPS - Korea
Hexas Biomass	McFarland Cascade	Setzer Forest Products	Waste-Not Recycling
HNI	MeadWestvaco	Silvadeck	Weyerhaeuser Corp.
Honeywell	Milacron	Simplot	Willamette Valley Co.
Huntsman Polyurethanes	Momentive	Solazyme	Wonderful Co
	The Nature Conservancy	Strandex	Zemex

## ***Sponsored Research***

\*Personally expended in ( )

**Englund KR**, and Li H. Assessment of borate-treated lamstock for a more durable CLT. USDA-NIFA. \$249,954. 2022.

**Englund KR** and Hui Li. Technical consultant . WA DOE \$55,364. 2021

Lee, Katherine, **KR Englund** and Li H. Integrated Electrochemical Reactions for Reclaiming and Modifying Carbon Fiber. DOD STTR – with Faraday Electronics. \$75,956 7/1/21-6/30/22.

**Englund KR** and Hui Li. Plastics Recycling Market Development. WA DOE \$49,629. 2021

**Englund KR** and Hui Li. Assessment of Plastic Recycling Technologies for Business Development in WA State. WA DOC \$65,909. 2021

Nassiri S, **Englund KR**. Enhanced concrete made through chemically activated waste inorganics and carpet residues derived from construction and demolition recovery. King County, WA. \$198,026 (59,407). 2020.

**Englund KR**, Li H, and V Yadama. Process Modeling for CLT using SDT Feedstocks. USDA-NIFA. \$249,169. 2019.

Devetter-Wasko L,...**KR Englund**..(11 Co-PIs). Planning Grant: Implementation of New Technologies and Improved End-of-Life Management for Sustainable Use of Agricultural Plastics. USDA-NIFA-Specialty Crops. \$49,427. 2019.

Nassiri S, **Englund KR**, and H Li. Strong and Durable Permeable Concrete Pavements using Cured Composites from Plane Manufacturing. JCATI/UW. \$52,205 (\$20,882). 2018.

Nassiri S, **Englund KR**, Zhang K, Li H. Pervious pavement project for the IDEA school in Tacoma WA. Boeing, \$100,151. 2019 (\$10,015)

**Englund, K. R.** Wood Modified Styrenics. Styrolutions, \$358,615.00. August 16, 2014 - May 16, 2019. (\$358,615).

Nassiri S, **Englund KR**, Zhang K, Li H. Demonstration Project for Cured Carbon Fiber Composite Materials (CCFCM) Reinforced Permeable Pavement. Boeing, \$154,275. February 26, 2018 - September 30, 2018. (\$55,475).

**Englund KR**, Zhang, K, Nassiri S, Demonstration Projects for Cured Carbon Fiber Composite Materials (CCFCM) Reinforced Permeable Pavement. Boeing, \$96,562.00. November 30, 2017 - March 31, 2018. (\$62,038).

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

**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). 2011-2015. \$39,600,000 (\$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 (\$24,500).

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 (\$77,998).

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)

Wolcott, MP, Loge F, Zhang JW, and **Englund KR**. Development of Renewable Microbial Polyesters for Cost Effective and Energy-Efficient Wood-Plastic Composites. US DOE 2005: \$506,381 (87,959).

**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

**Rasmussen, Katherine** MS 2025. Civil and Environmental Engineering. Topic: Recycled CFCs for composites.

**Adesina, Funmilayo** PhD 2027. Mechanical and Materials Engineering. Topic: Ag-Plastics for recycling into composites

**Greive, Brandon Riley** PhD 2027 Mechanical and Materials Engineering. Topic: Commercial waste stream analysis for MDF production.

**Aderian, Abiola** PhD 2026 Mechanical and Materials Engineering. Topic: Borate treatment for CLT

**Mamanpush, Seyed Hossein** PhD 2024 Mechanical and Materials Engineering. Topic: Recycled carbon and fiberglass composites.

- Journal articles –

- Seyed HM, Li H, Tavousi A and **KR Englund**. 2021. Heterogeneous thermoset/thermoplastic recycled carbon fiber composite materials for second-generation composites. *Waste and Biomass Valorization* 38. doi.org/10.1007/s12649-021-01341-0.

- Seyed HM, Li H, **Englund KR**, and A Tavousi. 2019. Extruded fiber-reinforced composites manufactured from recycled wind turbine blade material. *Waste and Biomass Valorization*. 11:3853-3862.

- 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.
- Presentations
  - 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
  - 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.

**Tarlton, Thomas** PhD 2021(*projected*) Material Science and Engineering Program. Topic: Processing wood-filled styrenics.

- Presentations
  - 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.
  - Tarlton, T and \***KR Englund**. Rheological and performance evaluation of styrene based wood plastic composites. Profiles 2016. Philadelphia, PA June 28-29, 2016.

**Silva Do Carmo, Dalisson** MS 2021. Civil and Environmental Engineering. Topic: Modelling press loads for CLT production of low value timber.

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

- 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. 10<sup>th</sup> 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. 47<sup>th</sup> 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. 243<sup>rd</sup> 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 11<sup>th</sup>

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. 63<sup>rd</sup> 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:

Md Mostofa Haider (CEE '20)  
Hasan Rafsan Jani (MME '19)  
Johnson Jones (CEE '19)  
Shuzheng Xie (EECS '19)  
Lang Haung (MSEP '19)  
Kevin Simmons (MSEP '18)  
Cheng Hao (MME '18)  
Xiaolong Guo (MME '17)  
Xiaojie Guo (MSEP '17)  
Yalan Liu (MSEP '16)  
Wangcheng Liu (MME '16)  
MD Rokibul Islam (EECS '16)  
Audra Cochran (UI '16)

Gabriela Pereira Ferraza (BSE '16)  
Kathryn Mireles (MME '16)  
Mehmet Safa Bodur (Turkey – '16)  
Jian Geng (MS in MSE '11-'13)  
Shan Li (MS in MME '11-'13)  
Shuai Zhou (PhD in BSE '10-'13)  
Anselm Ogah (PhD – Nigeria '12)  
Rhui Zhang (PhD in CE ('11-'14)  
Gregory Estep (MS in CE) ('09-'10)  
Aurelie Besset (CEE '11)  
Meng-Hsin Tsai (CEE '11)  
Chris Voth (CEE '09)  
Yang Cao (CEE'10)

Jason O'Dell (CEE '08)  
Steven Michael (CEE '08)

Nels Peterson (CEE '08)

## **Undergraduate Mentoring**

### Research Interns

Jacob Bowen (ME- Letourneau University) ('17) CB<sup>2</sup> REU Program  
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

Babak Seddigh (MSE '19)  
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 (38):

Reece Adams	Chad Kuntz	David Shapiro
Zachary Andrews	Christian Kure	Michael Smith
Michael Benjamin	Andrew Langdon	Edward Spicer
Mary Blevins	Milosh Mededovic	Jesse Taylor
Riley Blotteaux	David MacDonald	Nathan Troll
Tony Cameron	Kamren Moen	Elliot Troll
Ross Dombrowski	Stephanie Pitts	Jonathon Waldrip
Brian Entman	Ben Rhodes	James Van Wingerden
Karl Frazier	Zachary Rininger	Michael Voth
John Fuerstein	Ryan Roberts	Zachary Wright
Benjamin Grimes	Andrew Rust	Dustin Yates
Alexander Gagliardo	Sarah Schwab	Brandon Zirkle
Caleb Knudsen	Nicholas Selberg	

## **Post Doctoral Supervision**

*Manuel Raul Pelaez-Samaniego (2015)*

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

Hui Li (2015-2017)

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

- Recycling Development Center, WA DOE 2019-Present
  - Co-Chair 2020-present
- 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

- Washington State Recycling Association - Education Committee 2012-2016
- 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 and Engineering Program
- UI College of Natural Resources

#### 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. 2010-2013
- King County Solid Waste Carpet Recovery Program 2009-2011
- Plastic Packaging Advisory Committee 2021

#### 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, Thermochemica Acta, Tribiology Transactions, J Wood Chemistry and Technology, European Polymer J, Fuel Processing Technology, J of Biobased Materials and Bioenergy, J of Composite Materials, etc....
- Granting Agency
  - Ontario Research Fund, National Science Foundation, USDA, The World Academy of Sciences, DOE, etc....

#### WSU Service

- Committees
  - Intellectual Property Committee
    - Chair 2018-present
    - Co-chair 2017-2018
  - VCEA Budget Advisory Council
    - Invited Member – 2009-2011
- Co-organizer
  - Future City 2016-2018
- Judge/Reviewer
  - Imagine Tomorrow
  - WSU Academic Showcase
  - Auvil Scholarships
- Teaching

- CE 580 – Graduate Seminar – 2012, 2015, 2017, 2020
- 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 – 2013-2015
- CE 466 FE Review course – Materials 2013-2019 (2 x's per year)