



SUSTAINABLE BIOMATERIALS

Winter Newsletter



In this issue:

Recycling skateboards, New employees, WEI Update

Hello from your Department



As a new year begins and a new semester starts, it is time for those “resolutions” that we like to break within a couple of weeks. If it was only as easy as the doctor said it is to lose those 20 extra pounds or make time

to get in that 30 minutes of exercise a day to feel better. Our department set goals (resolutions) in 2012 when we introduced our new degrees and name change. I am glad we did a better job of keeping those than I have done recently on my own new year’s resolutions. Our programs, faculty, and student numbers continue to grow thanks to those resolutions we committed ourselves to back in 2012.

Our department has had a long history of our students participating in experiential learning (undergraduate research, internships, service learning opportunities and study abroad). It has always been part of the culture of our educational experience for students. I am very proud to say that the department was awarded a “2017 Exemplary Department Award” from the university for these efforts. It demonstrates the commitment of our faculty and staff to provide a complete education with students learning by doing and applying what they learn from the classroom. I want to congratulate

and thank all of the department on this great recognition.

In this newsletter, you will see the addition of three new faculty members and new additions to our graduate students. Our packaging program has added one full-time and one part-time instructor to better serve our 120+ undergraduates. Eduardo Molina will be teaching classes in CAD Design and a senior capstone class this year and will add two more classes next year. Ms Wonjung Jung will be teaching a class in Packaging Design this semester and will offer an additional advanced class in that area next year. For a number of years, students had requested more opportunity for design classes so our hope is to serve them better. Last November, Dr. Li Shuai joined our faculty in the biomaterial science area where his expertise is in lignin chemistry. He will be teaching a class in the fall in this area. Our faculty led study abroad classes to New Zealand, Costa Rica, and Nepal over the winter break. The WEI has developed and is marketing a unique product this year, that has been well received by their customers already. We have an undergraduate trying to recycle skateboards.

If you have any questions on the content of this newsletter or anything else regarding the department, please contact me at 540-231-7679 or email rsmith4@vt.edu

Virginia Tech undergraduate students completed a sustainability Wintermester course in Costa Rica

BY HENRY QUESADA

Under the leadership of Drs. Henry Quesada and Earl Kline from the Department of Sustainable Biomaterials at Virginia Tech, a group of 13 students traveled to Costa Rica to learn about sustainability of natural resources. Students registered for this Wintermester course came from the Colleges of Natural Resources and Environment, Agriculture, Engineering, and Liberal Arts. During their time in Costa Rica, the students learned about sustainable agriculture, renewable energy, wildlife management, and forest management.

The logistics and educational activities were organized in conjunction with EARTH University, a private higher-level educational institution that was funded early in the 1990's by several local and international organizations including the United States Agency for International Development (USAID). During the first five days of the trip, the group stayed at EARTH University campus in Guacimo, Limon; a stunning 8,000 acres property surrounded by the rain forests and large agricultural crops such as bananas and pineapples.



The group is ready to start lectures and hands-on activities at EARTH University campus in Guacimo, Limon



Students during their visit to Miravalles Volcano Geothermal Energy project.

For the second part of the course, the students traveled to the city of Liberia in the Costa Rican north pacific where EARTH University owns a second campus in the middle of the dried tropics, a very different location from the main campus in Guacimo. The academic efforts of the Liberia campus focus on issues such as climate change and impacts on forestry, precision agriculture, renewable energy, and irrigation.

Among other academic activities required by the course, students kept and maintained a journal where they were challenged to draw comparisons with the US and use their previous experiences and knowledge to connect the course's learning experiences with their personal, civic, and academic perspectives.

Titantic Investigation

Did you ever wonder whether Jack could have survived the sinking of the Titanic? The Washington Post did an investigation on this

recently. They contacted Dr. Brian Bond in their quest to figure out the density of Northern red oak. Check out the youtube link below to view.

[YOUTUBE VIDEO](#)

2017 University Exemplary Department Award

BY DR AUDREY ZINK-SHARP

We are very pleased to announce that our department was chosen to receive a University Exemplary Department Award from Virginia Tech's Office of the Provost for the 2017-2018 academic year. The award honors efforts and achievement in maintaining exemplary teaching and learning environments for students and faculty. This year's award was to recognize

departments that effectively engage students and faculty in a hands-on, minds-on instructional environment. Our department was 1 of 3 chosen from 20 nominations across our campus. Bob Smith received the award for the department at a ceremony honoring the departments on February 8 2018. See the VT News [article](#).



Bob Smith, head of the Department of Sustainable Biomaterials, accepts the 2017 Exemplary Department Award from Cyril Clarke, interim executive vice president and provost.

2018 Wood Enterprise Institute Update BY EARL KLINE

During the current 2017-2018 academic year, 18 new students (Figure 1) joined the team. Nearly a third of the students come from a variety of disciplines such as building construction and industrial design. This year's WEI team begins a new business around a product based on the advice of the previous year's team: "keep it simple." Based on this advice, a business plan was developed to make and sell beer flights (Figure 2) to address the needs of restaurants and craft beer breweries that offer beer tastings to their customers. This product is simple

and easy to manufacture but it has been specially designed to help our target market. The market in the past has always been to Virginia Tech Alumni, family and friends. However, this year's challenge was to go beyond our familiar market and to diversify by offering beer flight solutions to restaurants and breweries. Plans are to still market to Virginia Tech alumni and friends, but the main focus is to diversify into new markets to learn what new opportunities are available for subsequent WEI business cycles.



Figure 1. 2017-2018 WEI team (L-R): Sarah Blome, Emily Rutkowski, Brian Wernecke, Erin Lash, Austin Miles, Angela Rara, Sanford Shepard, Dakota DeLeonardis, Bradley Turner, Megan Krest, Ryan Longman, Justin Strawser, Kyle Reymann, Jackson Howard, Tommy Nguyen, Jacob Jin, Dylan Harris, and Jonathan Burger



Figure 2. The 2017-18 Wood Enterprise Institute beer flight. By partnering with local restaurants, we have designed a product that makes serving beer samples not only aesthetically unique but also safer and easier for restaurant staff.

The plan is to make, sell and deliver over 250 units by the end of the spring semester. By December, one customer order for 50 units has already been fulfilled! This is another WEI first --- the team was not only production ready by December, they already began selling products the earliest of any team. Building on this momentum, the group is on target for a substantial return on investment for the new product. This year, the students have an opportunity to challenge themselves and learn new things that no other team has been able to do in the past. Examples of some project challenges include testing new marketing strategies, reducing

the cost and environmental footprint of the product, integrating continuous improvement into business operations, and a more formalized system for professional growth and development. Results from these projects will set a new bar for next year's team.

The Wood Enterprise Institute acknowledges and thanks the many generous donations and continuing support from our sponsors and friends. This support allows us to create a realistic business experience for the students in a safe and well-equipped environment that inspires creativity and entrepreneurship.

Department receives research grants to develop a non- chemical alternative to methyl bromide fumigation of imported and exported logs

BY MARK WHITE

The Virginia Tech, Department of Sustainable Biomaterials is the lead institution in a \$500,000, two year grant "Evaluation of vacuum and steam heat as a methyl bromide alternative for the phytosanitary treatment of hardwood and softwood logs." The funding is provided by the USDA, National Institute of Food and Agriculture and the USDA Forest Service, State and Private Forestry. The lead scientists are Drs Zhangjing Chen and Marshall White. Also participating are Drs Henry Quesada and Brian Bond. Cooperating Institutions include University of Minnesota and Purdue University.

To prevent the migration of invasive forest pests, logs moving international must be treated. The most common treatment is fumigation with methyl bromide. Methyl bromide is very dangerous to use and a class 1 ozone depleting chemical. With the exception of pre-shipment and quarantine critical applications, the use of this fumigant has ceased by international agreement in the 1992 amendment to the Montreal Protocol. Currently, the second largest use of methyl bromide in the US is for the pre-shipment and quarantine treatment of logs. Earlier research by Drs Chen and White, has demonstrated

that the physics of steam and vacuum can be adapted to the thermal sanitation of logs and thus preventing the international migration of invasive pathogens and insects. Log quality is unaffected and treatments are very efficient. These studies have included successfully treating logs naturally infected with Asian long horned beetles, walnut twig beetles emerald ash borers,



and thousand canker and oak wilt fungus. Chen and White have designed and built a portable pilot plant that will be moved around the country during the two years of the current research grant to treat other naturally infested logs for the purpose of developing effective treatment schedules.

These Vacuum/steam treatment schedules will then be included in the USDA treatment manual for commercial application. Dr. Quesada will be conducting a commercial feasibility analysis of the technology and Dr. Bond will be coordinating a national continuing education program to introduce this new technology to stake holders involved in the international shipment of logs.

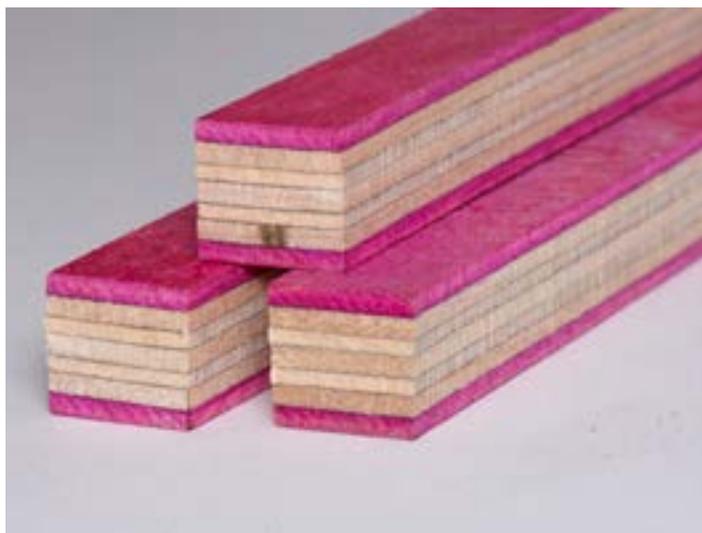
Photo above: Oak wilt logs in vacuum steam chamber.

Undergraduate research in SBIO on recycling wooden skateboards

BY DYLAN WILLARD AND JOE LOFERSKI

We have all watched the skateboarders zipping by us on campus and maybe even doing jumps or tricks but most of us have never looked closely at a skateboard and wondered how it is made, what it is made from and how it can be recycled into a new useful item.

During the fall semester of 2017, sophomore Dylan Willard in the Sustainable Biomaterials Department, did an undergraduate research project investigating the possibilities for recycling skateboards. The skateboards are made from high quality maple plywood that is often dyed with beautiful colors as seen in the photographs. During Dylan's project, he focused on studying the material properties of used skateboards and successfully made multiple samples of wood panels from recycled skateboards.



Individually cut .5x.5-inch strips of skateboard, which are glued together to make panels. Note the top veneers dyed pink.

Areas of study which Dylan focused on included measuring the stiffness (Modulus of Elasticity --MOE), stress at failure (Modulus of Rupture—MOR), moisture content, specific gravity, moisture durability, species identification, and methods of engineering new items from used and broken skateboards. All of his research was done at the Brooks Forest Products Center under the supervision of Dr. Joseph Loferski and Mr. David Jones, SBIO wood shop manager.

The exact number of skateboards manufactured annually is unknown, but it is estimated to be in the millions. For example, PS Sticks, a skateboard manufacturing company which produces skateboard decks for brands such as Element, FA, Welcome, Quasi, and Toy Machine, has been found to produce on average 300,000



Dylan Willard ready to skate!

skateboards a year. For serious skaters who do tricks and jumps, skateboards only last a few months before they break or deteriorate beyond use. The wheels or “trucks” are salvaged and installed on a new board but millions of used skateboard decks are discarded annually, ending up in landfills when, instead, they could be recycled. But beyond artistic or aesthetic purposes, a practical structural application has not been discovered for recycling skateboards.

Dylan, now 19 years old, has been skateboarding since the age of 14. After breaking his first skateboard and being forced to buy another, Dylan decided to keep the original broken deck. As time went on and he had been through multiple skateboards, Dylan inevitably decided to keep them all. After 5 years of skateboarding, Dylan decided it was finally time to put all of his old skateboards to use and wanted to use them in a practical fashion. After consulting with Dr. Loferski, they formulated a research project to investigate the material properties of skateboards for use as a sustainable recyclable material.

Currently, Dylan is preparing a manuscript to submit his findings to a technical journal, hoping to spark ideas in others who may also pursue this area of study. Dylan is optimistic about his next years at Virginia Tech to continue his research on the possibilities of recycling skateboards and is also looking into conducting research in different fields within his department.



Another example of colorful wooden panels made from recycled skateboards.



Sample of skateboards in an oven being tested for moisture content and specific gravity.

Welcome Dr. Li Shuai



I obtained my B.E. degree in Materials Science and Engineering from China (2007) with specialty in polymer and composites. During my undergraduate

study, I got to know “biomass conversion” from a professor who blended lignin with a polymer and processed the mixture into a biodegradable agricultural mulching film. I thought it was very cool that renewable biomass could be used to make the products we needed for our daily lives. Therefore, I decided to pursue my PhD degree in the Department of Biological Systems Engineering at the University of Wisconsin-Madison (2007). Back to ten years ago, “biofuel” was a very hot topic, and my research was therefore focused on converting biomass into fermentable sugars or transportation fuels. My doctoral research earned me the Wisconsin Distinguished Graduate Fellowship Award (2011) and the Gold Prize of the International Academy of Wood Science PhD Research Award (2014).

Upon graduation, one of my patents was licensed to a Chinese company, and I was invited by the company to continue working on the patented

technology regarding converting biomass into sugars. I started a new lab in the R&D center of the company in 2012. My research group in the company worked on several biomass-related projects, such as biomass conversion to sugars, production of prebiotics from xylan, fermentation of sugars into PHB (Polyhydroxybutyrate) polymer, and preparation of lignin-PHB biodegradable composites. After working in industry for two years, I still liked the academic working environment, therefore I moved to the Swiss Federal Institute of Technology (EPFL) in Switzerland and started as a postdoctoral researcher there in 2015. In EPFL, I started to study lignin valorization. I came with up a new “lignin stabilization” strategy to minimize lignin condensation during biomass fractionation, and the research result was published in Science Magazine in 2016.

In 2017, I moved to DOE’s Catalysis Center for Energy Innovation at the University of Delaware as a postdoc researcher to strengthen my skills in catalysis. At present, I am the (co)author of eight patents and have published sixteen articles in peer-reviewed journals such as Science Magazine, Energy & Environmental Science, Green Chemistry, and ChemSusChem. My research here in VT will be focused on developing innovative pathways for conversion of biomass to value-added fuels, chemicals, and materials, which can be used to replace the ones derived from petroleum. During the study, I expect to fundamentally understand the degradation and condensation behaviors of lignocellulosic components during

fractionation and the upgrading processes, and design innovative reaction pathways, solvent systems, and catalysts to improve product selectivity and yield. I plan to create and teach one undergraduate level course “Biorefinery” and one graduate course “Lignin Chemistry.”

New packaging design class being taught this semester

BY WONJUNG JUNG

Design Fundamentals for Packaging I (SBIO 2984) class will be a project-oriented class. Students will become familiar with the visual language and fundamental design theories from lecture. And then, they can apply those concepts a hands-on project. The instructor will encourage not only practical application but also innovative ideas. Studies will include exercises in 2D using various materials and tools.

Wonjung Jung has taught art and design for 15 years. She wanted to be a studio artist when she majored in painting at the Seoul National University in Korea. However, after the first semester of teaching, she found being an instructor was a very rewarding experience. It was especially exciting for her to observe a student’s progress throughout the semester. Recently, she has been working as an adjunct faculty

in the School of Visual Art at Virginia Tech and New River Community College. She has covered a wide range of art subjects, from Drawing I & II, Introduction to Illustration and Water Media at Tech and Graphic Design and Art History at New River Community College. She thought this range of courses could converge or interrelate with each other and often suggests a fresh perspective and inspiration. She has also published 5 children’s picture books. One of them received the Grand Prize in the Korean Christian Publisher’s Association in 2011.



[Wonjung's resume](#)

Welcome Our New Packaging Instructor - Eduardo Molina



Eduardo Molina joined the department in January, 2018. He started his professional career with a Bachelor's Degree in Industrial Production Engineering from Costa

Rica Institute of Technology and acquired professional experience working for five years as a Supply Chain Planning Analyst for a global corporation. Afterwards, he obtained a Master of Science degree in Packaging Systems and Design from Virginia Tech.

When he was taking undergraduate classes, he acquired an interest in Logistics and Supply Chain operations and decided to develop professionally in that area. Working as a Planning Analyst for Kimberly Clark Corporation he obtained knowledge and experience on the practical management of a global supply chain, including material handling in warehouses, local and international transportation and financial

impacts of every decision. With this background and having experienced the importance of packaging in the logistics operations, he decided to pursue further education with a Master of Science degree in Packaging at Virginia Tech.

During his postgraduate education, he developed skills in packaging systems with an emphasis on transportation. He conducted research on the interactions between pallets, packages and the material handling equipment, specifically the effect of the stacking pattern of the packages on the pallet performance. This was conducted to further characterize the load bridging effect and collaborate in the process of improving the pallet design, reducing costs and increasing sustainability. He also worked as a Graduate Laboratory Manager at the Center for Packaging and Unit Load Design. This job, in addition to the graduate research, allowed him to learn extensively about the physical testing of packaging materials and its design, proper use of equipment and development of operational procedures, as well as an opportunity to guide and mentor undergraduate students.

Eduardo will be teaching SBIO 2004 CAD in Packaging and another class to be determined.

New Graduate Students

My name is Apratim Jash, a new PhD student under the supervision of Dr. Maren Roman. I am coming from India, where I finished my Bachelor of Engineering degree, after that I joined University of Guelph at Canada to pursue master's degree. In between my research and study whenever I get an opportunity, I love to travel or do outdoor activities. Apart from that, during my free time I love binge watching TV series, listening to music or playing video games. At Virginia Tech, my research work would focus on the utilization of surfactants to increase the surface functionality of wood specimens. I am really excited about my stay at Blacksburg and I am looking forward to making new friends.



My name is Yang Zhou. I was born in Tangshan, China, a city rebuilt by a miracle on the debris after the devastating earthquake in 1976. I am proud of my hometown. However, due to a strong dependence on fossil fuels, pollution issues have become severe in Tangshan. I wish I could devote myself to the development of the sustainable energy industry by applying my theoretical knowledge and practical experience. I am a Ph.D. student and my major professor is Dr. Li Shuai.

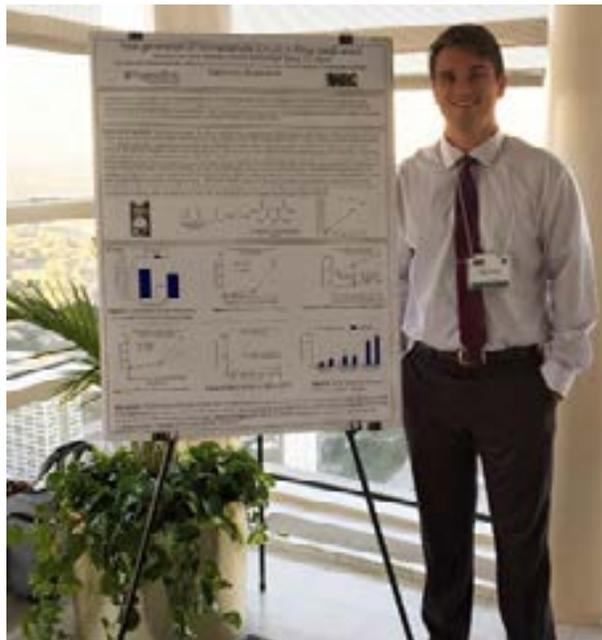
Poster competition win

BY CHIP FRAZIER

Mr. Benjamin Peed, a senior in Sustainable Biomaterials, earned the \$300 Second Place prize in the poster competition at the 2017 International Conference on Wood Adhesives, Oct. 25, 2017 in Atlanta Georgia! Perhaps even more impressive is that Ben was the only undergraduate student among 22 competitors- the rest were graduate students and professionals. Ben presented his research (Heat Generation of Formaldehyde in Pinus taeda Wood) that was funded through the National Science Foundation, Research Experiences for Undergraduates program. Ben's research was requested by the industry members of the Wood-Based Composites Center (WBC), a National Science Foundation, Industry/University Cooperative Research Center. For nonstructural wood composites,

as in cabinetry for example, regulations for allowable formaldehyde emissions have been tightened such that the natural formaldehyde in wood can play a role in regulation compliance. Ben said, "I learned that when wood is heated- like it is during hot-pressing- I learned that wood generates formaldehyde; and I learned how to measure it accurately." Ben added, "I have to thank my co-authors, Niloofar Shivyari and Mohammad Tasooji for helping me." Shivyari and Tasooji are Ph.D. students in Macromolecular Science & Engineering, working with Dr. Chip Frazier, Professor in Sustainable Biomaterials and Director of the WBC. When asked what he will do with the prize money, Ben replied with a smile, "Well...Dr. Frazier made a few suggestions, or I mean he repeated one suggestion over and over; but I think I will wait for some other suggestions."

Ben Peed at the International Conference on Wood Adhesives, October 2017.



Welcome, Xilong Zhao!

BY DAN HINDMAN

Xilong (pronounced Shee-long) Zhao is a visiting scholar from the College of Materials Science and Art Design at Inner Mongolia Agricultural University in Huhhot, Inner Mongolia. Xilong is the director of the Department of Furniture Design and Engineering. He will be working with Dr. Hindman looking into the design and use of cross-laminated timber (CLT) materials.



Xilong Zhao, Visiting Scholar

Xilong's office is in the Composites Graduate loft. Please extend a warm welcome to our visitor!

Upcoming short courses

The Center for Packaging and Unit Load Design has two upcoming short courses. The [Unit Load Design](#) short course is May 1-3, 2018. The [Wood Pallet Design](#) short course is August 21-23, 2018.

Fall graduates

The department had 16 undergraduate students graduate at the fall graduation.

Passing of a former employee

Harold Vandivort passed away on July 20, 2017. He was instrument maker supervisor for the Department of Sustainable Biomaterials from 1973 until 1995.

When Harold retired in 1995 Dr. Fred Lamb said that "the metal fixtures that are used in testing wood and wood products and the other specialized laboratory testing apparatus are all products of Harold's shop. Many graduate students owe the success of their research projects to the test fixtures fabricated (and often designed) by Harold."

Hello, Maslow BY DAN HINDMAN

The Maslow CNC is a two-dimensional CNC machine using a conventional router to cut sheet goods. The Maslow is operated by a set of three motors – two motors suspended from roller chains which control the position of the device, and a third motor controlling the router depth of cut. Maslow is produced by a start-up company located in Portland, Oregon. Over

break, Daniel Hindman installed the Maslow in the lab. The device is intended to cut parts for quick prototyping and pre-fabricated building design. Currently, Kerrigan Strong, an undergraduate in SBIO, is conducting an independent study to explore the functionality of the Maslow CNC and develop procedures for safe operation.



Kerrigan Strong observes the Maslow CNC machine in operation.

Service Without Borders BY TOM HAMMETT

Students are increasingly interested in doing service work. Professor Tom Hammett, an advisor and founder of the Service Without Borders (SWB) group on campus lead a group of Virginia Tech students on a service trip to Nepal during the Winter Break. For many of the students it was their first trip to Asia, and to an underdeveloped country. Among the seven students in the group of travelers was Lauren Holt, Sophomore SBIO major. Nepal suffered from a major earthquake in 2015, and the

group worked on repairing and rebuilding in the central mountain area near Jomsom. The weather was very cold so some of the work was inside! They finished a warming house designed to help keep elderly villagers warm during the cold winter months (see the photos). Students also mapped an irrigation ditch damaged by the earthquake. They worked on clearing brush from around an irrigation channel so that in the spring and summer the channel can be rebuilt.



SBIO major Lauren Holt (left) mixing a batch of mud to cover interior walls while Sara Hernandez (Sr. Mech. Eng.) applies the mix to the walls.



VT students from SWB form a chain to pass cement from where it is mixed on the ground to build sidewalk and steps on the exterior (see above). The key is to ensure easy access to the building, especially in the winter.

SWB has a MOU for five years to help rebuild the village of Dhumba, in Jomsom. Dr. Hammett led

a previous work trip to Nepal with 6 students during the summer of 2016. Another SWB group is planning a work trip this summer to help build a school in Tanzania. A third branch of SWB is organizing a local service project in the New River Valley in collaboration with organizations such as Habitat for Humanity. The hope is that others from SBIO and the College will join in SWB activities.

Right: The SWB group (all with orange scarves) is joined by local villagers after a meeting to determine priorities for the next projects.





Specialists

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Extension highlights

The wood products industry in Virginia is a critical contributor to the economy of the state, an industry represented by more than 1,000 primary and secondary industries and over \$25 billion in economic impact.

The Department of Sustainable Biomaterials (SBIO) at Virginia Tech is one of the leading U.S. academic programs in the field of renewable materials with a focus on cellulosic materials such as wood products. Besides research and teaching efforts, SBIO has an important role in dissemination of new knowledge in the area of renewable materials through SBIO's three extension specialists.

SBIO extension specialist Quesada participates as a speaker at the NextGen Leaders Council Learning of the Hardwood Manufacturing Association.

Dr. Henry Quesada delivered a seminar presentation on November 2, 2017 to members of the NextGen Leadership program of the Hardwood Manufacturers Association (HMA). The seminar was delivered using the online tool WebEx and the topic was financial statement analysis.

SBIO Department continues to cooperate with Oregon State University on the 101 Wood Basics organized by NAWLA

During the week of September 11, 2017; extension specialist Henry Quesada participated as a speaker of the Fall 2017 version of the 101 Wood Basics organized by the North American Wholesale Lumber Association in Corvallis, Oregon.

Forty people participated in the Fall course that included lectures, hands-on activities, forest and industry tours.



Figure 1. Participants of the Fall 2017 101 Wood basics visited Zip-O Lumber in Eugene, OR



The Summer 2018 101 Wood Basics will be held the week of May 21, 2018 in Blacksburg, VA. To get more details and registration for the course, please visit the link <http://www.nawla.org/page/wood-basics>.

This introductory course is an ideal event for those new to the wood products industry and it has been offered for the last 35 years.

Upcoming events

Creating a Successful Small Forest Products Enterprise: A Review of the Fundamentals

**May 17, 2018
8:00 am to 4:00 pm**

**Richmond, VA
Exact Location to be Announced**

The success of any forest products business depends on the ability to maximize your produce recovery, understand your customer needs and providing them with the right products at a cost that allows you some profit. In this workshop we will break down these concepts into three fundamental units and cover the information to assist you in creating a successful small forest products business.

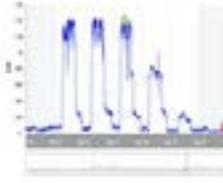
Wood processing (8:00 am- 10:30 am) by Dr. Brian Bond

Overview:

We'll start the workshop focusing on the manufacturing of lumber and end with drying of lumber. Being able to effectively select and price logs for your



expected output is critical to your business success. We'll then move onto the best sawing strategy given your log quality and desired product. Then we will cover the basics of how lumber is graded for hardwood and softwood markets and conclude with an introduction to lumber drying, a great way to expand your markets and take advantage of a value added process.



Topics covered:

- Log buying
 - Estimating Quality and Value
- Log breakdown
 - Sawing techniques
- Lumber grading
 - Overview of softwood and hardwood grading rules
- Lumber drying
 - Introduction to lumber drying
 - Available technologies for small and medium operations

Business Management (10:30 am - 12:30 pm) by Dr. Henry Quesada

Overview:

Business owners really need to understand basic financial management principles in order to know how profitable is their business. This section starts with an introduction to manufacturing costs and how indirect cost are allocated to processes and products. The second part covers the main highlights of financial statement analysis and the relationship between an income, balance sheet, and cash flow statement. Finally, there will be a discussion of the best possible strategies that small and medium size industry owners in this industry can implement to increase the value of the operation.

Topics covered:

- Cost Allocation
 - Direct techniques to allocate cost to products and processes
- Financial Management
 - Income, balance sheet, and cash flow statements
- Business Strategy
 - How to compete based on cost, product differentiation and niche markets

Lunch (12:30 pm-1:30 pm). On your own

Marketing and Selling principles (1:30 pm – 4:00 pm) by Dr. Bob Bush

Overview:

The last section of the day but not the least important will cover critical aspects of marketing and selling. The marketing process is about formulating effective strategies to promote the firm's products and how the product should be distributed to customers. Specific selling techniques will be covered oriented to small and medium size business.

Topics covered:

- Principles of Marketing
- Selling lumber
- Developing a marketing plan





More details and registration

Investment is \$100. This includes registration, coffee breaks, and workshop materials. Lunch is on your own.

Please visit the website http://www.cfpb.vt.edu/?page_id=881 to register.

Speakers biographies



Brian H. Bond, Ph.D., serves as a professor and extension specialist in the area of wood products. His focus is on improving the sustainable use and manufacturing of wood products. He has fifteen years experience in wood drying, sawmill performance, and the performance of wood products (flooring, furniture, etc.).



Henry Quesada, Ph.D., is an associate professor at the Department of Sustainable Biomaterials at Virginia Tech. A 2002 and 2004 alumni of Purdue University, Henry works in the areas of Supply Chain Management, Operations Research, International Marketing, Lean Thinking and Environmental Impact. He has been awarded over \$3 million in grants and contracts as principal and co-principal investigator. He has published over 35 peer-reviewed articles. Henry also has served as a consultant for private and public organizations such as USDA-FAS, USAID, Peacework, and Faber Castell. Contact: quesada@vt.edu



Robert Bush, Ph.D. My work involves two related areas: forest products and packaging. Within each, I study marketing and related business functions. I believe that the great majority of students will be employed in positions which require them to understand and use business concepts and incorporate opportunities to gain this knowledge into my courses. I believe that we learn by doing as well as studying. Consequently, my courses incorporate experiential opportunities wherever possible. I enjoy working with both undergraduate and graduate students.



2018 Spring Webinar Series
Presented by WP 5.04.13 at IUFRO
Industrial Engineering, Operation Analysis and Logistics

Coordinator: Henry Quesada (Virginia Tech, USA)

Deputies: Scott Leavengood (Oregon State University, USA), Maria Huka (University of Natural Resources and Life Sciences, Austria), and Judith Gisip (Universiti Teknologi, Malaysia)

Description and schedule

The Industrial Engineering, Operation Analysis and Logistics working party (5.04.13) AT IUFRO is glad to announce a series of webinars scheduled for Spring 2018. **Please MARK YOUR CALENDAR!**

The goal of this webinar series is to present the latest updates on technology and operations management practices impacting the forest products industry. The webinars are free and do not require a registration. If for some reason you cannot participate, a recording of each webinar will be uploaded to the working party web site. The schedule is as follows:

- **Wood procurement. February 6, 2018.** 4-5pm Central European Time (GMT +01:00). WebEx session number 317 786 309
- **Lean logistics:** Value Stream Mapping Applied to the Wood Fiber Supply Chain. **March 20, 2018.** 9-10 pm Eastern Time (GMT -05:00). WebEx session number 310 080 448
- **Statistical Process Control (SPC)** – A Time-Tested Tool for Process Control and Improvement. **April 10, 2018.** 7-8 am Pacific Time (GMT -08:00). WebEx session number 311 570 056
- **Production Management in Forest based industries. May 15, 2018.** 4-5pm Central European Time (GMT +01:00). WebEx session number 318 558 152

Instructions to access WebEx

1. Go to <https://virginiatech.webex.com>
2. Enter the WebEx session number (see above)
3. If this is your first time using WebEx, the platform will ask you to install the WebEx client. It will take a couple of minutes
4. Once you are logged-in, please adjust your microphone and speakers preferences.



Webinars Details

Wood procurement – February 6, 2018. 4-5pm Central European Time (GMT +01:00).



Life Sciences Vienna

Description: This webinar will give a general introduction to the role of procurement in modern management. We will discuss different portfolio models to align the procurement policies. A case study on forest fuel procurement will help us to understand the portfolio approach.

Presenter. Dr. Manfred Gronalt, University Professor, University of Natural Resources and

Lean logistics –Value Stream Mapping Applied to the Wood Fiber Supply Chain. March 20, 2018. 4-5 pm Eastern Time (GMT -05:00).



Description: Value stream mapping (VSM) has been widely used to map manufacturing activities and their metrics but little has been done to adapt this visual tool to logistic operations. This webinar will introduce the main concepts about VSM and a case of study will be presented to show how to apply VSM to the wood fiber supply chain starting with harvesting to log yard operations.

Presenter. Dr. Henry Quesada, Associate Professor and Extension Specialist in the Department of Sustainable Biomaterials, Virginia Tech





Statistical Process Control (SPC) – A Time-Tested Tool for Process Control and Improvement. April 10, 2018. 7-8 am Pacific Time (GMT -08:00).

Description: This webinar will introduce participants to SPC through a case example describing how it was used by a small wood products manufacturer. The case will begin by addressing common questions and objections related to SPC - for example, what's wrong with simply measuring the product and comparing the values to specifications (i.e., do we really need to use statistics)? The presentation will then discuss how SPC was introduced to the case company, how employees were trained, and the results.

Presenter: Dr. Scott Leavengood, Associate Professor and Director, Oregon Wood Innovation Center, Oregon State University.



Production Management in Forest based industries – May 15, 2018. 4-5 pm Central European Time (GMT +01:00).



Description: This webinar introduces participants to various cutting problems from one dimensional to three dimensional which occur in forest based industries. We will discuss alternative objective functions and solve the problems with Excel Solver.

Presenter: Maria Anna Huka, University Assistant, University of Natural Resources and Life Sciences in Vienna

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