ASABE 2019 Annual International Meeting
Marriott Copley Place, Boston Massachusetts
July 7-10, 2019

CALL FOR ABSTRACTS

This document contains the sessions that are available to submit to for the 2019 AIM. The sessions are listed alphabetically by technical community, then by title. To enter your abstract, go to the ASABE AIM submission site and follow the directions on the homepage.

ASE-APPLIED SCIENCE AND ENGINEERING

Title of Session: Carbon Materials: Biochar–Hydrochar–Activated Carbons
Type of Session: Hybrid
Description of Session: Synthesis of carbon materials (designer carbons, Biochars, Hydrochars, and Activated Carbons) from virgin biomass (forestry and agricultural sources) and waste resources (agricultural waste, municipal solid waste, wastes of wood-origin, and other wastes) have gained significant interest in past years. Application of these carbon materials range from remediation and restoration; agriculture, forestry and soils; urban landscapes; water, wastewater and biosolids; energy applications and advanced energy devices (electrochemical applications, fuel cells, and more). This session will cover science and engineering of carbon material characterization for various applications; challenges in commercialization, production and distribution; regulatory policy; human perceptions about carbon material adaptation.
Session Organizer: Kaushlendra Singh, kaushlendra.Singh@mail.wvu.edu
Session Moderator: Kaushlendra Singh, kaushlendra.Singh@mail.wvu.edu
Sponsoring Committee: ASE-16 Engineering for Sustainability
Co-Sponsoring Committee(s): NRES-224 Sediment and Associated Pollutants, NRES-225 Conservation Systems, NRES-265 Soil and Groundwater Remediation, NRES-28 Ecological Engineering, PRS-06 General Program, PRS-280 Bioconversion and Bioprocesses, PRS-701 Physical Properties of Ag & Biological Products, PRS-707 Food & Organic Waste Management & Utilization, ASE-09 Environmental Quality Coordinating, ASE-12 Forest Engineering, ES-100 Energy Systems General Body, ES-210 Renewable Power Generation, ES-220 Biomass Energy & Industrial Byproducts

Title of Session: Case Studies on Forest Access Roads and Stream Crossings
Type of Session: Oral
Description of Session: not available
Session Organizer: Carolyn Jones, Carolyn.Jones@ca.usda.gov
Session Moderator: Carolyn Jones, Carolyn.Jones@ca.usda.gov
Sponsoring Committee: ASE-12 Forest Engineering
Co-Sponsoring Committee(s): NRES-22 Erosion Control Group, NRES-25 Streams, Reservoirs, and Wetlands Group

Title of Session: Engineering for Sustainability POSTER SESSION
Type of Session: Poster
Description of Session: not available
Session Organizer: n/a
Session Moderator: n/a
Sponsoring Committee: n/a
Co-Sponsoring Committee(s): NONE

Title of Session: Forest Biomass Logistics
Type of Session: Oral

Description of Session: not available
Session Organizer: David Lanning, dlanning@forestconcepts.com
Session Moderator: Kamalakanta Sahoo, ksahoo@fs.fed.us
Sponsoring Committee: ASE-12 Forest Engineering
Co-Sponsoring Committee(s): ES-220 Biomass Energy & Industrial Byproducts

Title of Session: Forest Engineering POSTER SESSION
Type of Session: Poster
Description of Session: not available
Session Organizer: n/a
Session Moderator: n/a
Sponsoring Committee: n/a
Co-Sponsoring Committee(s): NONE

Title of Session: Wood-Based Composites and Products
Type of Session: Oral
Description of Session: not available
Session Organizer: David Lanning, dlanning@forestconcepts.com
Session Moderator: Kaushlendra Singh, Kaushlendra.Singh@mail.wvu.edu
Sponsoring Committee: ASE-12 Forest Engineering
Co-Sponsoring Committee(s): ES-220 Biomass Energy & Industrial Byproducts

Title of Session: Woody Biomass Processing and Conversion
Type of Session: Oral
Description of Session: not available
Session Organizer: David Lanning, dlanning@forestconcepts.com
Session Moderator: Catherine Brewer, cbrewer@nmsu.edu
Sponsoring Committee: ASE-12 Forest Engineering
Co-Sponsoring Committee(s): PRS-280 Bioconversion and Bioprocesses, ES-220 Biomass Energy & Industrial Byproducts

EOPD-EDUCATION, OUTREACH, & PROFESSIONAL DEVELOPMENT

Title of Session: Closing the Gap Between Theory and Practice: Teaching and Curriculum
Type of Session: Oral
Description of Session: A longtime strength of our discipline is in educating students in practical application of theory. We would like to hear from people at the forefront of maintaining this legacy of integrated training in theory and practice.
Session Organizer: Amy Kaleita, kaleita@iastate.edu
Session Moderator: Laura Merriman, lsmerrim@ncsu.edu
Sponsoring Committee: EOPD-203 Undergraduate & Graduate Instruction
Co-Sponsoring Committee(s): NONE

Title of Session: Educational Approaches for Facilitating Digital Agriculture
Type of Session: Hybrid
Description of Session: Digital Ag, Smart Ag, Ag Informatics - these are just a handful of themes in the emerging area of data and information science in agriculture. Our education programs should be building student capacity in this area, but

as an emerging field there are no textbooks or established syllabi to follow. Now is a good time for our community to share ideas, successes, and failures in this area.
Session Organizer: Amy Kaleita, kaleita@iastate.edu
Session Moderator: Luis Rodriguez, lfr@illinois.edu
Sponsoring Committee: EOPD-203 Undergraduate & Graduate Instruction
Co-Sponsoring Committee(s): NONE

Title of Session: Innovations in Education - Technology, Engineering, Undergraduate and Graduate
Type of Session: Oral
Description of Session: This catch-all session provides an opportunity for innovators to share cutting edge practices and ideas across the range of education themes.
Session Organizer: Amy Kaleita, kaleita@iastate.edu
Session Moderator: Amy Kaleita, kaleita@iastate.edu
Sponsoring Committee: EOPD-203 Undergraduate & Graduate Instruction
Co-Sponsoring Committee(s): NONE

Title of Session: Showcasing Blue Ribbon Publications
Type of Session: Oral
Description of Session: Blue ribbons are presented to those authors who have produced extension publications in nine different categories. This session will be used to showcase past winners of Blue Ribbon Awards and provide other members of ASABE a glimpse of the work Extension ASABE members.
Session Organizer: Gary Hawkins, ghawkins@uga.edu
Session Moderator: Gary Hawkins, ghawkins@uga.edu
Sponsoring Committee: EOPD-208 Extension
Co-Sponsoring Committee(s): NONE

ES-ENERGY SYSTEMS

Title of Session: Advanced and Drop-In Biofuels Production-Biochemical Approach
Type of Session: Oral
Description of Session: Biochemical approaches for producing drop-in fuels beyond ethanol and biodiesel.
Session Organizer: Sushil Adhikari, sza0016@auburn.edu
Session Moderator: Yi Wang, yiwang3@auburn.edu
Sponsoring Committee: ES-220 Biomass Energy & Industrial Products
Co-Sponsoring Committee(s): PRS-280 Bioconversion and Bioprocesses

Title of Session: Advances in Biomass Preprocessing
Type of Session: Oral
Description of Session: Mechanical preprocessing and chemical and thermal pretreatments to improve biomass physical, chemical and energy properties for biochemical and thermochemical conversions
Session Organizer: Sushil Adhikari, sza0016@auburn.edu
Session Moderator: Jaya Shankar Tumuluru, Jayashankar.Tumuluru@inl.gov
Sponsoring Committee: ES-220 Biomass Energy & Industrial Products
Co-Sponsoring Committee(s): MS-23/7/2 Forage & Biomass Engineering, ASE-12 Forest Engineering

Title of Session: Advances in Lignin Valorization

Type of Session: Oral
Description of Session: Lignin is one of the three main building blocks of lignocellulosic biomass. Despite its great potential to a wide range of applications, lignin is yet an underutilized substrate, and under the current bio-refinery concept, lignin is commonly burned to generate steam and electricity. Converting lignin waste streams to high value-added products offers a significant opportunity to improve the overall processing efficiency, economic viability, and sustainability of a biorefinery, thus enabling cost-competitive biofuels production. This technical session provides a forum for presentation of innovative research results and ideas related to the lignin conversion. Topics covered under this session include lignin extraction, characterization and depolymerization, and biological and thermochemical upgrading of lignin to specific products.
Session Organizer: Sushil Adhikari, sza0016@auburn.edu
Session Moderator: Jian Shi, j.shi@uky.edu
Sponsoring Committee: ES-220 Biomass Energy & Industrial Products
Co-Sponsoring Committee(s): PRS-280 Bioconversion and Bioprocesses, ESH-03/1 External Standard Development, NONE

Title of Session: Biofuel Production POSTER SESSION
Type of Session: Poster
Description of Session: not available
Session Organizer: Sushil Adhikari, sza0016@auburn.edu
Session Moderator: Ganti Murthy, murthyg@oregonstate.edu
Sponsoring Committee: ES-220 Biomass Energy & Industrial Products
Co-Sponsoring Committee(s): MS-23/7/2 Forage & Biomass Engineering, PRS-701 Physical Properties of Ag & Biological Products, ASE-12 Forest Engineering, ES-01 POSTER SESSION

Title of Session: Biomass Feedstock Supply Logistics and Modeling
Type of Session: Oral
Description of Session: Biomass harvest, collection, preprocessing, handling, transport, and supply chain interactions from field to factory. Field activities as well as mathematical modeling of these processes.
Session Organizer: Sushil Adhikari, sza0016@auburn.edu
Session Moderator: Igathinathane Cannayen, Igathinathane.Cannayen@ndsu.edu
Sponsoring Committee: ES-220 Biomass Energy & Industrial Products
Co-Sponsoring Committee(s): ASE-12 Forest Engineering

Title of Session: Biomass Processing POSTER SESSION
Type of Session: Poster
Description of Session: not available
Session Organizer: Sushil Adhikari, sza0016@auburn.edu
Session Moderator: Ganti Murthy, murthyg@oregonstate.edu
Sponsoring Committee: ES-220 Biomass Energy & Industrial Products
Co-Sponsoring Committee(s): MS-23/7/2 Forage & Biomass Engineering, PRS-701 Physical Properties of Ag & Biological Products, ASE-12 Forest Engineering, ES-01 POSTER SESSION

Title of Session: Energy Utilization and Lighting in Agricultural Operations and Facilities
Type of Session: Oral
Description of Session: Presentations on energy use or efficiency for agricultural facility and operations – greenhouses, livestock facilities, food processing, feed processing, grain drying, energy benchmarking, new technologies.
Session Organizer: Scott Sanford, sasanford@wisc.edu

Session Moderator: Kip Pheil, kenneth.pheil@por.usda.gov
Sponsoring Committee: ES-300 Energy Utilization & Application
Co-Sponsoring Committee(s): ES-310 Ag Lighting Group, ES-311 Electromagnetic Radiation Application for Plants

Title of Session: Lighting Systems POSTER SESSION
Type of Session: Poster
Description of Session: not available
Session Organizer: Sushil Adhikari, sza0016@auburn.edu
Session Moderator: Ganti Murthy, murthyg@oregonstate.edu
Sponsoring Committee: ES-220 Biomass Energy & Industrial Products
Co-Sponsoring Committee(s): MS-23/7/2 Forage & Biomass Engineering, PRS-701 Physical Properties of Ag & Biological Products, ASE-12 Forest Engineering, ES-01 POSTER SESSION

Title of Session: Production, Processing and Conversion of Algae
Type of Session: Oral
Description of Session: Cultivation (open raceway, photobioreactors, marine land), harvesting, drying (low temperature drying, solar vs thermal drying), processing (protein/lipid extraction) and conversion (pelleting, liquefaction, anerobic digestion etc.) of micro and macro algae for biofuels and non-food/feed applications.
Session Organizer: Sushil Adhikari, sza0016@auburn.edu
Session Moderator: Brendan Higgins, bth0023@auburn.edu
Sponsoring Committee: ES-220 Biomass Energy & Industrial Products
Co-Sponsoring Committee(s): PRS-280 Bioconversion and Bioprocesses, PRS-707 Food & Organic Waste Management & Utilization

Title of Session: Renewable Energy Resources and Technologies
Type of Session: Oral
Description of Session: not available
Session Organizer: Sarah Wu, xwu@uidaho.edu
Session Moderator: Hongjian Wu, littlexiao@gmail.com
Sponsoring Committee: ES-210 Renewable Power Generation Committee
Co-Sponsoring Committee(s): NONE

Title of Session: Renewable Energy Resources POSTER SESSION
Type of Session: Poster
Description of Session: not available
Session Organizer: Sushil Adhikari, sza0016@auburn.edu
Session Moderator: Ganti Murthy, murthyg@oregonstate.edu
Sponsoring Committee: ES-220 Biomass Energy & Industrial Products
Co-Sponsoring Committee(s): MS-23/7/2 Forage & Biomass Engineering, PRS-701 Physical Properties of Ag & Biological Products, ASE-12 Forest Engineering, ES-01 POSTER SESSION

Title of Session: Techno-Economic and Life Cycle Assessment of Biomass Conversion
Type of Session: Oral
Description of Session: This session invites abstracts dealing with sustainability analysis using process modeling or life cycle assessment of agricultural and bioenergy systems, including production of biofuels, energy, bio-products, bio-feedstocks. Abstracts related to LCA methodologies and assumptions affecting the results are also welcomed.

Session Organizer: Sushil Adhikari, sza0016@auburn.edu
Session Moderator: Deepak Kumar, kumard@illinois.edu
Sponsoring Committee: ES-220 Biomass Energy & Industrial Products
Co-Sponsoring Committee(s): PRS-280 Bioconversion and Bioprocesses

Title of Session: Thermochemical Conversions of Biomass
Type of Session: Oral
Description of Session: Catalytic and thermochemical conversion of biomass to fuels, intermediate products and/or chemicals via processes such as torrefaction, pyrolysis, gasification and liquefaction.
Session Organizer: Sushil Adhikari, sza0016@auburn.edu
Session Moderator: Sandun Fernando, sfernando@tamu.edu
Sponsoring Committee: ES-220 Biomass Energy & Industrial Products
Co-Sponsoring Committee(s): NONE

Title of Session: Value-Added Chemicals and Products from Biomass
Type of Session: Oral
Description of Session: Value-added chemicals and products from biobased resources through biochemical, catalytic, thermochemical and hybrid conversion routes.
Session Organizer: Sushil Adhikari, sza0016@auburn.edu
Session Moderator: Sushil Adhikari, sza0016@auburn.edu
Sponsoring Committee: ES-220 Biomass Energy & Industrial Products
Co-Sponsoring Committee(s): NONE

ESH-ERGONOMICS, SAFETY, & HEALTH

Title of Session: Ergonomics, Safety, & Health POSTER SESSION
Type of Session: Poster
Description of Session: Posters on advancements, innovations, and research findings related to ergonomics, safety, and health in agricultural systems.
Session Organizer: Gretchen Mosher, gamosher@iastate.edu
Session Moderator: Gretchen Mosher, gamosher@iastate.edu
Sponsoring Committee: ESH-01 POSTER SESSION
Co-Sponsoring Committee(s): NONE

Title of Session: Safety Considerations in Agriculture
Type of Session: Oral
Description of Session: New innovations in worker safety in agricultural settings and with agricultural equipment; Methods for enhancing worker safety, characterization and surveillance of agricultural safety incidents, application of tools and analysis to improve occupational safety outcomes for workers.
Session Organizer: Gretchen Mosher, gamosher@iastate.edu
Session Moderator: Gretchen Mosher, gamosher@iastate.edu
Sponsoring Committee: ESH-04 Technology Exchange
Co-Sponsoring Committee(s): ESH-04/1 Journal of Agricultural Safety and Health

Title of Session: Strategies for Safety Communication and Education
Type of Session: Oral

Description of Session: Sessions focused on education and communication strategies for dissemination of agricultural safety and health information. Research and best practice-oriented presentation abstracts will be accepted on formal and informal education environments.
Session Organizer: Gretchen Mosher, gamosher@iastate.edu
Session Moderator: Gretchen Mosher, gamosher@iastate.edu
Sponsoring Committee: ESH-04/1 Journal of Agricultural Safety and Health
Co-Sponsoring Committee(s): EOPD-205 Engineering Technology & Management Education, EOPD-208 Extension, ESH-04/1 Journal of Agricultural Safety and Health

ITSC-INFORMATION TECHNOLOGY, SENSORS & CONTROL SYSTEMS

Title of Session: 3D Machine Vision for Sensing and Automation
Type of Session: Oral
Description of Session: not available
Session Organizer: Seung Chul Yoon, SeungChul.Yoon@ARS.USDA.GOV
Session Moderator: Seung Chul Yoon, SeungChul.Yoon@ARS.USDA.GOV
Sponsoring Committee: ITSC-312 Machine Vision
Co-Sponsoring Committee(s): NONE

Title of Session: Advanced Computational Approaches for Solving Agricultural and Biological Engineering Problems
Type of Session: Oral
Description of Session: This session was offered and well received at the past AIM and was selected by the executive committee to carry it forward.
Session Organizer: Nourredine Abdoulmoumine, nabdoulm@gmail.com
Session Moderator: Nourredine Abdoulmoumine, nabdoulm@gmail.com
Sponsoring Committee: ITSC-217 Computational Methods, Simulations & Applications
Co-Sponsoring Committee(s): NRES-244 Irrigation Management, NRES-265 Soil and Groundwater Remediation, ITSC-230 Biosensors

Title of Session: Advances in Instrumentation and Control Systems
Type of Session: Oral
Description of Session: This is a generic session and provides sort of a catch-all for research that doesn't fit well in more specific sessions. It has been well attended in the past.
Session Organizer: Aaron Franzen, Aaron.Franzen@sdstate.edu
Session Moderator: Aaron Franzen, Aaron.Franzen@sdstate.edu
Sponsoring Committee: ITSC-353 Instrumentation & Controls
Co-Sponsoring Committee(s): MS-48 Specialty Crop Engineering, MS-54 Precision Agriculture, MS-58 Agricultural Equipment Automation, MS-60 Unmanned Aerial Systems, ITSC-318 Mechatronics & Biorobotics

Title of Session: Advances in Spectroscopy and Hyperspectral Properties of Biological Products
Type of Session: Oral
Description of Session: This is an advanced ongoing research field.
Session Organizer: Igathinathane Cannayen, Igathinathane.Cannayen@ndsu.edu
Session Moderator: Jianwei Qin, jianwei.qin@ars.usda.gov
Sponsoring Committee: ITSC-348 Electromagnetics & Spectroscopy
Co-Sponsoring Committee(s): PRS-701 Physical Properties of Ag & Biological Products

Title of Session: Apps in Agricultural Applications
Type of Session: Oral
Description of Session: Mobile and web apps are becoming a common place tool in agriculture. This session discusses their use, design, and compatibility.
Session Organizer: Mario R. Mondaca, mondacaduart@wisc.edu
Session Moderator: Mario R. Mondaca, mondacaduart@wisc.edu
Sponsoring Committee: ITSC-254 Emerging Information Systems
Co-Sponsoring Committee(s): NONE

Title of Session: Big Data and Data Analysis for Agricultural Applications
Type of Session: Oral
Description of Session: New technologies are generating more data that can be handled by producers. This session deals with informing sizes of databases, methods for handling and communicating, and ways to better inform producers on how to use and share their data.
Session Organizer: Mario R. Mondaca, mondacaduart@wisc.edu
Session Moderator: Mario R. Mondaca, mondacaduart@wisc.edu
Sponsoring Committee: ITSC-254 Emerging Information Systems
Co-Sponsoring Committee(s): NONE

Title of Session: Biosensor and Bioelectronics
Type of Session: Oral
Description of Session: Biosensors and bio-sensing devices can be used to detect plant and human pathogens, as well as analytes of interest to the food and agricultural industries. This field of research has produced tens of thousands of research papers that cover a multitude of sensing and transduction platforms. Furthering this research and translating it into practical applications is crucial to benefiting industry. The proposed session(s) will discuss new fundamental and applied research.
Session Organizer: Jose Reyes-De-Corcuera, jireyes@uga.edu
Session Moderator: Jose Reyes-De-Corcuera, jireyes@uga.edu
Sponsoring Committee: ITSC-230 Biosensors
Co-Sponsoring Committee(s): ITSC-353 Instrumentation & Controls

Title of Session: Cloud Computing and Internet of Things in Agriculture
Type of Session: Oral
Description of Session: Many sensors and technology in agricultural applications are incorporating to cloud data storage services. Research is still new and the topic is very relevant to the current state of agriculture.
Session Organizer: Mario Mondaca, mondacaduart@wisc.edu
Session Moderator: Hasan Seyyedhasani, hshasani@ucdavis.edu
Sponsoring Committee: ITSC-254 Emerging Information Systems
Co-Sponsoring Committee(s): ITSC-217 Computational Methods, Simulations & Applications

Title of Session: Computational Fluid Dynamics (CFD) Applications in Agriculture
Type of Session: Oral
Description of Session: The computational Fluid Dynamics (CFD) approach has been used widely in agricultural and biological systems engineering in recent years. After a few decades of research and development and experimental validation, along with a rapid advancement in computing hardware technology, CFD has become an important design and modeling tool for engineers and researchers working in major agricultural engineering fields to develop more accurately predict such phenomena as microclimates inside greenhouses, air flow and temperature control inside animal

housing, the droplet distribution patterns produced by sprayers, the gas plumes emitted from agricultural production facilities, and the insulating performance of post-frame agricultural buildings. CFD has also been used to simulate the reduction of fugitive dust control, anaerobic digester design, and algae biofuel production, to name a few. This session invites the topics related to applications of CFD in efforts to analyze heat and mass transfer phenomena, solve fluid flow problems, and optimize engineering designs in the agricultural, biosystems and environmental engineering fields.
Session Organizer: Christopher Choi, cchoi22@wisc.edu
Session Moderator: Christopher Choi, cchoi22@wisc.edu
Sponsoring Committee: ITSC-217 Computational Methods, Simulations & Applications
Co-Sponsoring Committee(s): PAFS-40 Facilities & Systems Group, ITSC-254 Emerging Information Systems

Title of Session: Discrete Element Modelling (DEM) Applications in Agriculture
Type of Session: Oral
Description of Session: This is an expanding area of research that is becoming mainstream for engineers. Much benefit can be gained by engineers sharing their calibration and validation techniques across a range of applications.
Session Organizer: John Fielke, john.fielke@unisa.edu.au
Session Moderator: John Fielke, john.fielke@unisa.edu.au
Sponsoring Committee: ITSC-217 Computational Methods, Simulations & Applications
Co-Sponsoring Committee(s): MS-45 Soil-Plant-Machine Dynamics

Title of Session: Imaging Technologies for High Throughput Phenotyping
Type of Session: Oral
Description of Session: not available
Session Organizer: Haiyan Cen, hycen@zju.edu.cn
Session Moderator: Haiyan Cen, hycen@zju.edu.cn
Sponsoring Committee: ITSC-312 Machine Vision
Co-Sponsoring Committee(s): MS-48 Specialty Crop Engineering, ITSC-348 Electromagnetics & Spectroscopy

Title of Session: Machine Vision Applications in Agriculture and Food
Type of Session: Oral
Description of Session: not available
Session Organizer: Yan-Fu Kuo, ykuo@ntu.edu.tw
Session Moderator: Yan-Fu Kuo, ykuo@ntu.edu.tw
Sponsoring Committee: ITSC-312 Machine Vision
Co-Sponsoring Committee(s): NONE

Title of Session: Machine Vision for Precision Agriculture and Robotics
Type of Session: Oral
Description of Session: not available
Session Organizer: Daeun Choi, dxc519@psu.edu
Session Moderator: Daeun Choi, dxc519@psu.edu
Sponsoring Committee: ITSC-312 Machine Vision
Co-Sponsoring Committee(s): MS-54 Precision Agriculture

Title of Session: Robotics and Co-Robotics for Agriculture
Type of Session: Oral

Description of Session: This session is intended to cover novel robotic and ancillary systems to support automation of tasks related to agricultural management and production
Session Organizer: Daoliang Li, dliangl@cau.edu.cn
Session Moderator: Daniel Jenkins, danielje@hawaii.edu
Sponsoring Committee: ITSC-318 Mechatronics and Robotics
Co-Sponsoring Committee(s): NONE

Title of Session: Sensors, Automation, and Computation Systems for Agriculture and the Environment POSTER SESSION
Type of Session: Poster
Description of Session: not available
Session Organizer: Daniel Jenkins, danielje@hawaii.edu
Session Moderator: Daniel Jenkins, danielje@hawaii.edu
Sponsoring Committee: ITSC-01
Co-Sponsoring Committee(s): NONE

Title of Session: Teaching Instrumentation and Control to Engineers and Technology Students
Type of Session: Oral
Description of Session: ITSC-353 would like to provide a forum for faculty to share teaching advances, and invite industry to guide future teaching objectives.
Session Organizer: Aaron Franzen, Aaron.Franzen@sdstate.edu
Session Moderator: Aaron Franzen, Aaron.Franzen@sdstate.edu
Sponsoring Committee: ITSC-353 Instrumentation & Controls
Co-Sponsoring Committee(s): EOPD-203 Undergraduate & Graduate Instruction

Title of Session: UAV for Sensing, Imaging, and Agricultural Aquacultural Applications
Type of Session: Oral
Description of Session: This session is intended to cover applications of UAVs for gathering and analyzing imagery data in agricultural and natural systems, as well as emerging uses for precision application of chemicals
Session Organizer: Daoliang Li, dliangl@cau.edu.cn
Session Moderator: Daniel Jenkins, danielje@hawaii.edu
Sponsoring Committee: ITSC-318 Mechatronics and Robotics
Co-Sponsoring Committee(s): NONE

MS-MACHINERY SYSTEMS

Title of Session: Advances in Cotton Engineering
Type of Session: Oral
Description of Session: The main focus of the Advances in Cotton Engineering Session is research and work focused on advancing cotton production, processing, and ginning. Authors doing work in cotton which is focused around engineering are encouraged to submit to the session.
Session Organizer: Wesley Porter, wporter@uga.edu
Session Moderator: Wesley Porter, wporter@uga.edu
Sponsoring Committee: MS-23/7/3 Cotton Engineering
Co-Sponsoring Committee(s): NONE

Title of Session: Advances in Tillage, Seeding, and Transplanting Technology POSTER SESSION

Type of Session: Poster
Description of Session: not available
Session Organizer: Yiannis Ampatzidis, i.ampatzidis@ufl.edu
Session Moderator: Long He, luh378@psu.edu
Sponsoring Committee: MS-48 Specialty Crop Engineering
Co-Sponsoring Committee(s): MS-54 Precision Agriculture, ITSC-318 Mechatronics & Biorobotics

Title of Session: Agricultural Equipment Automation POSTER SESSION
Type of Session: Poster
Description of Session: The ASABE MS-48 Specialty Crop Engineering committee decided to propose this poster session for 2019.
Session Organizer: Yiannis Ampatzidis, i.ampatzidis@ufl.edu
Session Moderator: Long He, luh378@psu.edu
Sponsoring Committee: MS-48 Specialty Crop Engineering
Co-Sponsoring Committee(s): MS-54 Precision Agriculture, ITSC-318 Mechatronics & Biorobotics

Title of Session: Automated Agricultural Field Machinery Data Collection, Analysis, and Utilization
Type of Session: Oral
Description of Session: This is a broad section with strong participation in the past
Session Organizer: Aaron Franzen, Aaron.Franzen@sdstate.edu
Session Moderator: Aaron Franzen, Aaron.Franzen@sdstate.edu
Sponsoring Committee: MS-58 Agricultural Equipment Automation
Co-Sponsoring Committee(s): MS-54 Precision Agriculture, ITSC-353 Instrumentation & Controls

Title of Session: Automation and Robotics for Fruit, Vegetables, and Other Specialty Crops
Type of Session: Oral
Description of Session: The ASABE MS-48 Specialty Crop Engineering committee decided to continue this session for 2019.
Session Organizer: Yiannis Ampatzidis, i.ampatzidis@ufl.edu
Session Moderator: Yiannis Ampatzidis, i.ampatzidis@ufl.edu
Sponsoring Committee: MS-48 Specialty Crop Engineering
Co-Sponsoring Committee(s): MS-54 Precision Agriculture, ITSC-318 Mechatronics & Biorobotics

Title of Session: Automation Systems for Agricultural Field Machinery
Type of Session: Oral
Description of Session: This has been a well attended session for multiple years
Session Organizer: Aaron Franzen, Aaron.Franzen@sdstate.edu
Session Moderator: Aaron Franzen, Aaron.Franzen@sdstate.edu
Sponsoring Committee: MS-58 Agricultural Equipment Automation
Co-Sponsoring Committee(s): ITSC-318 Mechatronics & Biorobotics, ITSC-353 Instrumentation & Controls

Title of Session: Biomass Feedstock Supply Logistics and Modeling
Type of Session: Oral
Description of Session: Allow individuals to continue to present their modeling research for biomass supply chains.
Session Organizer: Elizabeth Miller, millerelizabetha@johndeere.com
Session Moderator: Elizabeth Miller, millerelizabetha@johndeere.com

Sponsoring Committee: MS-23/7/2 Forage & Biomass Engineering
Co-Sponsoring Committee(s): NONE

Title of Session: Cotton Engineering POSTER SESSION
Type of Session: Poster
Description of Session: not available
Session Organizer: Yiannis Ampatzidis, i.ampatzidis@ufl.edu
Session Moderator: Long He, luh378@psu.edu
Sponsoring Committee: MS-48 Specialty Crop Engineering
Co-Sponsoring Committee(s): MS-54 Precision Agriculture, ITSC-318 Mechatronics & Biorobotics

Title of Session: Crop and Soil Sensing
Type of Session: Oral
Description of Session: This has become of the most critical topics providing researchers insight into important aspect of crop production.
Session Organizer: Ajay Sharda, asharda@ksu.edu
Session Moderator: Lav Khot, lav.khot@wsu.edu
Sponsoring Committee: MS-54 Precision Agriculture
Co-Sponsoring Committee(s): MS-45 Soil-Plant-Machine Dynamics

Title of Session: Crop and Soil Sensing POSTER SESSION
Type of Session: Poster
Description of Session: not available
Session Organizer: Yiannis Ampatzidis, i.ampatzidis@ufl.edu
Session Moderator: Long He, luh378@psu.edu
Sponsoring Committee: MS-48 Specialty Crop Engineering
Co-Sponsoring Committee(s): MS-54 Precision Agriculture, ITSC-318 Mechatronics & Biorobotics

Title of Session: Data Management for Precision Agricluture
Type of Session: Oral
Description of Session: Data and data management for precision ag is the next most challenges yet rewarding area of research and solution would provide the knowledge for implementing decisions and decision support systems
Session Organizer: Ajay Sharda, asharda@ksu.edu
Session Moderator: Elizabeth Hawkins, hawkins.301@osu.edu
Sponsoring Committee: MS-54 Precision Agriculture
Co-Sponsoring Committee(s): MS-49 Crop Production Systems, Machinery, and Logistics

Title of Session: Farm Machinery
Type of Session: Hybrid
Description of Session: New technique for simulation aerodynamic separating machine
Session Organizer: Mahmoud Elemam, mahmoudemam46@yahoo.com
Session Moderator: Mahmoud Elemam, mahmoudemam46@yahoo.com
Sponsoring Committee: MS-23/7/1 Grain Harvesting
Co-Sponsoring Committee(s): ITSC-217 Computational Methods, Simulations & Applications, MS-03 Machine Systems Standards Oversight

Title of Session: Forage and Biomass Engineering POSTER SESSION
Type of Session: Poster
Description of Session: not available
Session Organizer: Yiannis Ampatzidis, i.ampatzidis@ufl.edu
Session Moderator: Long He, luh378@psu.edu
Sponsoring Committee: MS-48 Specialty Crop Engineering
Co-Sponsoring Committee(s): MS-54 Precision Agriculture, ITSC-318 Mechatronics & Biorobotics

Title of Session: Handling, Storage, Transport and Processing of Forages and Biomasses
Type of Session: Oral
Description of Session: There is continuing work in the storage, handling, transportation and processing of forages. This topic will allow individuals to provide insights from their research.
Session Organizer: Elizabeth Miller, millerelizabetha@johndeere.com
Session Moderator: Elizabeth Miller, millerelizabetha@johndeere.com
Sponsoring Committee: MS-23/7/2 Forage & Biomass Engineering
Co-Sponsoring Committee(s): NONE

Title of Session: Innovations in Precision Agriculture
Type of Session: Oral
Description of Session: Precision ag has continue to evolve and is a very important topics of research for continually increasing ag production and practices.
Session Organizer: Ajay Sharda, asharda@ksu.edu
Session Moderator: Dharmendra Saraswat, saraswat@purdue.edu
Sponsoring Committee: MS-54 Precision Agriculture
Co-Sponsoring Committee(s): MS-23/6/1 Liquid Materials Application

Title of Session: ISO Standards Training
Type of Session: Oral
Description of Session: ANSI will be providing training on ISO standards development
Session Organizer: Nathan Turnis, TurnisNathanD@JohnDeere.com
Session Moderator: Nathan Turnis, TurnisNathanD@JohnDeere.com
Sponsoring Committee: MS-23 & US TAG ISO/TC23
Co-Sponsoring Committee(s): NONE

Title of Session: Machinery Data and Task Optimization
Type of Session: Oral
Description of Session: The main focus of the Machinery Data & Task Optimization is research and topics which focus on the utilization of machine and implement data for optimizing agricultural operations. These data may include any data which cover any field operations in the agricultural field, manipulation and modelling of these data, or interpretation of this type of data.
Session Organizer: Brian Luck, bluck@wisc.edu
Session Moderator: Brian Luck, bluck@wisc.edu
Sponsoring Committee: MS-49 Crop Production Systems, Machinery, and Logistics
Co-Sponsoring Committee(s): MS-45 Soil-Plant-Machine Dynamics, NONE

Title of Session: Mechanization of Industrial Hemp Harvesting
Type of Session: Oral
Description of Session: Opportunity to share/expand the knowledge of the new crop and how growers are approaching harvesting.
Session Organizer: Elizabeth Miller, millerelizabetha@johndeere.com
Session Moderator: Elizabeth Miller, millerelizabetha@johndeere.com
Sponsoring Committee: MS-23/7/2 Forage & Biomass Engineering
Co-Sponsoring Committee(s): NONE

Title of Session: New Forage Harvesting Methods
Type of Session: Oral
Description of Session: The session will provide an opportunity to share new methods that are being developed for forage harvesting.
Session Organizer: Elizabeth Miller, millerelizabetha@johndeere.com
Session Moderator: Elizabeth Miller, millerelizabetha@johndeere.com
Sponsoring Committee: MS-23/7/2 Forage & Biomass Engineering
Co-Sponsoring Committee(s): NONE

Title of Session: Pesticide and Fertilizer Application Technology POSTER SESSION
Type of Session: Poster
Description of Session: not available
Session Organizer: Yiannis Ampatzidis, i.ampatzidis@ufl.edu
Session Moderator: Long He, luh378@psu.edu
Sponsoring Committee: MS-48 Specialty Crop Engineering
Co-Sponsoring Committee(s): MS-54 Precision Agriculture, ITSC-318 Mechatronics & Biorobotics

Title of Session: Pesticide and Fertilizer Application Technology, Formulation, and Environmental Effects
Type of Session: Oral
Description of Session: application technologies continue to advance to meet the needs of produces and society to protect the environment.
Session Organizer: Chris Bursiek, bursiekchristophere@JohnDeere.com
Session Moderator: Adam Barlow, BarlowAdamJ@JohnDeere.com
Sponsoring Committee: MS-23/6 Application Sys & US TAG ISO TC23/SC6
Co-Sponsoring Committee(s): MS-54 Precision Agriculture

Title of Session: Precision Aerial Spray Applications: UAV/Drones and Manned Aircraft
Type of Session: Oral
Description of Session: aerial application continues to grow in interest and is a lot of research taking place on the systems
Session Organizer: Chris Bursiek, bursiekchristophere@johndeere.com
Session Moderator: Chris Bursiek, bursiekchristophere@johndeere.com
Sponsoring Committee: MS-23/6 Application Sys & US TAG ISO TC23/SC6
Co-Sponsoring Committee(s): MS-54 Precision Agriculture, MS-60 Unmanned Aerial Systems

Title of Session: Precision Ag in Forage and Biomass Production
Type of Session: Oral

Description of Session: This session will allow an opportunity to discuss precision ag applications to the forage and biomass industry and possibly identify areas that can be improved.
Session Organizer: Elizabeth Miller, millerelizabetha@johndeere.com
Session Moderator: Elizabeth Miller, millerelizabetha@johndeere.com
Sponsoring Committee: MS-23/7/2 Forage & Biomass Engineering
Co-Sponsoring Committee(s): NONE

Title of Session: Precision Agricluture POSTER SESSION
Type of Session: Poster
Description of Session: not available
Session Organizer: Yiannis Ampatzidis, i.ampatzidis@ufl.edu
Session Moderator: Long He, luh378@psu.edu
Sponsoring Committee: MS-48 Specialty Crop Engineering
Co-Sponsoring Committee(s): MS-54 Precision Agriculture, ITSC-318 Mechatronics & Biorobotics

Title of Session: Precision Agricultural Utilization in Chemical and Fertilizer Applications
Type of Session: Oral
Description of Session: material application is a growing interest for precision application to increase productivity and protect invironment
Session Organizer: Chris Bursiek, bursiekchristophere@johndeere.com
Session Moderator: Chris Bursiek, bursiekchristophere@johndeere.com
Sponsoring Committee: MS-23/6 Application Sys & US TAG ISO TC23/SC6
Co-Sponsoring Committee(s): MS-54 Precision Agriculture, MS-60 Unmanned Aerial Systems

Title of Session: Precision Application of Chemicals and Fertilizers
Type of Session: Oral
Description of Session: This area is very vital for environmental stewardship and safe and judicious use of chemicals for production agriculture.
Session Organizer: Ajay Sharda, asharda@ksu.edu
Session Moderator: Daniel Martin, dan.martin@ars.usda.gov
Sponsoring Committee: MS-54 Precision Agriculture
Co-Sponsoring Committee(s): MS-23/6/1 Liquid Materials Application, MS-60 Unmanned Aerial Systems

Title of Session: Soil Tillage, Traction and Compaction
Type of Session: Oral
Description of Session: not available
Session Organizer: Meharit Tekeste, mtekeste@iastate.edu
Session Moderator: Meharit Tekeste, mtekeste@iastate.edu
Sponsoring Committee: MS-45 Soil-Plant-Machine Dynamics
Co-Sponsoring Committee(s): MS-49 Crop Production Systems, Machinery, and Logistics, MS-54 Precision Agriculture

Title of Session: Soil-Plant-Machine Dynamics and Systems Simulation
Type of Session: Oral
Description of Session: not available
Session Organizer: Meharit Tekeste, mtekeste@iastate.edu
Session Moderator: Meharit Tekeste, mtekeste@iastate.edu

Sponsoring Committee: MS-45 Soil-Plant-Machine Dynamics
Co-Sponsoring Committee(s): MS-49 Crop Production Systems, Machinery, and Logistics, MS-54 Precision Agriculture

Title of Session: Specialty Crop Engineering POSTER SESSION
Type of Session: Poster
Description of Session: not available
Session Organizer: Yiannis Ampatzidis, i.ampatzidis@ufl.edu
Session Moderator: Long He, luh378@psu.edu
Sponsoring Committee: MS-48 Specialty Crop Engineering
Co-Sponsoring Committee(s): MS-54 Precision Agriculture, ITSC-318 Mechatronics & Biorobotics

NRES-NATURAL RESOURCES & ENVIRONMENTAL SYSTEMS

Title of Session: "Grand" Challenges Session"- Pesticides in Freshwater Systems: Effects and Mitigation"
Type of Session: Hybrid
Description of Session: Agrichemical products such as pesticides are a central component for modern agriculture and food security of the nations. However, in certain settings they have been found to be an important threat to freshwater ecological quality. Sustainable agrichemical use represents one of Society's "Grand Challenges" today. While analysis of pesticide exposure and effect has been dominated by the Ecotoxicology discipline, agricultural and biological engineers must join forces with ecotoxicologists to apply engineering systems-analysis and integration approaches to unravel the mechanistic understanding of pesticides and other agrochemicals in the environment, and identify effective mitigation strategies. This hybrid session (invited-contributed presentations) will convene ecotoxicology and engineering experts presenting recent laboratory, field, and modeling studies that provide new insights on the behavior and mitigation of pesticides in the "real world" environment. The invited presentations will consist of recent work on the assessment of ecological effects and importance of pesticides at the continental scale, new modeling approaches for the mitigation of pesticides with vegetation buffers in regulatory high tier long-term exposure assessments, mechanistic unravelling of ecological effects of pesticides in freshwaters, and novel laboratory and field studies of pesticides fate and effect. We expect that this session will uncover new opportunities for ASABE-NRES community and promote and invigorate future ASABE collaborations with ecotoxicologists and other scientists. The session will include invited keynote and selected contributed presentations, posters, a wrap-up panel discussion to engage and promote membership and retention of current and new ASABE members. A summary and recommendations will be written as a position white paper for one of the ASABE journals following the ASABE AIM meeting.
Session Organizer: Rafael Muñoz-Carpena, carpena@ufl.edu
Session Moderator: Rafael Muñoz-Carpena, carpena@ufl.edu
Sponsoring Committee: NRES-21 Hydrology Group
Co-Sponsoring Committee(s): NRES-253 Riparian Zones, Floodplains, & Wetlands

Title of Session: Advances in Aquacultural Engineering
Type of Session: Hybrid
Description of Session: Invited session: first half (3-4 talks) on theoretical/practical areas in aquacultural engineering; second half on key cutting edge applications. Would hope to have 3-4 top invited people and then "regular" talks from key current work. Co-moderators: Steve Hall (NCSU), Dave Blersch (Auburn)
Session Organizer: Steven Hall, shall5@ncsu.edu
Session Moderator: Steven Hall, shall5@ncsu.edu
Sponsoring Committee: NRES-28 Ecological Engineering
Co-Sponsoring Committee(s): NRES-262 Onsite Water Reuse, ASE-16 Engineering for Sustainability

Title of Session: Advances in Drainage Design, Monitoring, and Modeling (Drainage General)

Type of Session: Oral
Description of Session: With the increased importance of soil drainage in agricultural landscapes, there is growing interest in design, monitoring and modeling of drainage systems in agricultural (and in some cases non-agricultural) landscapes. The field of drainage research is constantly evolving with several major advances in recent years. This session invites presentation topics that advance the science of drainage research and enhance our understanding of the topic in general. Authors are encouraged to submit presentations based on (but not limited to) the following topics: • modeling of surface and/or subsurface drainage systems • innovative approaches to simulate the underlying physical, chemical, or biological processes in agricultural drainage systems (e.g. hydraulics, hydrology, water quality, crop response, soil salinity) • improvements or enhancements of existing models for better representation of drainage processes • case studies showing unique application of drainage modeling, drainage design, and drainage monitoring • model applications in watersheds/regions dominated by surface/subsurface drainage
Session Organizer: Xinhua Jia, xinhua.jia@ndsu.edu
Session Moderator: Vinayak Shedekar, shedekar.1@osu.edu
Sponsoring Committee: NRES-23 Drainage Group
Co-Sponsoring Committee(s): NONE

Title of Session: Advances in Ecological Engineering Research with AEES
Type of Session: Hybrid
Description of Session: not available
Session Organizer: Trisha Moore, tlcmoore@k-state.edu
Session Moderator: Trisha Moore, tlcmoore@k-state.edu
Sponsoring Committee: NRES-28 Ecological Engineering
Co-Sponsoring Committee(s): NONE

Title of Session: Advances in Ecosystem Evapotranspiration Research
Type of Session: Hybrid
Description of Session: Evapotranspiration (ET) processes have important controls and feedbacks for the regional and global climate systems through complex interactions among the Earth's atmospheric, hydrological, and biogeochemical cycles. Innovative methods, tools, and technologies for improved understanding and quantifying of ET are critical for adapting more effective management strategies to cope with the increasing demand for freshwater resources under global change. Papers highlighting advances in potential application of eddy covariance measurements for assessing global water and CO2 fluxes, scintillometry, remote sensing-based applications from landscape to global scale, new numerical to artificial neural network modeling of ET, and innovative methods of experimental field monitoring and mathematical/statistical modeling for estimation of ecosystem ET, and deriving its parameters including crop coefficients for various vegetation types.
Session Organizer: Devendra and Suat Amatya and Irmak, respectively, damatya@fs.fed.us; suat.irmak@unl.edu
Session Moderator: Devendra Amatya, damatya@fs.fed.usSuatIrmak suat.irmak@unl.edu
Sponsoring Committee: NRES-23 Drainage Group
Co-Sponsoring Committee(s): NRES-25 Streams, Reservoirs, and Wetlands Group

Title of Session: Advances in Irrigation Management
Type of Session: Oral
Description of Session: not available
Session Organizer: Isaya Kisekka, ikisekka@ucdavis.edu
Session Moderator: Vivek Sharma, vsharma@uwyo.edu
Sponsoring Committee: NRES-24 Irrigation Group
Co-Sponsoring Committee(s): NRES-244 Irrigation Management

Title of Session: Advances in Mechanistic Understanding and Prediction of Preferential Flow in Soils
Type of Session: Oral
Description of Session: The existence of preferential flow is soils as been widely recognized. When present, pollutants can quickly bypass the soil vadose zone and reach vulnerable aquifers, or when promoting lateral subsurface flow can also affect adjacent surface freshwater bodies. In spite of its wide recognition, the prediction of PF remains pervasive as the quantification of the presence and characteristics of macropores are elusive. This limits the mechanistic analysis and prediction of their potential effects on water quality management. This session aims to convene recent work to advance the mechanistic analysis of PF effects on infiltration and chemical transport across multiple scales (pore, pedon, landscape). Theory-driven experimental and modeling studies will be given preference for oral presentations.
Session Organizer: Devendra Amatya, damatya@fs.fed.us
Session Moderator: Rafael Muñoz-Carpena, carpena@ufl.edu
Sponsoring Committee: NRES-21 Hydrology Group
Co-Sponsoring Committee(s): NRES-23 Drainage Group, NRES-253 Riparian Zones, Floodplains, & Wetlands, NRES-265 Soil and Groundwater Remediation

Title of Session: Anaerobic Digestion
Type of Session: Oral
Description of Session: Anaerobic digestion continues to be a topic of interest for manure treatment and renewable energy production. US RIN credits have made AD to pipeline gas an economically viable option and as a result new AD opportunities are developing.
Session Organizer: Daniel Andersen, dsa@iastate.edu
Session Moderator: Doug Hamilton, dhamilt@okstate.edu
Sponsoring Committee: NRES-27 Ag Byproducts & Animal Mortality Systems
Co-Sponsoring Committee(s): PRS-707 Food & Organic Waste Management & Utilization

Title of Session: Applications of Remote Sensing and UAVs in Irrigation Management
Type of Session: Oral
Description of Session: not available
Session Organizer: Isaya Kisekka, ikisekka@ucdavis.edu
Session Moderator: Charles Hillyer, charles.c.hillyer@gmail.com
Sponsoring Committee: NRES-24 Irrigation Group
Co-Sponsoring Committee(s): NRES-241 Sprinkler Irrigation, NRES-244 Irrigation Management

Title of Session: Benefits and Challenges of Microirrigation
Type of Session: Oral
Description of Session: not available
Session Organizer: Isaya Kisekka, ikisekka@ucdavis.edu
Session Moderator: Freddie Lamm, flamm@ksu.edu
Sponsoring Committee: NRES-24 Irrigation Group
Co-Sponsoring Committee(s): NRES-245 Microirrigation

Title of Session: BMPs and Water Quality: Conservation Systems
Type of Session: Oral
Description of Session: This session invites presentations on all areas of assessing BMPs or conservation systems impacts on flows and water quality including sediment, nutrient, pesticides, pathogens, and other contaminants. Presentations can be related to monitoring, modeling, or combined efforts at field or watershed scale. We hope that this

session can provide learning opportunities to other ASABE-NRES community and presentations from this session may result into collection of papers for the ASABE publications.
Session Organizer: Sanjay Shukla, sshukla@ufl.edu
Session Moderator: Prem Parajuli, pparajuli@abe.msstate.edu
Sponsoring Committee: NRES-22 Erosion Control Group
Co-Sponsoring Committee(s): NRES-21 Hydrology Group, NRES-225 Conservation Systems, NRES-23 Drainage Group, NRES-25 Streams, Reservoirs, and Wetlands Group, NRES-26 Sustainable Land Resources, NRES-28 Ecological Engineering

Title of Session: Challenges and Solutions to Declining Water Supplies for Surface Irrigation
Type of Session: Oral
Description of Session: not available
Session Organizer: Isaya Kisekka, ikisekka@ucdavis.edu
Session Moderator: Michele Reba, michele.reba@ars.usda.gov
Sponsoring Committee: NRES-24 Irrigation Group
Co-Sponsoring Committee(s): NRES-242 Surface Irrigation & Water Supply

Title of Session: Climate Change Impacts on Erosion and Pollutant Transport
Type of Session: Oral
Description of Session: This session will be interested in synthesizing knowledge of changes in erosion types and rates induced by climate change and the resulting impact on pollutant transport
Session Organizer: Sanjay Shukla, sshukla@ufl.edu
Session Moderator: Debu Misra, dmisra@alaska.edu
Sponsoring Committee: NRES-22 Erosion Control Group
Co-Sponsoring Committee(s): NRES-21 Hydrology Group, NRES-223 Erosion Control Research, NRES-25 Streams, Reservoirs, and Wetlands Group, NRES-26 Sustainable Land Resources, NRES-28 Ecological Engineering

Title of Session: CN Hydrology and Alternative Approaches for Runoff Volume or Runoff Rate
Type of Session: Oral
Description of Session: not available
Session Organizer: Devendra Amatya, damatya@fs.fed.us
Session Moderator: Ernest Tollner, btollner@engr.uga.edu
Sponsoring Committee: NRES-21 Hydrology Group
Co-Sponsoring Committee(s): NRES-25 Streams, Reservoirs, and Wetlands Group; ASCE- EWRI

Title of Session: Dams: Issues and Concerns
Type of Session: Hybrid
Description of Session: Dams are a critical piece of the water supply infrastructure to rural and urban water users. However, many of these systems are approaching their design life and/or have been implicated in broader concerns associated with water-based ecosystem services. Therefore, this is an important and pressing topic for hydraulic engineers within the ASABE community to discuss.
Session Organizer: Alica Ketchum, alica.ketchem@va.usda.gov
Session Moderator: Alica Ketchum, alica.ketchem@va.usda.gov
Sponsoring Committee: NRES-25 Streams, Reservoirs, and Wetlands Group,
Co-Sponsoring Committee(s): NRES-251 Hydraulic Strucutres

Title of Session: Drainage POSTER SESSION
Type of Session: Poster
Description of Session: not available
Session Organizer: n/a
Session Moderator: n/a
Sponsoring Committee:
Co-Sponsoring Committee(s):

Title of Session: Dynamics of Phosphorus Movement in Drained Landscapes
Type of Session: Oral
Description of Session: This includes P loss in surface runoff and subsurface drainage from no-till and reduced tillage farms. P loss in drainage water from fields with cover crops.
Session Organizer: Xinhua Jia, xinhua.jia@ndsu.edu
Session Moderator: Ehsan Ghane, ghane@msu.edu
Sponsoring Committee: NRES-23 Drainage Group
Co-Sponsoring Committee(s): NONE

Title of Session: Ecological Engineering Education: Problems and Projects
Type of Session: Oral
Description of Session: not available
Session Organizer: Alex McLemore, amclemore@abac.edu
Session Moderator: Alex McLemore, amclemore@abac.edu
Sponsoring Committee: NRES-28 Ecological Engineering
Co-Sponsoring Committee(s): NONE

Title of Session: Ecological Engineering POSTER SESSION
Type of Session: Poster
Description of Session: not available
Session Organizer: n/a
Session Moderator: n/a
Sponsoring Committee:
Co-Sponsoring Committee(s):

Title of Session: Edge of Field Practices for Nutrient Loss Reduction in Drained Landscapes
Type of Session: Oral
Description of Session: Edge of field practices are becoming increasing looked upon to reduce downstream nutrient loss in drained landscapes through the US and internationally. This session will present up to date research on performance and design of these systems.
Session Organizer: Xinhua Jia, xinhua.jia@ndsu.edu
Session Moderator: Matthew Helmers, mhelmers@iastate.edu
Sponsoring Committee: NRES-23 Drainage Group
Co-Sponsoring Committee(s): NONE

Title of Session: Environmental and Applied Tracers in Groundwater and Surface Water Systems
Type of Session: Hybrid

Description of Session: Environmental and applied (injected) tracers are commonly used to identify water sources, determine water and chemical transport pathways, and observe transformation and fate of contaminants in hydrologic systems. This session invites contributions that utilize isotopes and other tracers (including use of heat as a tracer and other emerging methods) to monitor, model, or increase process understanding of the movement of water, solutes, and sediments in hydrologic systems. We especially invite studies that seek to integrate tracers with groundwater and/or surface water models, or to use tracer data to bolster statistical analyses of water quality monitoring data.
Session Organizer: Troy Gilmore, gilmore@unl.edu
Session Moderator: Troy Gilmore, gilmore@unl.edu
Sponsoring Committee: NRES-21 Hydrology Group
Co-Sponsoring Committee(s): NRES-01 POSTER SESSION, NRES-224 Sediment and Associated Pollutants, NRES-25 Streams, Reservoirs, and Wetlands Group, NRES-252 Geomrphlgy, Streambk Stblty & In-Stream Processes, NRES-253 Riparian Zones, Floodplains, & Wetlands, NRES-28 Ecological Engineering

Title of Session: Erosion Control POSTER SESSION
Type of Session: Poster
Description of Session: not available
Session Organizer: n/a
Session Moderator: n/a
Sponsoring Committee:
Co-Sponsoring Committee(s):

Title of Session: Erosion Control Research
Type of Session: Oral
Description of Session: This session invites presentations on soil erosion research, including soil erosion by water or wind mechanics, soil erosion prediction technologies and model development, and soil erosion control methods. Erosion control research may be related to agricultural, forested, urban, or other areas where soil detachment by water or wind is prevalent and causing on-site and/or off-site problems.
Session Organizer: Sanjay Shukla, sshukla@ufl.edu
Session Moderator: Dennis Flanagan, flanagan@purdue.edu
Sponsoring Committee: NRES-22 Erosion Control Group
Co-Sponsoring Committee(s): NRES-223 Erosion Control Research

Title of Session: Flood vs Drought: Water Availability and Watershed Management
Type of Session: Hybrid
Description of Session: not available
Session Organizer: Sherry Hunt, sherry.hunt@ars.usda.gov
Session Moderator: Sherry Hunt, sherry.hunt@ars.usda.gov
Sponsoring Committee: NRES-25 Streams, Reservoirs, and Wetlands Group,
Co-Sponsoring Committee(s): NRES-251 Hydraulic Strucutres, NRES-21 Hydrology Group, NRES-24 Irrigation Group, NRES-28 Ecological Engineering

Title of Session: Hydrologic and Climate Data: Challenges and Opportunities
Type of Session: Oral
Description of Session: Long-term continuous daily or sub daily data are needed for successful crop and hydrologic modeling analysis. Any issues like paucity of data, missing values and bias associated with the simulated data can lead to misleading results. There is dire need to identify and resolve these issue for improved modeling studies. Submissions will

be accepted on challenges and opportunities related to limited data availability, missing data, uncertainty, and big data handling in hydrological sciences.
Session Organizer: Devendra Amatya, damatya@fs.fed.us
Session Moderator: Sushant Mehan, sushantmehan@gmail.com
Sponsoring Committee: NRES-21 Hydrology Group
Co-Sponsoring Committee(s): NRES-21 Hydrology Group, NRES-28 Ecological Engineering

Title of Session: Hydrology POSTER SESSION
Type of Session: Poster
Description of Session: not available
Session Organizer: n/a
Session Moderator: n/a
Sponsoring Committee:
Co-Sponsoring Committee(s):

Title of Session: Innovative Water Quality and Hydrologic Monitoring and Analysis
Type of Session: Oral
Description of Session: The processes governing water quality in aquatic ecosystems are complex and even more so when coupled with hydrology. Advancements in hydrologic and water quality measurements, analysis, and data-driven modeling have created ways to further understand and utilize hydrologic and water quality information, though numerous challenges still exist. ASABE is at the forefront of hydrologic and water quality innovation. This session will have presenters from across the world sharing their work on innovative monitoring and analysis methods. For approximately 8 years, this session has been included in AIM.
Session Organizer: Devendra Amatya, damatya@fs.fed.us
Session Moderator: Debabrata Sahoo, Debabrata.Sahoo@woolpert.com
Sponsoring Committee: NRES-21 Hydrology Group
Co-Sponsoring Committee(s): NRES-28 Ecological Engineering

Title of Session: Irrigation Management in Humid and Sub-Humid Regions
Type of Session: Oral
Description of Session: not available
Session Organizer: Isaya Kisekka, ikisekka@ucdavis.edu
Session Moderator: Isaya Kisekka, ikisekka@ucdavis.edu
Sponsoring Committee: NRES-24 Irrigation Group
Co-Sponsoring Committee(s): NRES-241 Sprinkler Irrigation, NRES-244 Irrigation Management

Title of Session: Irrigation POSTER SESSION
Type of Session: Poster
Description of Session: not available
Session Organizer: n/a
Session Moderator: n/a
Sponsoring Committee:
Co-Sponsoring Committee(s):

Title of Session: Low Impact Development and Ecohydrology
Type of Session: Oral

Description of Session: not available
Session Organizer: Tiffany Messer, tiffany.messer@unl.edu
Session Moderator: Fouad Jaber, f-jaber@tamu.edu
Sponsoring Committee: NRES-28 Ecological Engineering
Co-Sponsoring Committee(s): NRES-22 Erosion Control Group

Title of Session: Managing Manure and Agricultural Byproducts for Sustainability
Type of Session: Oral
Description of Session: Animal production is important for value adding to agriculture. If not used and recycled become a waste, at the current time we have been writing nutrient management plans since the 1990s, but the new age of precision agriculture, big data, and a renewed emphasis on water quality. This session will look at innovative ways to utilize manure and nutrient management plans for the 21s century. If there is enough interest we would potentially have a part 1 and part 2 for this session (this has been the case for the previous years)..
Session Organizer: Daniel Andersen, dsa@iastate.edu
Session Moderator: Linda Schott, linda.rae.schott@gmail.com
Sponsoring Committee: NRES-27 Ag Byproducts & Animal Mortality Systems
Co-Sponsoring Committee(s): NONE

Title of Session: Manure Treatment Systems
Type of Session: Oral
Description of Session: Manure often has a high water content making transport economically expensive and time consuming. As a result farms often are looking for treatment methods to either concentrate the manure nutrients into higher fertilizer like products, remove nutrients form the manure to reduce constraints on disposal, or remove bacteria and pathogens. This session will provide an opportunity to discuss these technologies.
Session Organizer: Daniel Andersen, dsa@iastate.edu
Session Moderator: Shafiqur Rahman, s.rahman@ndsu.edu
Sponsoring Committee: NRES-27 Ag Byproducts & Animal Mortality Systems
Co-Sponsoring Committee(s): NONE

Title of Session: Measurement and Modeling of Ecosystem Services
Type of Session: Oral
Description of Session: not available
Session Organizer: Tiffany Messer, tiffany.messer@unl.edu
Session Moderator: Sanjay Shukla, sshukla@ifas.ufl.edu
Sponsoring Committee: NRES-28 Ecological Engineering
Co-Sponsoring Committee(s): NRES-21 Hydrology Group, NRES-25 Streams, Reservoirs, and Wetlands Group

Title of Session: Modeling of Water Quality and Hydrology
Type of Session: Oral
Description of Session: Hydrologic and water quality modeling plays a significant role in the profession of many agricultural and biological engineers, and it is often used to inform important management and regulatory decisions. This session invites presentations related to all areas of hydrology and/or water quality modeling, including but not limited to: field-scale modeling, watershed-scale modeling, and receiving water modeling. The session offers an opportunity for modelers to share innovations in model code enhancements, model input development techniques, parameterization and calibration strategies, uncertainty and sensitivity analyses, and/or unique model applications.
Session Organizer: Devendra Amatya, damatya@fs.fed.us
Session Moderator: Derek Schlea, dschlea@limno.com

Sponsoring Committee: NRES-21 Hydrology Group
Co-Sponsoring Committee(s): NONE

Title of Session: Nutrient Removal, Recovery and Recycle
Type of Session: Oral
Description of Session: not available
Session Organizer: Tiffany Messer, tiffany.messer@unl.edu
Session Moderator: Lordwin Jeyakumar, lordwingirish@gmail.com
Sponsoring Committee: NRES-28 Ecological Engineering
Co-Sponsoring Committee(s): NONE

Title of Session: Nutrient Transport and Cycling: Measurements and Modeling
Type of Session: Oral
Description of Session: This session solicits presentations on all aspects of nutrient cycling and transport at field and watershed scales in agricultural and urban systems. It will include papers on both measurements and modeling aspects. The focus will be on nitrogen and phosphorus but other nutrients as they affect the agricultural productivity and water quality will also be considered. This session has been offered at AIM for 20 years.
Session Organizer: Sanjay Shukla, sshukla@ufl.edu
Session Moderator: Sanjay Shukla, sshukla@ufl.edu
Sponsoring Committee: NRES-22 Erosion Control Group
Co-Sponsoring Committee(s): NRES-224 Sediment and Associated Pollutants, NRES-23 Drainage Group, NRES-25 Streams, Reservoirs, and Wetlands Group, NRES-26 Sustainable Land Resources, NRES-28 Ecological Engineering

Title of Session: Precision Irrigation
Type of Session: Oral
Description of Session: Without irrigation, highly productive agriculture and food production would not be possible in many parts of the world. However, population growth, environmental needs, along with a changing climate are putting pressure on agriculture to optimize water use. A new approach to irrigation management know as precision irrigation may provide solutions to optimizing use of limited water in agriculture. Precision irrigation is an integrated approach to water management that includes precise irrigation application of water over time and space (e.g., variable rate microirrigation and sprinkler irrigation systems), integrated soil and plant water status sensing systems, simulation models and intelligent decision support systems for various crops.
Session Organizer: Isaya Kisekka, ikisekka@ucdavis.edu
Session Moderator: Isaya Kisekka, ikisekka@ucdavis.edu
Sponsoring Committee: NRES-24 Irrigation Group
Co-Sponsoring Committee(s): MS-54 Precision Agriculture

Title of Session: Real-Time Systems to Manage Natural Resources and Environmental Systems
Type of Session: Oral
Description of Session: Electronic sensors have become an integral part of natural systems as technology has advanced. Sensors and equipment, along with technologies such as the Internet of Things (IoT), Machine Learning (ML), Artificial Intelligence (AI), and Data Analytics, are starting to be used intelligently to further understand responses of natural systems and allow appropriate reactions and responses to occur. Communication systems deployed in natural and environmental systems allow for a more complete understanding of the system and for actions to be taken to improve the system. Real-time applications assist in informing citizens and stakeholders of what is occurring in natural systems and allow for more efficient reactions. Real-time data collection in natural systems can utilize weather forecast information, process the data received, and implement smart natural resource management strategies to achieve

maximum benefits. ASABE should take the lead in real-time system engineering. This session will be offered for the first time in AIM, within the NRES community.
Session Organizer: Devendra Amatya, damatya@fs.fed.us
Session Moderator: Debabrata Sahoo, Debabrata.Sahoo@woolpert.com
Sponsoring Committee: NRES-21 Hydrology Group
Co-Sponsoring Committee(s): NRES-28 Ecological Engineering, ITSC-353 Instrumentation & Controls

Title of Session: Site Specific and Variable Rate Irrigation
Type of Session: Oral
Description of Session: This is an emerging topic in irrigation
Session Organizer: Isaya Kisekka, ikisekka@ucdavis.edu
Session Moderator: Ken Stone, ken.stone@ars.usda.govBurdetteBarker burdette.barker@huskers.unl.edu
Sponsoring Committee: NRES-24 Irrigation Group
Co-Sponsoring Committee(s): NRES-241 Sprinkler Irrigation

Title of Session: Stream Restoration
Type of Session: Hybrid
Description of Session: not available
Session Organizer: Phuc Vu, phuc.vu@ftw.usda.gov
Session Moderator: Phuc Vu, phuc.vu@ftw.usda.gov
Sponsoring Committee: NRES-25 Streams, Reservoirs, and Wetlands Group,
Co-Sponsoring Committee(s): NRES-252 Geomorphology, Streambank Stability and In-Stream Processess; NRES-28 Ecological Engineering

Title of Session: Stream, Reservoir and Wetland Case Studies
Type of Session: Hybrid
Description of Session: A need for case examples in which stream, wetland and/or reservoir restoration or management are exemplified was identified to help improve future efforts to implement similar restoration/management strategies (in which ASABE members are involved) of these water resources.
Session Organizer: Carolyln Jones, Carolyn.Jones@ca.usda.gov
Session Moderator: Carolyln Jones, Carolyn.Jones@ca.usda.gov
Sponsoring Committee: NRES-25 Streams, Reservoirs, and Wetlands Group,
Co-Sponsoring Committee(s): NRES- 25 Riparian Zones, Floodplains, and Wetlands; NRES-28 Ecological Engineering

Title of Session: Streams, Reservoirs and Wetlands POSTER SESSION
Type of Session: Poster
Description of Session: not available
Session Organizer: n/a
Session Moderator: n/a
Sponsoring Committee:
Co-Sponsoring Committee(s):

Title of Session: Sustainability Metrics – Concept, Evaluation, and Advances
Type of Session: Oral
Description of Session: Global food demand is projected to be doubled in the next 50 years, which poses huge challenges for the sustainability of food production and terrestrial and aquatic ecosystems as well as the services they

provide. New incentives and policies for ensuring the sustainability of agriculture and ecosystem services will be crucial if we are to meet the demands of improving yields without compromising environmental integrity or public health. Agricultural and biological engineers need to work together to design innovative ways to evaluate the sustainability of agricultural landuse, practices and production; as well as the sustainability of food, water and energy as a system.
Session Organizer: Ruth Book, Ruth.Book@il.usda.gov
Session Moderator: Yongping Yuan, Yuan.Yongping@epa.gov
Sponsoring Committee: NRES-26 Sustainable Land Resources
Co-Sponsoring Committee(s): ASE-16 Engineering for Sustainability

Title of Session: Sustainable Land Resources POSTER SESSION
Type of Session: Poster
Description of Session: not available
Session Organizer: n/a
Session Moderator: n/a
Sponsoring Committee:
Co-Sponsoring Committee(s):

Title of Session: Waterborne Pathogens and Emerging Contaminants
Type of Session: Oral
Description of Session: not available
Session Organizer: Tiffany Messer, tiffany.messer@unl.edu
Session Moderator: David Blersch, dmb0040@auburn.edu
Sponsoring Committee: NRES-28 Ecological Engineering
Co-Sponsoring Committee(s): NRES-21 Hydrology Group, NRES-22 Erosion Control Group, NRES-224 Sediment and Associated Pollutants

PAFS-PLANT, ANIMAL, AND FACILITY SYSTEMS

Title of Session: Agri-Industrial Facility Design and Operation
Type of Session: Oral
Description of Session: Fundamental for process development and is an ongoing research field.
Session Organizer: Keaton Friesen, kfriesen@mfsyork.com
Session Moderator: Keaton Friesen, kfriesen@mfsyork.com
Sponsoring Committee: PAFS-20 Structures Group
Co-Sponsoring Committee(s): PAFS-07/1 Agri-Industrial Facility Design and Operation, PAFS-20/4 Bulk Solids Handling and Storage, PRS-701 Physical Properties of Ag & Biological Products, PRS-702 Crop & Feed Processing & Storage, PRS-703 Food Processing

Title of Session: Agri-Industrial Facility Design and Operation POSTER SESSION
Type of Session: Poster
Description of Session: not available
Session Organizer: n/a
Session Moderator: n/a
Sponsoring Committee:
Co-Sponsoring Committee(s):

Title of Session: Air Emission from Livestock and Poultry Production
Type of Session: Oral
Description of Session: Air emissions from livestock and poultry production affect the economic, social and environmental aspects of producing protein.
Session Organizer: Lingjuan Wang-Li, lwang5@ncsu.edu
Session Moderator: Lingjuan Wang-Li, lwang5@ncsu.edu
Sponsoring Committee: PAFS-50 Environmental Air Quality
Co-Sponsoring Committee(s): NONE

Title of Session: Animal Environment POSTER SESSION
Type of Session: Poster
Description of Session: not available
Session Organizer: n/a
Session Moderator: n/a
Sponsoring Committee:
Co-Sponsoring Committee(s):

Title of Session: Animal Production Facilities POSTER SESSION
Type of Session: Poster
Description of Session: not available
Session Organizer: n/a
Session Moderator: n/a
Sponsoring Committee:
Co-Sponsoring Committee(s):

Title of Session: Aquaculture Facilities POSTER SESSION
Type of Session: Poster
Description of Session: not available
Session Organizer: n/a
Session Moderator: n/a
Sponsoring Committee:
Co-Sponsoring Committee(s):

Title of Session: Biosecurity for Livestock and Poultry Production Systems
Type of Session: Oral
Description of Session: Engineers play a critical role in technologies, designs and practices that contribute to biosecurity in and around livestock facilities.
Session Organizer: Erin Cortus, ecortus@umn.edu
Session Moderator: Purswell Joseph, joseph.purswell@ars.usda.gov
Sponsoring Committee: PAFS-40 Facilities & Systems Group
Co-Sponsoring Committee(s): PAFS-50 Environmental Air Quality, PAFS-07/1 Agri-Industrial Facility Design and Operation, PAFS-40 Facilities & Systems Group, NRES-27 Ag Byproducts & Animal Mortality Systems

Title of Session: Bulk Solids Handling and Storage POSTER SESSION
Type of Session: Poster
Description of Session: not available

Session Organizer: n/a
Session Moderator: n/a
Sponsoring Committee:
Co-Sponsoring Committee(s):

Title of Session: Bulk Solids Storage, Bulk Materials Properties
Type of Session: Oral
Description of Session: not available
Session Organizer: Keaton Friesen, kfriesen@mfsyork.com
Session Moderator: Greg Williams, gdwilliams3@cox.net
Sponsoring Committee: PAFS-20 Structures Group
Co-Sponsoring Committee(s): NONE

Title of Session: Design, Analysis, Testing and Assembly of Structure
Type of Session: Oral
Description of Session: Fundamental for process development and is an ongoing research field.
Session Organizer: Keaton Friesen, kfriesen@mfsyork.com
Session Moderator: Keaton Friesen, kfriesen@mfsyork.com
Sponsoring Committee: PAFS-20 Structures Group
Co-Sponsoring Committee(s): PAFS-20/4 Bulk Solids Handling and Storage, PAFS-40 Facilities & Systems Group, PRS-701 Physical Properties of Ag & Biological Products

Title of Session: Emerging Information Systems for Animal Production Systems
Type of Session: Oral
Description of Session: The personal technology movement has resulted in a rapid diffusion of innovation in agriculture ranging from the Internet of Pigs to flying robots for herding cattle, yet these new approaches are among the least well studied in the integrative context of emerging information systems. This session will provide an interdisciplinary forum with a primary goal to discuss the current state-of-the-art, and the needed advances, focused specifically on the integration of these types of individual technologies for animal production. The session is expected to address a diverse range of topics including, but not limited to: visual sensing and sensemaking, novel animal and environmental manipulation with robots, software interfaces for human-livestock interaction, privacy and security of animal health data, understanding of livestock sociotechnical proxemics, and livestock sound and gesture characterization. A broad range of participants representing the academic, governmental, and industrial sectors are encouraged to apply and will bring a richer and more complete understanding in this emerging field. This session is jointly sponsored with ITSC 254: Emerging Information Systems.
Session Organizer: Joshua Peschel, peschel@iastate.edu
Session Moderator: Joshua Peschel, peschel@iastate.edu
Sponsoring Committee: PAFS-40 Facilities & Systems Group
Co-Sponsoring Committee(s): ITSC-254 Emerging Information Systems

Title of Session: Envrionmental Air Quality POSTER SESSION
Type of Session: Poster
Description of Session: not available
Session Organizer: n/a
Session Moderator: n/a
Sponsoring Committee:
Co-Sponsoring Committee(s):

Title of Session: Greenhouse and Nursery Technology
Type of Session: Oral
Description of Session: This session will present new innovations and designs used in greenhouses. It will regroup both robotics (monitoring) and biological aspects (plant growth). Topics including AI for yield prediction, substrate, nutrient measurement, plant 3D modelling and light measurements are accepted.
Session Organizer: Mark Lefsrud, mark.lefsrud@mcgill.ca
Session Moderator: Bo-Sen Wu, bo-sen.wu@mail.mcgill.ca
Sponsoring Committee: PAFS-30 Plant Systems Group
Co-Sponsoring Committee(s): NONE

Title of Session: Greenhouse and Plant Production Facilities POSTER SESSION
Type of Session: Poster
Description of Session: not available
Session Organizer: n/a
Session Moderator: n/a
Sponsoring Committee:
Co-Sponsoring Committee(s):

Title of Session: Indoor Plants Environments; Energy and Automation
Type of Session: Oral
Description of Session: This session will present new designs for controlled environments with a focus on energy consumption and automation (robotics). This session will cover irrigation, how to minimize the ecological footprint during plant production, different heating systems and energy storage.
Session Organizer: Mark Lefsrud, mark.lefsrud@mail.mcgill.ca
Session Moderator: Peter Tikasz, peter.tikasz@mail.mcgill.ca
Sponsoring Committee: PAFS-30 Plant Systems Group
Co-Sponsoring Committee(s): NONE

Title of Session: Indoor Production of Cannabis and Other Medicinal Plants
Type of Session: Oral
Description of Session: This session will be on cannabis production within controlled environment or greenhouses. This session includes growing policies, medical and recreational production (in allowed countries). Growing and monitoring technologies will be presented. THC extraction presentations are also accepted.
Session Organizer: Mark Lefsrud, mark.lefsrud@mcgill.ca
Session Moderator: Nadia Sabeh, nadia@doctorgreenhouse.com
Sponsoring Committee: PAFS-30 Plant Systems Group
Co-Sponsoring Committee(s): NONE

Title of Session: Measurement, Mitigation and Modeling of Air Pollution from Livestock and Poultry Facilities
Type of Session: Oral
Description of Session: Understanding the quantity and quality of air emissions from livestock and poultry operations, as well as ways to mitigate pollution, are important for regulatory, conservation, and public health decisions.
Session Organizer: Jactone Ogejo, arogo@vt.edu
Session Moderator: Jactone Ogejo, arogo@vt.edu
Sponsoring Committee: PAFS-50 Environmental Air Quality

Co-Sponsoring Committee(s): NONE

Title of Session: New and Recommended Changes in Building Codes and Standards
Type of Session: Oral
Description of Session: not available
Session Organizer: Keaton Friesen, kfriesen@mfsyork.com
Session Moderator: Greg Williams, gdwilliams3@cox.net
Sponsoring Committee: PAFS-20 Structures Group
Co-Sponsoring Committee(s): NONE

Title of Session: Precision Animal Management and Environmental Control
Type of Session: Oral
Description of Session: This session focuses on precision animal farming that addresses multidimensional challenges in livestock and poultry production regarding animal environment, management, welfare, and behavior.
Session Organizer: Yang Zhao, yzhao@abe.msstate.edu
Session Moderator: Yang Zhao, yzhao@abe.msstate.edu
Sponsoring Committee: PAFS-40 Facilities & Systems Group
Co-Sponsoring Committee(s): ITSC-312 Machine Vision

Title of Session: Precision Livestock Farming POSTER SESSION
Type of Session: Poster
Description of Session: not available
Session Organizer: n/a
Session Moderator: n/a
Sponsoring Committee:
Co-Sponsoring Committee(s):

Title of Session: Structural Design of Agrilcultural Facilities POSTER SESSION
Type of Session: Poster
Description of Session: not available
Session Organizer: n/a
Session Moderator: n/a
Sponsoring Committee:
Co-Sponsoring Committee(s):

Title of Session: Sustainable Building Technology
Type of Session: Oral
Description of Session: not available
Session Organizer: Keaton Friesen, kfriesen@mfsyork.com
Session Moderator: Greg Williams, gdwilliams3@cox.net
Sponsoring Committee: PAFS-20 Structures Group
Co-Sponsoring Committee(s): NONE

PRS-PROCESSING SYSTEMS

Title of Session: Artificial Intelligence and Data Science (Big Data) in Processing
Type of Session: Hybrid
Description of Session: The field of Artificial Intelligence, Deep learning and Big Data Science are growing rapidly with implications in all the aspects of life. Thi session will provide the forum for advancements in big data and artificial intelligence for food and bioprocessing
Session Organizer: Griffiths Atungulu, Atungulu@uark.edu
Session Moderator: Griffiths Atungulu, Atungulu@uark.edu
Sponsoring Committee: PRS-703 Food Processing
Co-Sponsoring Committee(s): MS-23/7/2 Forage & Biomass Engineering, PRS-280 Bioconversion and Bioprocesses, PRS-701 Physical Properties of Ag & Biological Products, PRS-702 Crop & Feed Processing & Storage, ASE-16 Engineering for Sustainability, ITSC-230 Biosensors, ITSC-254 Emerging Information Systems, ITSC-312 Machine Vision, ITSC-318 Mechatronics & Biorobotics, ITSC-348 Electromagnetics & Spectroscopy

Title of Session: Biochemical Conversion Processes
Type of Session: Oral
Description of Session: Biochemical conversion processes include the use of live organisms and enzymes for the generation of bioproducts of commercial significance for a variety of industries, and the transformation of biomass for the enhancement of the circular bioeconomy.
Session Organizer: Juliana Vasco-Correa, vascocorrea.1@osu.edu
Session Moderator: Catherine Brewer, cbrewer@nmsu.edu
Sponsoring Committee: PRS-280 Bioconversion and Bioprocesses
Co-Sponsoring Committee(s): ES-220 Biomass Energy & Industrial Byproducts

Title of Session: Bioprocess Engineering POSTER SESSION
Type of Session: Poster
Description of Session: not available
Session Organizer: n/a
Session Moderator: n/a
Sponsoring Committee: PRS
Co-Sponsoring Committee(s): NONE

Title of Session: Bioprocess Modeling, Sustainability and Technoeconomic Analysis
Type of Session: Oral
Description of Session: Bioprocess modeling include a variety of techniques of modeling and simulation, such as kinetic modeling, CFD, LCA, and TEA, that allow the evaluation, scale-up, and prediction of the feasibility of new and existing biochemical processes.
Session Organizer: Juliana Vasco-Correa, vascocorrea.1@osu.edu
Session Moderator: Samy Sakada, ssadaka@uaex.edu
Sponsoring Committee: PRS-280 Bioconversion and Bioprocesses
Co-Sponsoring Committee(s): ES-220 Biomass Energy & Industrial Byproducts

Title of Session: Food Process Engineering
Type of Session: Hybrid
Description of Session: This session provides a forum for presenting and discussing the advancements in Food Process Engineering including equipment and process innovations
Session Organizer: Ewunbua Monono, ewumbua.monono@ndsu.edu
Session Moderator: Ewunbua Monono, ewumbua.monono@ndsu.edu
Sponsoring Committee: PRS-703 Food Processing

Co-Sponsoring Committee(s): PRS-701 Physical Properties of Ag & Biological Products

Title of Session: Food Process Engineering and Mathematical Modeling POSTER SESSION
Type of Session: Poster
Description of Session: not available
Session Organizer: n/a
Session Moderator: n/a
Sponsoring Committee: PRS
Co-Sponsoring Committee(s): NONE

Title of Session: Food Safety Engineering
Type of Session: Hybrid
Description of Session: This session provides a forum for presenting and discussing engineering innovations in food safety applications
Session Organizer: Steven Walker, stephen.walker@fda.hhs.gov
Session Moderator: Steven Walker, stephen.walker@fda.hhs.gov
Sponsoring Committee: PRS-703 Food Processing
Co-Sponsoring Committee(s): NONE

Title of Session: Microwave and Radio-Frequency Energy for Processing
Type of Session: Oral
Description of Session: This session provides a forum for presenting and discussing advancements in using Microwave and RadioFrequecy Energy for Food and Agricultural Processing
Session Organizer: Satyanarayan Dev, satyanarayan.dev@gmail.com
Session Moderator: Satyanarayan Dev, satyanarayan.dev@gmail.com
Sponsoring Committee: PRS-703 Food Processing
Co-Sponsoring Committee(s): PRS-703 Food Processing

Title of Session: Modeling and Optimization in Food Processing and Storage
Type of Session: Hybrid
Description of Session: This session provides a forum for presenting and discussing the research related to invited and submitted abstracts in the field of Modeling and Optimization in Food Procesing and Storage
Session Organizer: Satyanarayan Dev, satyanarayan.dev@gmail.com
Session Moderator: Satyanarayan Dev, satyanarayan.dev@gmail.com
Sponsoring Committee: PRS-703 Food Processing
Co-Sponsoring Committee(s): PRS-703 Food Processing

Title of Session: Physical Properties and Spectral Imaging POSTER SESSION
Type of Session: Poster
Description of Session: not available
Session Organizer: n/a
Session Moderator: n/a
Sponsoring Committee: PRS
Co-Sponsoring Committee(s): NONE
Title of Session: Physical Properties Related to Drying and Storage
Type of Session: Oral

Description of Session: Fundamental for process development and storage that is an ongoing research field.
Session Organizer: Igathinathane Cannayen, Igathinathane.Cannayen@ndsu.edu
Session Moderator: Igathinathane Cannayen, Igathinathane.Cannayen@ndsu.edu
Sponsoring Committee: PRS-702 Crop & Feed Processing & Storage
Co-Sponsoring Committee(s): PRS-701 Physical Properties of Ag & Biological Products

Title of Session: Physical Properties Related to Processing and Handling
Type of Session: Oral
Description of Session: Fundamental for process development and is an ongoing research field.
Session Organizer: Igathinathane Cannayen, Igathinathane.Cannayen@ndsu.edu
Session Moderator: Igathinathane Cannayen, Igathinathane.Cannayen@ndsu.edu
Sponsoring Committee: PRS-702 Crop & Feed Processing & Storage
Co-Sponsoring Committee(s): PRS-701 Physical Properties of Ag & Biological Products

Title of Session: Postharvest Storage and Safety POSTER SESSION
Type of Session: Poster
Description of Session: not available
Session Organizer: n/a
Session Moderator: n/a
Sponsoring Committee: PRS
Co-Sponsoring Committee(s): NONE

Title of Session: Spectral Scattering, Fluorescence, and Raman Technology for Food Quality and Safety
Type of Session: Oral
Description of Session: Advanced research area in rapid analysis of food quality and safety.
Session Organizer: Igathinathane Cannayen, Igathinathane.Cannayen@ndsu.edu
Session Moderator: Jianwei Qin, jianwei.qin@ars.usda.gov
Sponsoring Committee: PRS-701 Physical Properties of Ag & Biological Products
Co-Sponsoring Committee(s): PRS-703 Food Processing, ITSC-348 Electromagnetics & Spectroscopy

Title of Session: System Approach to Develop Sustainable Food and Organic Wastes/Byproducts Management Solutions
Type of Session: Oral
Description of Session: not available
Session Organizer: Sarah Wu, xwu@uidaho.edu
Session Moderator: Sarah Wu, xwu@uidaho.edu
Sponsoring Committee: PRS-707 Food & Organic Waste Management & Utilization
Co-Sponsoring Committee(s): NONE