

Annual Report



Center for Forest Products Business

Alfred P. Sloan Foundation Industry Studies Center

Department of



College of Natural Resources and Environment



Reporting Period July 1, 2018 - June 30, 2019



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August 2019

Letter from Director:

Dear Colleagues:

Hello from your Center,

It is hard to believe that another year has passed and we will soon be welcoming 175 students back to our department. Many of you have hired them for summer internships and I want to thank you for helping us with their education. The department remains committed to have our students prepared to “hit the road running” when they graduate, and your internships are vital for them getting experience in the forest products industry. We currently have one of the largest undergraduate enrollment in the department’s 40 year history. We graduated over 50 students last May, with most of them finding employment within the industry.

As you are probably aware, the new generation of student (and future employee) is somewhat different than when I started in the industry in 1974. While the baby boomer generation was interested in finding a long-term career and moving up the ladder, students today have different goals (and maybe better). They are more concerned about social responsibility, sustainability, serving society, and participating in decision making, than the bottom line on the balance sheet. They tend to stay with companies for less time and are more mobile than my generation. To help meet this changing need, the department hired a new faculty in the area of the circular economy that started this August. She will be focusing on the life-cycle analysis and recycling as it applies to the biomaterials’ industry. I share this with you to let you know we are adjusting our departments’ instructional techniques and classes to meet this new student. Our classes focus on hands-on learning techniques and team building skills so they know how to effectively work with others in a job environment. Repeatedly, when we ask employers what do students need to be successful, it is their social, leadership, communication, and organizational skills that rate higher than their technical skills to be successful in your organizations.

On a personal note, in preparation for my retirement in 2021, I am stepping down at Department Head the end of this year. There is currently a job search being conducted to find my replacement. We hope to have someone in place by January. It has been an honor to serve in this role for seven years, and now I must plan for my next adventure in life. I want to thank you for your continued support of our programs. I hope you will contact us with your needs for employees or summer interns. Many of our classes have projects and if you need a short specific project investigated, please contact me and I will see if we can work it into a class. Please feel free to contact me with any comments or suggestions to improve the program (rsmith4@vt.edu). Again, thanks for your support of our students and I wish you a successful year.

Sincerely,

Bob Smith



Participating Faculty and Staff

Robert Smith	<i>Director, Department Head and Professor</i>	rsmith4@vt.edu
Henry Quesada	<i>Assistant Director and Associate Professor</i>	quesada@vt.edu
Bob Bush	<i>Professor, Sustainable Biomaterials</i>	rbush@vt.edu
Tom Hammett	<i>Professor, Sustainable Biomaterials</i>	himal@vt.edu
Earl Kline	<i>Professor, Sustainable Biomaterials</i>	kline@vt.edu
Angela Riegel	<i>Program Specialist, Sustainable Biomaterials</i>	ariegel@vt.edu

Mission

To assist the forest products industry by improving the management of their operations and the marketing of their products.



Significant accomplishments:

Proposals Funded:

Bush, Robert J. Marketing Studies, Virginia Tech Foundation Inc., Amount awarded to date: \$1,000. 10/1/2011-9/30/2018.

Hammett, Tom. Expanding Livelihood Options for Virginia Land Owners Through Tree Syrup Production, VA Department of Agriculture, Department of Agriculture, Maximum Amount: USD 46,072, Amount Awarded to Date: \$46,072, Principal Investigators: Tom Hammett (80%), John F. Munsell (20%), 10/01/2018-09/29/2021.

Hammett, Tom. Global service support, Office of International Affairs, Amount Awarded to Date: \$40,000, 12/01/2018-01/15/2020.

Hammett, Tom. Incorporating CLT demonstration project in project-centered learning, Center for Research in Teaching and Learning, Amount Awarded to Date: \$3,000, Principal Investigators: Edge K, 01/01/2018-01/01/2019.

Hammett, Tom. Increasing Intercultural Competence Among Students in Natural Resources, USDA, McIntire-Stennis Program, Amount Awarded to Date: \$10,000, Principal Investigators: Bush R, 11/14/2018-12/15/2022.

Hammett, Tom. Service without Borders, various, Amount Awarded to Date: \$65,000, 06/01/2015 to date.

Hammett, Tom. Sustainable Production of Wood-Derived Aviation Biofuels and Co-Products, AFRI NIFA, Department of Agriculture, Proposed amount: \$1,500,000, Principal Investigators: Hammett A; Quesada H, 10/10/2018.

Kline, Earl. Forest Industries Center, Virginia Tech Foundation Inc., Maximum Amount: USD 66,404, Amount Awarded to Date: \$66,404, 03/01/2010-02/28/2020.

Kline, Earl. VTF - Nettleton Professorship, Virginia Tech Foundation Inc., Maximum Amount: USD 18,424, Amount Awarded to Date: \$18,424, 11/01/2016-11/30/2019.

Kline, Earl. Pathways Grant to support new course development, Pathways, Virginia Tech Provost Office, Amount Awarded to Date: \$9,915, 04/13/2018-06/30/2019.

Quesada, Henry (70%) and Robert Smith (30%). Identification of Drivers and Barriers Impacting the Selection Process of Wood Products Suppliers for the U.S. Southern Construction Industry, South Carolina Forestry Commission, Maximum Amount: \$45,727, Amount Awarded to Date: \$45,727, 08/20/2018-08/19/2019.



Quesada, Henry (50%) and Brian Bond (50%). Expanding Markets for Thermally-modified Wood Products Produced from Low-value Hardwood Species, USDA Forest Service, Department of Agriculture, Amount: \$123,243, 07/01/2018-06/30/2020.

Quesada, Henry. Formación Para el Trabajo Familia: "Ocupacional Cultivo y Aprovechamiento Agropecuario y Forestal", Escuela Nacional Central de Agricultura (ENCA) Guatemala. Millenium Challenge Corporation, GOPA Consultants, Virginia Tech and EARTH University, Millennium Challenge Corporation (GOPA Consultants Prime), Other, Amount Awarded to Date: \$1,200,000, Principal Investigators: Goncalves SGOPAM; Crowder LV; Quesada H; Ignosh J; Sherrard DEARTHU; Mazzola JEARTHU, 06/01/2018-05/31/2021.

Refereed Publications:

Bush, Robert, Jonghun Park, Laszlo Horvath, Mark White, and Philip Araman. 2018. The influence of stretch wrap containment force on load bridging in unit loads. *Packaging Technology and Science*, 31(11), 701-708.

Quesada, Henry, Brian Bond, Sailesh Adhikari and Shawn Grushecky (n.d.). 2019. Analysis of Hardwood Lumber Grade Yields Using Monte Carlo Simulation. *BioResources* 14(1)2029-2050.

Quesada, H., Robert Smith, and Gunter Berger. 2018. Drivers and Barriers of Cross-laminated Timber (CLT) Production and Commercialization: A Case Study in the Western Europe's CLT industry. *BioProducts Business*, 3(3), 29-38.

Smith, R. and P. Valverde. (2019). The Current and Future State of Wood Science Education in the United States. *Wood and Fiber Science*. April

Pitti, A.; Espinoza, O. and **Smith, R.** 2019. Marketing Practices in the Urban and Reclaimed Wood Industries. *BioProducts Business*, 4 (2), 15-26.

Kakkar, G; Quesada, H. and **Smith, R.** 2019. Assessment of U.S. Manufactured System-build Wooden Homes as an Affordable Housing Alternative for Low-income Households in Developing Countries. *BioProducts Business*, 4 (4), 21-50.

Trade Journal Publications Refereed:

Quesada, Henry, Paul Fallas, and Nicolas Navarro. 2018. Wasted Motion – The Basics of Conducting a Motion/Time Assessment at Your Facility. *Pallet Enterprise*. Accepted. March.



Quesada, Henry, Brian Bond, and Paula Fallas. 2018. A Lean Logistics Framework: Applications in the Wood Fiber Supply Process. Report submitted to WSRI.

Extension Publications:

Quesada, Henry. SBIO extension newsletter, Editor of the SBIO extension newsletter, published three times per year, 2014-Present, Editor/curator.

Quesada, Henry. Sustainable Innovation Management (SIM) web page, Web manager and editor of the SIM web page, 2010-Present, Editor/curator

Other Publications:

Quesada Pineda, Henry, and Joe Loferski. 2018. Phase I: Delimitation investigation of Cabinet Doors for American Woodmark.

Quesada, Henry and Joe Loferski. 2018. Phase II: Investigation of Delamination of Thermofoil form Medium Density Fiberboard Cabinet Doors.

Graduate Thesis/Dissertations:

Paul Fallas, January 2019, Application of Lean Logistics to Wood the Fiber Supply Chain, Henry Quesada, major professor.

Presentations:

Rara, Angela D. and Earl Kline. 2018. Wood Enterprise Institute at Virginia Tech. Poster session presented at the meeting of 72nd Forest Products Society International Convention, Madison, WI.

Kline, Earl. 2018. Learning Lab for Future Business Leaders. Poster session presented at the meeting of 2018 Pathways Summer Institute, Blacksburg, VA.

Kline, Earl. 2018. Panel Discussion - What is on Forestry's Bold Horizons?. In 2018 Virginia Forestry Summit. Richmond, VA.

Kline, Earl and Brian Wernecke. 2018. The Wood Enterprise Institute - Experiential Learning. In Student Experiential Learning Conference. Blacksburg, VA.

Quesada, Henry, Brian Bond, and Paula Fallas. 2018. A Supplier Selection Tool and Assessment Model for the Wood Industry: A Case Study in the Wood Fiber Supply



Chain. Poster session presented at the meeting of SWST international Convention. Nagoya, Japan.

Quesada, Henry, Robert Smith, and Gunter Berger. 2018. Incentives and Barriers of Cross-Laminated Timber (CLT) Production and Commercialization. Poster session presented at the meeting of Poster Session 2. SWST joint International Convention. November 5-9, 2018. Nagoya, Japan.

Quesada, Henry and Eva Haviarova. 2018. Market Opportunities for US Hardwoods in Eastern Europe. Poster session presented at the meeting of SWST joint International Convention. November 5-9, 2018. Nagoya, Japan.

Quesada, Henry, Brian Bond, and Sailesh Adhikari. 2018. Value Analysis of Appearance-Grading vs Combined Appearance and Stress-Grading for Hardwood Logs. Poster session presented at the meeting of SWST International Convention. Nagoya, Japan.

Quesada, Henry and Robert Smith. 2018. Drivers and Barriers of Cross-laminated Timber (CLT) Production and Commercialization. Poster session presented at the meeting of 2018 International Mass Timber Conference.

Invited Lectures and Presentations:

Kline, Earl. 2018. Panel Discussion - What is on Forestry's Bold Horizons? In 2018 Virginia Forestry Summit. Richmond, VA.

Hammett, Tom. 2018. Making Projects Productive in Large Classes: Lessons Learned from Across Disciplines. The In at Virginia Tech, Blacksburg, VA.

Hammett, Tom, and M. Rechlin. 2018. Developing Project Skills through Experiential Learning The Case of Making Maple Syrup with Bioenergy. In CHEP, Blacksburg, VA.

Hammett, Tom 2018. Exploring Experiential Learning in Training Natural Resource Professionals: Challenges and opportunities. Auburn University, Auburn Alabama. (Seminar).

Quesada, Henry. 2018. Current situation of hardwood lumber utilization in the Cross-laminated timber (CLT) market. December. London, UK. (Panel, Seminar).

Quesada, Henry. 2018. Is there an opportunity for hardwood lumber in the cross-laminated timber (CLT) market?. In National Hardwood Lumber Association Convention. October. Toronto, Canada.



Quesada, Henry. 2018. Is there an opportunity for hardwood lumber in the cross-laminated timber (CLT) market?. Canadian Hardwood Lumber Association meeting. October. Toronto, Canada.

Short Courses & Continuing Education:

Bush, Robert. 2018. VFPA Educational Session, Richmond, Virginia, May, 20 participants.

Hammett, Tom. 2018. Team work and case study work for success. Graduate student workshop to develop skills in working as teams across disciplines. July, 15 students.

Hammett, Tom. 2018. Coordinating curriculum and needs of employers. Capacity development workshop for adjunct faculty at the Agriculture and Forestry University, Bharatpur/Rampur, Nepal. July, 7 students.

Hammett, Tom. 2018. Active and project centered learning. Day-long workshop for faculty to help them incorporate active and project-centered learning into their courses, July, 12 students.

Quesada, Henry. 2018. Developing occupational Families for Agroforestry and Agricultural Technical Education. Guatemala, Guatemala. Co-organizer and presenter. September, 65 participants.

Quesada, Henry. 2018. 101 Wood Basics/NAWLA. Organizer and presenter. Oregon State University, Corvallis, Oregon, September, 45 participants.

Quesada, Henry. 2018. Use of Low value Hardwoods for CLT and other Value-added Products in Central Hardwood Region: Part II, Co-organizer and presenter, Borden, IN. August, 25 participants.

Courses Taught:

FREC 2784 Global Forest Sustainability
Fall 2018
Credit Hours: 3
Instructor: Tom Hammett
No. of Students: 29

SBIO 1004 Explorations in SBIO
Semester: Fall 2018
Credit Hours: 1
Instructor(s): Earl Kline
No of students: 10



SBIO 1234 Introduction to Wood Design and Craftsmanship

Semester: Fall 2018

Credit Hours: 3

Instructor: Earl Kline/Urs Buehlmann (each 50%)

No of students: 19

SBIO 2104 Principles of Packaging

Semester: Fall 2018

Credit Hours: 3

Instructor: Robert Bush

No. of students: 36

SBIO 2104 Principles of Packaging

Semester: Fall 2018

Credit Hours: 3

Instructor: Robert Bush

No. of students: 26

SBIO 2614 Introduction to Forest Products Marketing

Semester: Spring 2019

Credit Hours: 3

Instructor: Robert Bush

No. of students: 31

SBIO 2784 Global Forest Sustainability

Semester: Fall 2018

Credit Hours: 3

Instructor: Tom Hammett

No. of Students: 73

SBIO 3004 Sustainable Nature-Based Enterprise

Semester: Fall 2018

Credit Hours: 3

Instructor: Tom Hammett

No. of Students: 46

SBIO 3445 Wood Design and Innovation I

Semester: Fall 2018

Credit Hours: 3

Instructor: Earl Kline

No of students: 18

SBIO 3445 Wood Design and Innovation II

Semester: Spring 2019

Credit Hours: 3



Instructor: Earl Kline
No of students: 5

SBIO 3464 Forest Products Business
Semester: Spring 2019
Credit Hours: 3
Instructor(s): Henry Quesada
No of students: 56

SBIO 3954 Study Abroad in Costa Rica
Semester: Winter 2019
Credit Hours: 3
Instructor(s): Henry Quesada/Brian Bond
No of students: 13

SBIO 4054 Packaging Systems Design Practices
Semester: Spring 2019
Credit Hours: 3
Instructor: Robert Bush
No. of students: 42

SBIO 4974 Project Management Standards for New Product Launch
Semester: Fall 2018
Credit Hours: 3
Instructor: D. Earl Kline
No. of students: 1

SBIO 4984 Advanced Research in Industrial Hemp
Semester: Fall 2019
Credit Hours: 3
Instructor: Tom Hammett
No. of students: 1

SBIO 5114 Professional Skills SBIO Graduate Students
Semester: Fall 2018
Credit Hours: 2
Instructor: Robert Bush
No. of students: 7

SBIO 5974 Circular Economies for Sustainable Systems
Semester: Fall 2018
Credit Hours: 3
Instructor(s): Earl Kline
No of students: 1



Hammett: Faculty Advisor to Service Without Borders. Co-led service learning trip for seven undergrads, five from the College of Engineering and one each from the College of Natural Resources and General Studies, to address previously identified needs in a Village in the Mustang province in Nepal's highlands. Total students advised: 7

Members

Appalachian Hardwood Manufacturers, Inc.

PO Box 427, High Point, NC 27261

Phone: (336) 885-8315; **Fax:** (336) 886-8865

Email: tom@appalachianwood.org; **Website:** www.appalachianwood.org

Contact: Tom Inman, President

AHMI is an association that promotes logs, lumber and products from the Appalachian region.

Atlanta Hardwood Corporation

5596 Riverview Road, Mableton, GA 30126-2914

Phone: (404) 792-2290; **Fax:** (404) 792-2294

Email: ahc@hardwoodweb.com; **Website:** www.hardwoodweb.com

Contacts: James W. Howard, Jr., President; Marty Payny, Sales Manager; and Patrick G. Altham, VP Export

Products: boards, common; boards, select; flooring; moulding

Species: alder, ash, basswood, beech, cherry, hickory, imported hardwoods, mahogany, hard maple, soft maple, white maple, red oak, white oak, poplar, walnut, eastern white pine

Baillie Lumber Company

PO Box 6, Hamburg, NY 14075

Phone: (716) 649-2850; **Fax:** (716) 649-2811

Email: information@baillie.com; **Website:** www.baillie.com

Contacts: Jeff Meyer, President; Kenneth A. Philbrick, Yard Operations Manager

Products: boards, common; boards, select

Species: ash, basswood, beech, birch, cherry, red elm, hickory, hard maple, soft maple, red oak, white oak, poplar, walnut



Bingaman & Son Lumber, Inc.

PO Box 247, Kreamer, PA 17833

Phone: (570) 374-1108; **Fax:** (570) 374-5342

Email: cbingaman@bingamanlumber.com; **Website:** www.bingamanlumber.com

Contacts: Chris Bingaman, Vice President Operations/Sales Manager

Products: boards, common; boards select; glued-up stock; furniture dimension

Species: ash, basswood, birch, cherry, hickory, mahogany, hard maple, soft maple, red oak, white oak, poplar, black walnut, eastern white pine

Boehm-Madisen Lumber Co., Inc.

PO Box 906, Brookfield, WI 53008-0906

Phone: (262) 544-4660; **Fax:** (262) 544-0795

Email: boehmmad@execpc.com

Contacts: Thomas J. Kestly, Sr.

Products: boards, common; boards, select; flooring; timbers; cutstock; log cabin siding; glued-up stock; pattern stock; decking, laminated; decking, roof; dimension, furniture; dimension, precut; edge-glued products;

Danzer Group

Danzer Veneer Americas, PO Box 3455, Williamsport, PA 17701

Phone: (570) 322-4400; **Fax:** (570) 322-7213

Email: vijay_reddy@danzervenveer.com; **Website:** www.danzervenveer.com

Contact: Dr. Vijay Reddy, Vice President, (724) 827-8366 Darlington, PA.

Products: veneers for panel, furniture, door, cabinet, edge-banding and flooring, dimension, dry; cutstock; glued-up stock; moulding; fingerjoint stock; furniture dimension; window & sash stock

Species: white ash, aspen, basswood, birch, cherry, black cypress, hickory, hard maple, poplar, red oak, soft maple, white maple, white oak, walnut ash



Fitzpatrick & Weller, Inc.

PO Box 490, Ellicottville, NY 14731-0490

Phone: (716) 699-2393; **Fax:** (716) 699-2893

Email: sales@fitzweller.com; **Website:** www.fitzweller.com

Contacts: Dana Fitzpatrick, Executive Vice President

Products: boards, common; boards, select; dimension, dry; glued-up stock; moulding; dimension, furniture

Species: ash, white ash, basswood, beech, birch, cherry, hickory, maple, hard maple, soft maple, white maple, red oak, white oak, poplar, hemlock, eastern white pine

Frank Miller Lumber Company, Inc.

1690 Frank Miller Road, Union City, IN 47390

Phone: (765)-964-3196; **Fax:**(765)-964-6618

Email: clea@frankmiller.com; **Website:** www.frankmiller.com

Contacts: Martha Miller Mathias – President, CEO, COB

Products: boards, common; boards, select; dimension, green, quarter rift lumber

Species: white ash, basswood, beech, cherry, elm, hackberry, hard maple, soft maple, white maple, red oak, white oak, yellow poplar, black walnut

Hardwood Manufacturers Association

665 Rodi Road, Suite 305, Pittsburgh, PA 15235

Phone: (412) 244-0440; **Fax:** (412) 244-9090

Website: info@hardwood.org

Contacts: Linda Jovanovich

HMA is an association that assists the furniture, flooring, kitchen and bath, and moulding and woodwork industries with hardwood information.

Hardwood Market Report

PO Box 2633, Memphis, TN 38088-2633

Phone: (901) 767-9126; **Fax:** (901) 767-7534

Email: hmr@hmr.com; **Website:** www.hmr.com



Contact: Judd Johnson, Editor

Hardwood Market Report, established in 1922, is a weekly publication giving benchmark pricing information and marketing commentary on North American hardwood lumber and the hardwood products industry

Industrial Timber & Lumber Company

23925 Commerce Park, Beachwood, OH 44122

Phone: (216) 831-3140; **Fax:** (216) 831-4734

Email: sales@itlcorp.com; **Website:** <http://www.itlcorp.com>

Contacts: Larry Evans, President

ISK Biocides, IBC manufacturing

416 E. Brooks Road, Memphis, TN 38109-0158

Phone: (901) 344 5350; **Fax:** (901) 344 5387

Email: info@ibio.com

Contact: Joe Ignatoski, President , COO; Lance Johnson, District Sales Supervisor

Products: sap stain and mold preventatives; industrial wood preservatives; WOODguard and Natural Home--wood protection for the homeowner.

Jim C. Hamer Company

PO Box 418, Kenova, WV 25530

Phone: (304) 453-6381; **Fax:** (304) 453-6587

Email: idearing@jimchamer.com; **Website:** www.jimchamer.com

Contacts: Steve Hamer, President

Products: boards, common; boards, select; dimension, furniture

Species: ash, beech, hard maple, soft maple, red oak, white oak, poplar

Spartanburg Forest Products, Inc.

1431 Highway 101 South, Greer, SC 29651

Phone: (864) 699-3100; **Fax:** (864) 699-3101

Email: smichael@gsponline.net; **Website:** www.sfpinc.biz

Contact: Stephan W. Michael, President/CEO

Spartanburg Forest Products, Inc. is a marketing and management organization, focusing in treated and engineered wood products.



T & S Hardwoods, Inc.

Harrisburg Road, PO Box 1233, Milledgeville, GA 31059

Phone: (478) 453-3492; **Fax:** (478) 453-9002

Email: dsmith@tshardwoods.com; **Website:** www.tshardwoods.com

Contacts: Larry N. Thompson III., President

Products: boards, common; boards, select; dimension, green; railroad ties; timbers

Species: brown ash, cherry, cottonwood, soft elm, sap gum, hickory, soft maple, red oak, white oak, pecan, yellow poplar, sycamore, black walnut, cedar, cypress

USDA Forest Service

Northern Research Station, 180 Canfield St., Morgantown, WV 26505

Phone: (304) 285 – 1500

Contact: Ed Cesa, Research Scientist

USDA Forest Service

Southern Research Station, 1650 Research Center Dr., Blacksburg, VA

Phone: (540) 231 – 5341

Contact: Phil Araman, Senior Research Scientist

Virginia Forest Products Association

220 East Williamsburg, PO Box 160, Sandston, VA 23150-0160

Phone: (804) 737-5625; **Fax:** (804) 737-9437

Email: vfpa@att.net; **Website:** www.vfpa.net

Contact: Susan Seward

VFPA is an association active in promoting state and local codes and regulations developed to provide safety to life and property from the hazards of fire.



W. M. Cramer Lumber Company

PO Box 2888, Hickory, NC 28603

Phone: (828) 397-7481; **Fax:** (828) 397-3763

Email: wmc@cramerlumber.com; **Website:** www.cramerlumber.com

Contact: Wendell Cramer, President

Products: boards, common; boards, select

Species: poplar, red oak, white oak, ash, hickory, beech, soft maple, cherry, hard maple, elm, basswood, chestnut, mahogany, white pine, ponderosa pine

Wood Preservers, Inc.

PO Box 158, Warsaw, VA 22572

Phone: (804) 333-4022; **Fax:** (804) 333-9269

Email: mwright@woodpreservers.com; **Website:** www.woodpreservers.com

Contact: Morgan Wright, President

Products: boards; softwood dimension; timbers; ties

Species: loblolly pine, longleaf pine, shortleaf pine