**Friday, March 9, 2018, AM**

**Individual paper**

*3D Printing Of Land Surface Model For Undergraduate Teaching And Research*

Yanli Zhang, Daniel Unger, I-Kuai Hung, and David L. Kulhavy
Stephen F. Austin State University

Use of 3D printing technology for digital surface modeling.

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*Closing The Loop On Assessment - Modifying Courses To Ensure Proper Scaffolding Of Core Competencies*

Edward F. Loewenstein
Auburn University; School of Forestry and Wildlife Sciences

Curriculum assessment may not be sufficiently fine grain to identify all of the academic holes in a program. Faculty discussions to identify common problems and solutions are necessary. We must scaffold complex skills and abstract concepts that students need if they are to build professional competency.

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*Connecting Environmental Worldviews, Justice, And The Humanities To Diversity Efforts*

Sativa Cruz, Michael Paul Nelson, Ana Spalding, and Ivan Arismendi
Oregon State University

We will discuss the importance of environmental worldviews as they relate to nondominant narratives about broadening participation of underrepresented groups in environmental and natural resource related fields. Our research will also highlight the potential role of the arts and humanities in efforts to increase diversity.

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*Efforts To Increase Achievement Of Student Learning Goals In Communication In Natural Resources Degree Programs*

Andrew J. Storer and Terry L. Sharik
Michigan Technological University

Discussion with students enrolled in natural resource programs at Michigan Tech identified gaps not being filled adequately by existing classes. A new class taught by a team of nine faculty members was incorporated into the curriculum with for elevating student communications skills as they prepare to enter the workforce.

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*Engaging Students Online: Development Of A Non-traditional Online Course In Maple Syrup Management And Culture Increases Interdisciplinary Undergraduate Enrollment In A Natural Resource Academic Program*

Tara L. Bal
Michigan Technological University

A one-credit, online, blended learning course with a hand-on field day was developed in maple syrup management and culture in 2015. The course has significantly increased interdisciplinary enrollment from students outside of the natural resource unit, highlighting a demand for engaging and flexible course offerings that can be used as recruiting tools.

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*Experiences Of Teaching A Hybrid Silviculture Course*

Thomas J. Dean
Louisiana State University, School of Renewable Natural Resources

A silviculture course was taught as a flipped course where students study the course material between meetings and work on problem sets during classes. Challenges include creating contents that students can learn on their own, developing in-class problems, and creating incentive to learn the material.
Forest Education Competency Analysis Of Recent Graduates: Interview Results From The U.S. Participation In The Global Outlook On Forest Education Project
Tara L. Bal, Dalia Abbas, Terry L. Sharik, Andrew J. Storer, Mika Rekola
Michigan Technological University
A collaboration with the joint IUFRO-IFSA task force on education, this project collected data and stories about recent forestry and natural resource graduate’s professional careers, examining skills and competencies that differentiated successes from non-successes.

Global Outlook On Forest Education (GOFE) - Preliminary Results
Department of Forest Sciences, University of Helsinki
The Global Outlook on Forest Education (GOFE) study examined using the Behavioral Event Interview (BEI) method for identifying recent forest science graduates’ competencies in working life. Leadership and management, human interactions, and communication were emphasized by respondents as important threshold and differentiating competencies, whereas forest subject-specific competencies were not.

Green Mountain State Park: A Simulation For Teaching Park Management Techniques
Michael G. Huffman
University of Memphis
The use of a simulation to teach park management strategies to undergraduate students is presented along with a description of the development of the simulation based on a real park management plan. In addition, student learning outcomes and student evaluations of their learning experiences are discussed.

Inter-institutional Variation In Forestry And Related Natural Resources Programs In The US In Relation To Diversity Perception On Program Websites
Tara L. Bal and Terry L. Sharik
Michigan Technological University
Web sites of colleges with N.R. programs were examined to determine if differences observed in enrollments in race/ethnicity and gender could be explained by the images and text of these websites. Website content likely plays a minor role in enrollment, though there is significant under-representation of minorities and women.

Student Perceptions And Achievement In A First Year Natural Resources Class
Dean F. Stauffer, Jennifer H. Culhane, Kyrille Goldbeck-DeBose, and Donald J. Orth
Dept of Fish and Wildlife Conservation, Virginia Tech
We report on the results of evaluating students across 5 cohorts in a First Year Experience course in Natural Resources. Students made gains in information literacy, and their overall perceptions of the class were positive, with most agreeing that the class helped prepare them for subsequent courses and activities.

Student And Instructor Generated Open Educational Resources Compare Favorably To A Traditional Textbook
Jeremy Stovall, Shelby Laird, Lana Welford, and Allie Williams
Stephen F. Austin State University
A chapter from a well-respected traditional textbook was compared with student and instructor generated open educational resources (OER) using a knowledge assessment and preference survey in two forestry courses. Both resources led to similar knowledge gains and student preference ratings, indicating that this OER resource is an effective learning tool.
Teaching Communications In Forestry: How Are We Doing?
Pat Stephens Williams
Stephen F. Austin State University
How accredited programs are meeting the SAF Communications requirement? Where we were, where we are now, and how some programs are utilizing innovative practices.

The Development And Implementation Of A Professional Master’s Degree For Natural Resource Agency Employees
Chris Luecke and Melanie Conrad
Utah State University
We will describe the development and implementation of an on-line masters degree designed for professionals working in natural resource agencies. The degree became successful when a consortium of universities collaborated on degree offerings. Lessons and pitfalls will be discussed.

The Role Of Accreditation In Natural Resource Programs
Andrew J. Storer, Terry L. Sharik, and Tara L. Bal
Michigan Technological University
This presentation will discuss the value of SAF accreditation of programs in forestry and in Natural Resources and Ecosystem Management by considering the range of knowledge, skills and abilities expected of students graduating from these programs.

Friday, March 9, 2018, PM
Individual paper

An Engagement Tool In Community Planning And Design
Frans Padt
Pennsylvania State University
An Engagement Tool was developed to test student understanding, attitude, and learning regarding engaged scholarship in community planning and design. The results indicate insufficient understanding of engagement and a one-sided expert attitude, but a potential for learning. A dissemination strategy was developed to enhance Penn State’s Engaged Scholarship Initiatives.

Celebrating 20 Years Of Outdoor Environmental Education For Pre-service Teachers At SFASU
John Boyette, Cheryl Boyette, Alan Sowards, and Elyce Rodewald
Texas A&M Forest Service
This talk will describe the long running, successful program, Bugs, Bees, Butterflies, and Blossoms that has been enriching SFA pre-service teachers’ training in unique and effective ways. We will present personal stories of some of the participants and how this program has benefited them.

Connecting Center Directors To Undergraduate Courses To Engage Students In Local, Real World Natural Resource Management
Laurie Gharis
UWSP Wisconsin Center for Environmental Education
This presentation demonstrates specific opportunities and activities to connect undergraduate students to on-going strategic planning, human resource management, conflict resolution, and budget development conducted by local center directors. Linking students to on-site center directors enhances students’ confidence and effectiveness by providing opportunities to assess real world programs and challenges.
Engaging Animal Science Students Through Alternative Learning Methods
Stephen F. Austin State University
Service and experiential learning projects, Breakfast on the Farm, artificial insemination clinic, and Purple Premium Cattle Sale, were incorporated into animal science courses at Stephen F. Austin State University. They have caused students to rate their course experiences higher, retains more course material, and encouraged students to become more active within the community.

Factors That Influence Minority And Urban Student Interest In Natural Resource Careers
Bianca Moreno, Martha Monroe, and Chelsey Crandall
University of Florida
Results from a survey conducted at the University of Florida revealed key considerations for recruiting and retaining females, urban and non-white students. This session explores the factors that led to students’ interest in the environment, why they chose to enroll, and how they feel about the program.

Impacts Of A Two Day Intensive ‘Root Camp’ On Sense Of Belonging And Student Retention
Shelby Gull Laird, John Kidd, Brandy Bishop, and Matthew McBroom
Stephen F. Austin State University
This presentation will discuss ongoing research on retention interventions over the past two years at SFA, focused on retaining freshmen and incoming transfer students.

Integrating Drones Within A Natural Resource Curriculum At Stephen F. Austin State University
Daniel Unger, David Kulhavy, I-Kuai Hung, and Yanli Zhang
Stephen F. Austin State University
At Stephen F. Austin State University researchers are integrating UASs into undergraduate education in senior level spatial science courses via multiple hands-on research projects to assess the ability of a UAS to quantify forest resources in a more accurate and timely manner than in situ assessments.

Integrating Experiential Learning And Student Research Across An Environmental Science Curriculum Using A Comprehensive, Campus-based Forest Management Plan
Emma Witt, Catherine Tredick, George Zimmermann, and Tait Chirenje
Stockton University
This presentation highlights the experiences of faculty using an active forest management area in environmental science courses. Examples of experiential learning activities, assessment methods, and student portfolios will be included in the presentation.

Promoting Sustainable Living Among College Students: Key Programming Components
Brooklynn J. Wynveen, Andrew R. Meyer, and Christopher J. Wynveen
Sam Houston State University
In this presentation, we describe a formative experiment conducted to promote sustainable living within a large community in Texas’ specifically interventions conducted among local college students. We detail methods used for data collection and analysis, outcomes obtained, and key programming components identified for interventions promoting sustainable living among college students.

Strengthening Science Communication And Data Visualization Education In Graduate Students: NAU’s Science Communication Certificate
Andrew Sánchez Meador and Peter Friederici
School of Forestry, Northern Arizona University
This presentation provides a broad overview of Northern Arizona University’s new 15-credit graduate certificate in Science Communication, which includes a Data Metaphors and Visualization course developed and taught in NAU’s Forest Science program. We present motivations, lessons learned, and future direction.
Undergraduate Enrollment Trends In Natural Resources And Environmental Degree Programs In The U.S. With An Emphasis On Diversity: An Update
T. L. Sharik and T. L. Bal
Michigan Technological University
Undergraduate enrollment trends in natural resource (NR) programs of U.S. show Forestry decreased from 50% in 1980 to now 16%. Those fastest growing since 2005 are Fisheries and Wildlife, NR Conservation and Management, and Environmental Science and Studies. Female increases steadily now constitutes 45%. Minority increases more rapidly than Non-Hispanic Caucasian, while remains among the lowest of all higher education study areas.

Using Freewriting As A Learning Tool
Stephen C. Grado
Department of Forestry, Mississippi State University
Since 1995, I teach forest recreation management course for two majors with a term paper requirement. In Fall 2017, I dropped the term paper assignment and replaced it with five Freewriting assignments for the same amount of credit. Writing exercises were introduced as an instructional tool to enhance student learning.

Workshop
PollinatorLIVE! PollinatorLIVE! Bee, Bats Moths, Birds, Flies And Beetles! PollinatorLIVE
David Kulhavy, Miki Lynn Fryar, and Charles Jones
Stephen F. Austin State University
This proposal is for the Friday evening presentation as an interactive presentation of PollinatorLIVE!, a song by David Kulhavy, Miki Lynn Fryar and Charles Jones. The song was presented as a national video with the PollinatorLIVE! program and is used each semester in teaching an interactive insect-disease class as part of the communication presentation. This will be an audience participation workshop with music, dance and interactive learning.

Remember, It’s A Conversation: Creating Meaningful Connections In An Instagram World
Tosha Jupiter and Rob Novak
Warner College of Natural Resources, Colorado State University
Over the last year, Warner College of Natural Resources more than doubled its Instagram following and significantly increased audience engagement. We’ll share our ideas about why this happened and offer tips to help natural resources educators create conversations in an Instagram world.

Revitalizing Natural Resources Core Curriculum: Rubric-based Assessment And Collaborative Design
Margaret Burke, Allan Strong, Walter Poleman, and Alexander Yin
Rubenstein School of Environment and Natural Resources
This workshop will provide an overview of a curriculum revitalization process, curriculum mapping efforts, assessment (design, implementation, & findings), collaborative approaches, challenges, and recommendations revealed through RSENR’s intensive, multi-year revitalization and assessment efforts. An overview of resources and processes utilized will be dedicated to facilitated discussion and Q&A.

The Growth & Success Of A Perennial Cost-shared Internship Program
Anna Smiles-Becker
Rubenstein School of Environment & Natural Resources, University of Vermont
Eager, professional and skilled students working with organizations, companies and agencies finding solutions for critical environmental issues could there be a better match? Learn about the Rubenstein Perennial Internship Program, a successful cost-shared summer internship program.
Individual paper

College Professors’ Perceptions On Entrepreneurship Competence
Sandra Rodriguez-Piñeros, José Carlos Martínez, Liz Villarrag-Flórez
Universidad Autónoma de Chihuahua
Forestry education is facing challenges due to rapid social and environmental changes. Traditional forestry education has been criticized for being timber harvesting oriented while there are other sectors in which foresters could perform well. We use Q methodology to investigate subjective opinions about entrepreneurship competence, 35 forestry professors around Mexico participate in the study.

Curriculum Modification For Student Success And Retention
Michelle Maller
Oregon State University Department of Wood Science and Engineering
The presentation would outline the steps the Wood Science and Engineering Department took to overhaul the curriculum and the learning and departmental objectives that were established to accompany the new curriculum. Also highlighted would be the use of departmental mentors and recruitment strategies that are different than the norm.

Education As A Driver of Change in U.S. Forests and the Forest Sector
T. L. Sharik, A. J. Storer, T. L. Bal and D. Abbas
Michigan Technological University and American University
Education as a driver of change in U.S. forests over the next two decades was examined in relation to a knowledge-creation society powered by information and communication technologies enabling life-long learning with more attention on the environment and better integration of the ecological, social, and economic dimensions of sustainability.

Examining Representation Of Race, Gender, And Environmental Worldviews On Advisory Boards For University Natural Resources Programs
Lucia Hadella, Michael P. Nelson, and Ivan Arismendi
Oregon State University
We observe an overall lack of diversity in race, gender, and representation of environmental worldviews on advisory boards for prominent natural resource programs at universities in the U.S. in our preliminary investigation, which serves as a point of self-reflection for programs looking to increase minority enrollment and address environmental challenges.

Improving Information Literacy In Natural Resource Policy Students’ Position Statement Projects
James P. Shepard and Patricia Hartman
Auburn University
We describe a multi-year collaboration between a faculty member and a librarian to improve information literacy performance by natural resource policy student teams assigned to research and create a position statement about a controversial issue. We designed information literacy exercises and sessions and evaluated performance over multiple semesters.

Natural Resources Without Borders
Shelby Laird, Becky Weems, and Sarah Fuller
Stephen F. Austin State University
The need of a mission group for technical assistance in gardening, farming, and forestry led to a unique partnership between a university and a NGO mission organization working in Haiti. This led to multiple lessons in service learning, cultural competency, and community engagement for university students and their professor.
Population Estimation And Typology Of Undergraduate Research Experience Programs In Natural Resources
John B. Kidd, John R. Seiler, and John F. Munsell
Virginia Tech; Stephen F. Austin State University
This presentation includes dissertation research on the size and structures of undergraduate research experience programs in natural resources disciplines. We present an estimated population size derived from respondent-driven sampling and capture-recapture methods and a typology of programs based on cluster analysis of survey data collected from program coordinators.

Recruitment And Retention Efforts At University And College Levels In Times Of Declining Enrollment With Support From Private Gifted Funds To Facilitate Sustainability
Thomas DeLuca, Elizabeth Dodson, and John Goodburn
University of Montana, Franke College of Forestry & Conservation
The W.A. Franke College of Forestry & Conservation has sharpened its focus on Recruitment and Retention efforts, particularly given enrollment declines in recent years. Associated reductions in state support challenge new investments in recruitment and retention, with some support for recruitment scholarships and retention fellowships available at the College level.

Summer Undergraduate Research Internships On Dendroclimatology: Successes And Lessons Learned
Carolyn A. Copenheaver and Ketia L. Shumaker
Virginia Tech
Undergraduate summer research internships provide opportunity for students to participate in dendroclimatology research project and decide upon an appropriate career pathway.

P. Eric Wiseman, Keith O’Herrin, Greg Dahle, Susan Day, Joe Sullivan, and Joel Koci
Virginia Tech, Dept. of Forest Resources and Environmental Conservation
Urban Forestry 2020 is a multi-institution project funded by the U.S. Forest Service aimed at understanding the urban forestry profession and uncovering strategies to advance the profession. In this presentation, we will summarize the findings of our national research and discuss its implications for urban forestry higher education.

Workshop
Multicultural Scholars Program: Interdisciplinary Training In Research And Leadership For A Sustainable Future
Marie Vea-Fagnant and Flore Costume
Rubenstein School of Environment and Natural Resources, University of Vermont
The Multicultural Scholars Program (MSP) at the Rubenstein School of Environment and Natural Resources, University of Vermont has supported over 40 students from groups that have been historically underrepresented in natural resource programs. Presenters will share the history, design, successes, and challenges of this program including completion of the grant, implementation, and outcomes. With a large focus on experiential learning and professional development, we will also share our experiences with internship, research, and study abroad with our Scholars.
Poster

**Accuracy Comparison Between Unsupervised Land Cover Classifications Using Landsat 8 and Landsat 7 Imagery**
Cheryl Scott, Brandon McBride, Daniel Unger, David Kulhavy, I-Kuai Hung, and Yanli Zhang
Stephen F. Austin State University
Accuracy assessment of land cover map products using the increased radiometric resolution of Landsat 8 data.

**Colorado State University’s SUPER Program: Transforming Undergraduate Research Training**
Stacy J. Lynn
Colorado State University
This poster presents the Skills for Undergraduate Participation in Ecological Research program. This program is offered by Colorado State University, and combines coursework in foundational skills of ecological research success, with research experience with a paired mentor.

**Creating Community Awareness Through An Advocacy Service Learning Project**
Courtney Biles, Erin Brown, Shelby Laird, Stephanie Jones, and Emily Payne
Stephen F. Austin State University
"Breakfast on the Farm" is an experiential and service learning project aimed at increasing agricultural awareness within the Nacogdoches community and at improving the learning experience of students enrolled in the beef cattle course.

**Data Processing To Create Tangible Terrain Models**
Jordan L Scarborough, Will G Russell, Yanli Zhang, I-Kuai Hung, Daniel Unger, and David Kulhavy
Stephen F. Austin State University
Details the process of rendering and printing 3D terrain.

**Landscape Ecology Change In Surface Area Of Lake Mead From 1985 To Present, Clark County, Nevada**
Emily Clontz, David Kulhavy, Daniel Unger, I-Kuai Hung, and Yanli Zhang
Stephen F. Austin State University
Use of Landsat imagery to identify change in surface area of Lake Mead over time.

**Linking Extension, Research And Undergraduate/Graduate Education: A Perspective From Wood Products**
Chris Knowles and Scott Leavengood
Oregon State University
This poster will present two case examples of linking extension, research and undergraduate/graduate education in the field of wood products.

**Pollinators Of The World In Art, Science, Poetry, Language And Exhibition**
David Kulhavy and Charles Jones
Stephen F. Austin State University
A fine press book of Pollinators of the World by Charles Jones, master printer with the La Nana Creek Press and David Kulhavy, Forestry, will integrate art, science, poetry, language and an exhibition for creation of a celebration of the pollinators and the plants they pollinate. The influence of art on natural resource education will be presented as a method of communication. Critical essays and poetry will enhance the learning experience with the collection of the art and science.
Transforming Undergraduate Students: International Research Experience In East Africa
Stacy J. Lynn
Colorado State University
This poster describes an international research program which is hosted by Colorado State University, and which takes five student fellows per year to East Africa to perform interdisciplinary student-driven research projects at the intersection of social and ecological sciences.

UM’s Bandy Ranch: Utilizing A Neglected Property As An Ideal Classroom For Capstone Course Projects And Student
Dodson, Elizabeth, M and Goodburn, John, M
University of Montana
Students of University of Montana were directly involved in management decisions at a ranch of the university. It includes designing road networks, improving fish passage, building bridges, and conducting inventory and management planning. Further, students were pivotal in the development of a major “Forests in Focus” grant proposal.

Using iNaturalist To Learn More About Vertebrates
Christopher Schalk
Stephen F. Austin State University
iNaturalist (http://inaturalist.org), a website that allows users to submit species observations, was used as part of a digital specimen collection assignment in a Vertebrate Natural History course.

Volunteered Geographic Information: Engaging Students Through Crowd Sourcing
I-Kuai Hung, Reid Viegut, Rachel Murray, Dave Kulhavy, Dan Unger, and Yanli Zhang
Stephen F. Austin State University
Students of a geographic information system (GIS) course were instructed to collect field data using their smartphones with an app that was connected to an online database. The product is an interactive web map highlighting the disc golf course of a city park in Nacogdoches, Texas.