CSABE/ASABE Annual International Meeting
Toronto, July 13-16, 2025
TECHNICAL SESSION SCHEDULE

Listed below are all of the technical sessions and presentations scheduled at 2025 AIM, ordered by day and time.

Poster Sessions = Presenters will be at their printed poster in the common area ready to discuss their work individually or in small groups. A great opportunity to connect with the authors.
Oral Sessions = Standard 12-minute talk time with 2- to 3-minute question and answer period.
Hybrid Sessions = a mix of guest speaker and submitted abstract oral talks.
Lightning Talks = 7-minute lightning oral presentations and Q&A. *Lightning Panel* will have a 7-minute break after every fourth speaker to enable group discussion. *Lightning Session* will be 7-minute lightning oral presentations with Q&A. No scheduled breaks during the session for discussion.

This document will be updated in April to include presentations in each session.
Updated on 4/14/2025.

Monday, July 14 - 9:30am-12:00pm

ASE - Applied Science & Engineering

101 Biomass Preprocessing and Logistics for Biofuels and Bioproducts

Monday, 9:30am-12:00pm
Technical Community: ASE - Applied Science & Engineering
Session Type: Oral Technical Session
Description: Updates and research on use of tools and equipment to scale up and automate components of biomass processing.
Organizer: Ashish Manandhar, manandhar.5@osu.edu
Sponsoring Committee: ASE-12 Forest Engineering; **Co-Sponsors:** MS-23/7/2 Forage & Biomass Engineering, PRS-280 Bioconversion and Bioprocesses
Moderators: David Lanning

CBS - Circular Bioeconomy Systems

102 Advancing Circular Bioeconomy Systems (CBS): Opportunities and Challenges-HYBRID

Monday, 9:30am-12:00pm
Technical Community: CBS - Circular Bioeconomy Systems
Session Type: Hybrid Session-submitted abstracts and guest speakers
Description: This session includes identification/description of opportunities and challenges, as well as progress toward taking advantage of opportunities and advancing solutions to challenges about various aspects of CBS, for example, technical, regulatory, financial, environmental, infrastructure, multi-disciplinary collaboration, and public perception and support.
Organizer: Erin Webb, webbeg@ornl.gov
Sponsoring Committee: CBSI; **Co-Sponsors:** MS-03/2 Farm Materials Handling and Transport, MS-49 Crop Production Systems, Machinery, and Logistics, NRES-26 Sustainable Land Resources, NRES-27 Ag Byproducts & Animal Mortality Systems, PRS-280 Bioconversion and Bioprocesses, PRS-702 Crop & Feed Processing & Storage, ASE-16 Engineering for Sustainability, ES-220 Bio-based Energy, Fuels and Products
Moderators: Erin Webb, John Reid

E-2050 - Global Engagement

103 China Exchange & AOCABFE Business Meeting-PANEL

Monday, 9:30am-12:00pm

Technical Community: E-2050 - Global Engagement

Session Type: Panel Discussion

Description: Association of Overseas Chinese Agricultural, Biological, and Food Engineers is an independent, non-political, non-profit organization for professionals with Chinese origins in agricultural, biological, and food engineering fields worldwide. This session aims to promote information exchange and networking among agricultural, biological, and food engineers of Chinese origin worldwide, facilitate collaboration in research and educational exchange, and encourage professional development among our community.

Organizer: Yeyin Shi, yshi18@unl.edu

Sponsoring Committee: E-2050 Global Engagement; **Co-Sponsors:**

Moderators: Yeyin Shi, Yin Bao

EOPD - Education, Outreach, & Professional Development

104 Engineering Ethics across Cultures-RAP SESSION

Monday, 9:30am-12:00pm

Technical Community: EOPD - Education, Outreach, & Professional Development

Session Type: Rap Session

Description: This RAP session will explore how ethical decision making is impacted by global and cultural differences. Participants will be introduced to an ethical decision-making framework and engage in small-group discussions to apply the framework to example scenarios where these differences could impact engineering ethics.

Organizer: Deepak Keshwani, dkeshwani2@unl.edu

Sponsoring Committee: EOPD-412 Professional Ethics; **Co-Sponsors:** E-2050 Global Engagement, EOPD-203 Undergraduate & Graduate Instruction, E-03 IDEA

Moderators: Deepak Keshwani, Bob Gustafson

ES - Energy Systems

105 Advances in Biomass Preprocessing and Pretreatment

Monday, 9:30am-12:00pm

Technical Community: ES - Energy Systems

Session Type: Oral Technical Session

Description: Mechanical preprocessing. Biomass fractionation. Chemical, biological and thermal pretreatments of biomass to improve physical, chemical, and thermal properties for biochemical and thermochemical conversions.

Organizer: Mi Li, mli47@utk.edu

Sponsoring Committee: ES-220 Bio-based Energy, Fuels and Products; **Co-Sponsors:**

Moderators: Tirath Raj, Nitesh Kasera

106 Current Achievements and New R&D Trends in Renewable Energy Resources and Technologies-GUEST SPEAKERS

Monday, 9:30am-12:00pm

Technical Community: ES - Energy Systems

Session Type: Guest Speaker Session

Description: Join us for innovative talks focused on the integration of renewable energy practices in agriculture, engineering and the natural sciences. Experts will explore cutting-edge technologies and sustainable

practices designed to enhance energy efficiency, energy policy trends and development, environmental stewardship and outreach within the agricultural sector.

Organizer: Jaime Thissen, jaimethissen1@gmail.com
Sponsoring Committee: ES-210 Renewable Power Generation Committee; **Co-Sponsors:**
Moderators: Jaime Thissen

107 ES-Energy Systems POSTER SESSION

Monday, 9:30am-12:00pm
Technical Community: ES - Energy Systems
Session Type: Poster Technical Session
Description: The ES poster system will provide a venue for showcasing the advances in all the processes, technologies, economics, and policies impacting the energy production, distribution, and consumption with a particular focus on renewable energy technologies and agricultural and food processing sectors. Early-stage high impactful research, scale-up, and field deployment studies are encouraged. Students are especially encouraged to present their research in the highly interactive ES poster session.
Organizer: Mi Li, mli47@utk.edu
Sponsoring Committee: ES-220 Bio-based Energy, Fuels and Products; **Co-Sponsors:**
Moderators: Ashish Manandhar, Bernard Baffour Asare Bediako

ITSC - Information Technology, Sensors & Control Systems

108 Advanced Machine Learning-I

Monday, 9:30am-12:00pm
Technical Community: ITSC - Information Technology, Sensors & Control Systems
Session Type: Oral Technical Session
Description: Focuses on advanced machine learning techniques for plant and animal characteristics and behaviors.
Organizer: Joe Dvorak, joe.dvorak@uky.edu
Sponsoring Committee: ITSC-254 Emerging Information Systems; **Co-Sponsors:**
Moderators: Ben Shacklett

109 Advanced Machine Vision Systems for Agricultural Applications (Peer-review session)

Monday, 9:30am-12:00pm
Technical Community: ITSC - Information Technology, Sensors & Control Systems
Session Type: Oral Technical Session
Description: Advanced and new machine vision techniques for various agricultural applications. This session encourages author(s) to submit full papers for peer-review by April 1st.
Organizer: Yuzhen Lu, luyuzhen@msu.edu
Sponsoring Committee: ITSC-312 Machine Vision; **Co-Sponsors:**
Moderators: Md Sultan Mahmud

110 Connectivity, Cloud Computing, and Internet of Things in Agriculture and Natural Resources-LIGHTNING PANEL

Monday, 9:30am-12:00pm
Technical Community: ITSC - Information Technology, Sensors & Control Systems
Session Type: Lightning Oral Technical Session
Description: Focuses on the development and application of internet of things (IoT) and sensing networks for agriculture and natural resources.
Organizer: Hasan Seyyedhasani, seyyedhasani12@vt.edu

Sponsoring Committee: ITSC-254 Emerging Information Systems; **Co-Sponsors:** ITSC-217 Computational Methods, Simulations & Applications

Moderators: Shirin Ghatrehsamani

111 ITSC-Information Technology, Sensors & Control Systems POSTER SESSION A

Monday, 9:30am-12:00pm

Technical Community: ITSC - Information Technology, Sensors & Control Systems

Session Type: Poster Technical Session

Description: Poster session for submissions to the ITSC division.

Organizer: Long He, luh378@psu.edu

Sponsoring Committee: ITSC-01 POSTER SESSION; **Co-Sponsors:**

Moderators: Long He

112 Spectroscopic Sensing and Imaging for Agriculture and Food Systems

Monday, 9:30am-12:00pm

Technical Community: ITSC - Information Technology, Sensors & Control Systems

Session Type: Oral Technical Session

Description: Development and applications of spectroscopic sensing and imaging technologies for agrifood uses.

Organizer: Micah Lewis, micah.lewis@usda.gov

Sponsoring Committee: ITSC-348 Electromagnetics & Spectroscopy; **Co-Sponsors:**

Moderators: Micah Lewis, Mohammed Kamruzzaman

MS - Machinery Systems

113 Advances in Cotton Engineering I

Monday, 9:30am-12:00pm

Technical Community: MS - Machinery Systems

Session Type: Oral Technical Session

Description: The Advances in Cotton Engineering Session invites presentations focused on engineering research advancing cotton production, processing, and ginning.

Organizer: Sean Donohoe, sean.donohoe@usda.gov

Sponsoring Committee: MS-23/7/3 Cotton Engineering; **Co-Sponsors:**

Moderators: Sean Donohoe

114 Advances in Seeding, Tillage, and Crop Input Placement

Monday, 9:30am-12:00pm

Technical Community: MS - Machinery Systems

Session Type: Oral Technical Session

Description: This session will be about the placement of seeds, fertilizers, and pesticides in the soils of growing fields. Tillage topics will be encouraged to be included in this session because of the impact tillage practices can have on the placement of these items in the soil.

Organizer: Ed Brokesh, ebrokesh@ksu.edu

Sponsoring Committee: MS-49 Crop Production Systems, Machinery, and Logistics; **Co-Sponsors:** MS-54 Precision Agriculture

Moderators: Ed Brokesh

115 Innovations in Precision Agriculture and Smart Farming

Monday, 9:30am-12:00pm

Technical Community: MS - Machinery Systems

Session Type: Oral Technical Session

Description: Precision agriculture is integral to modern production practices. This session features novel research and development in precision agriculture and smart farming.

Organizer: Alex Thomasson, athomasson@abe.msstate.edu

Sponsoring Committee: MS-54 Precision Agriculture; **Co-Sponsors:**

Moderators: Alex Thomasson

116 Unmanned (Aerial and Ground) Applications for Crop Protection and Fertilizer Products

Monday, 9:30am-12:00pm

Technical Community: MS - Machinery Systems

Session Type: Oral Technical Session

Description: UAS has the potential of increasing the resolution of agricultural data and the efficiency of agricultural data collection operations. Additionally, UAS crop protection product or fertilizer applications could address the need of niche applications and substantially optimize or improve the efficiency of the operations. This session hosts UAS research in enhancing crop protection product and fertilizer applications.

Organizer: Rex Ruppert, rex.ruppert@cnhind.com

Sponsoring Committee: MS-23/6 Application Sys & US TAG ISO TC23/SC6; **Co-Sponsors:** MS-60 Unmanned Aerial Systems

Moderators: Rex Ruppert

NRES - Natural Resources & Environmental Systems

117 NRES Distinguished Lecture Series

Monday, 9:30am-12:00pm

Technical Community: NRES - Natural Resources & Environmental Systems

Session Type: Guest Speaker Session

Description:

Organizer: Derek Heeren, derek.heeren@unl.edu

Sponsoring Committee: NRES-04 Program Committee; **Co-Sponsors:**

Moderators: Derek Heeren

PAFS - Plant, Animal, & Facility Systems

118 Agri-Industrial Facility Design and Operation

Monday, 9:30am-12:00pm

Technical Community: PAFS - Plant, Animal, & Facility Systems

Session Type: Oral Technical Session

Description: This session is provided to gather researchers, educators, and industry experts to share experiences and innovations in designing and operating efficient agri-industrial facilities.

Organizer: Craig Smallegan, craig.smallegan@nucor.com

Sponsoring Committee: PAFS-20 Structures Group; **Co-Sponsors:** PRS-701 Physiochemical Properties of Biological Pr, PRS-702 Crop & Feed Processing & Storage, PRS-703 Food Processing

Moderators: Craig Smallegan, Gregory Williams

119 Animal Response to Environment

Monday, 9:30am-12:00pm

Technical Community: PAFS - Plant, Animal, & Facility Systems

Session Type: Oral Technical Session

Description: This session invites researchers, students, and industry exports to share research updates on advanced methods to quantify animals responses to their environment, improve current understanding of animal and human interactions, and methods to enhance welfare and productivity.

Organizer: John Linhoss, john.linhoss@auburn.edu

Sponsoring Committee: PAFS-40 Facilities & Systems Group; **Co-Sponsors:**

Moderators: John Linhoss

PRS - Processing Systems

120 Emerging Techniques for Measuring Properties of Biological Materials

Monday, 9:30am-12:00pm

Technical Community: PRS - Processing Systems

Session Type: Oral Technical Session

Description: Emerging techniques for measuring properties of biological materials addressing the current and modern approaches.

Organizer: Deandrae Smith, smit4870@purdue.edu

Sponsoring Committee: PRS-701 Physiochemical Properties of Biological Pr; **Co-Sponsors:** PRS-03 Processing Systems Standards Oversight

Moderators: Fuji Jian, Ewumbua Monono

121 Grain Postharvest Education - Challenges and Opportunities-GUEST SPEAKERS

Monday, 9:30am-12:00pm

Technical Community: PRS - Processing Systems

Session Type: Guest Speaker Session

Description: Presents opportunities and challenges faced by grain postharvest education with the goal to better postharvest practices, reducing waste and improving food security.

Organizer: Kingsly Ambrose, rambrose@purdue.edu

Sponsoring Committee: PRS-702 Crop & Feed Processing & Storage; **Co-Sponsors:**

Moderators: Marvin Petingco, Ma. Cristine Concepcion Ignacio

NRES - Natural Resources & Environmental Systems

122 NRES Community Update and Orientation

Monday, 12:00pm-1:00pm

Technical Community: NRES - Natural Resources & Environmental Systems

Session Type: Guest Speaker Session

Description: All interested in the NRES division are invited to attend.

Organizer: Laurent Ahiablame, lakomah@gmail.com

Sponsoring Committee: NRES-02 Executive Committee; **Co-Sponsors:**

Moderators: Laurent Ahiablame

ASABE Special Interest

123 Exploring Safety in the Era of Autonomous Agriculture-HYBRID

Monday, 2:30pm-5:00pm

Technical Community: ASABE Special Interest

Session Type: Hybrid Session-submitted abstracts and guest speakers

Description: Autonomous agriculture is expected to change the way we farm our lands. It will help us increase our yields and efficiency while decreasing our inputs and labor. New technology comes with new challenges, safety, and health concerns for farmworkers. This session aims to explore the new challenges and opportunities in agricultural robotic and automation safety.

Organizer: Salah Issa, salah01@illinois.edu

Sponsoring Committee: ASABE; **Co-Sponsors:** ESH-03 Standards, ESH-04 Technology Exchange, MS-03 Machine Systems Standards Oversight, MS-58 Agricultural Equipment Automation

Moderators: Salah Issa, Farzaneh Khorshandi

EOPD - Education, Outreach, & Professional Development

124 Equipping Students for Capstone through Labs and Experiential Learning

Monday, 2:30pm-5:00pm

Technical Community: EOPD - Education, Outreach, & Professional Development

Session Type: Oral Technical Session

Description: Both engineering and technology students benefit greatly from laboratory exercises and other means of providing experiential learning opportunities spread throughout the curriculum. This session will provide a means to share a variety of unique and meaningful ways experiential learning is implemented across curricula including incorporating technologies like generative AI. Examples of laboratory exercises, demonstrations or activities for both engineering and technology students are encouraged.

Organizer: John Long, john.m.long@okstate.edu

Sponsoring Committee: EOPD-205 Engineering Technology & Management Education; **Co-Sponsors:** EOPD-203 Undergraduate & Graduate Instruction

Moderators: Aaron Turner

ES - Energy Systems

125 Value-Added Chemicals Products and Materials towards Circular Bioeconomy

Monday, 2:30pm-5:00pm

Technical Community: ES - Energy Systems

Session Type: Oral Technical Session

Description: This session will entertain topics related to producing chemicals and materials from agricultural derived sources using both biochemical and thermochemical approaches. Additionally, this session will accept papers that discuss innovative ways to utilize biobased derived materials and chemicals.

Organizer: Mi Li, mli47@utk.edu

Sponsoring Committee: ES-220 Bio-based Energy, Fuels and Products; **Co-Sponsors:**

Moderators: Steve Chmely, Mi Li

ESH - Ergonomics, Safety & Health

126 Advances in Farm Safety: Surveillance, Interventions, and Assistive Technologies

Monday, 2:30pm-5:00pm

Technical Community: ESH - Ergonomics, Safety & Health

Session Type: Oral Technical Session

Description: Agriculture remains one of the most hazardous industries, necessitating ongoing efforts in health and safety. Despite these efforts, many agricultural workers and their families continue to face significant risks. Research, engineering design, and educational programming are crucial to ensure that interventions and technologies enhance safety without introducing new hazards. This session will explore the latest advancements in assistive technologies, interventions, and surveillance programs designed to prevent injury and illness.

Organizer: Salah Issa, salah01@illinois.edu

Sponsoring Committee: ESH-04 Technology Exchange; **Co-Sponsors:**

Moderators: Jaime Thissen

ITSC - Information Technology, Sensors & Control Systems

127 AI-Driven Tools and Technologies for High Throughput Phenotyping

Monday, 2:30pm-5:00pm

Technical Community: ITSC - Information Technology, Sensors & Control Systems

Session Type: Oral Technical Session

Description: Focuses on recent innovations in artificial intelligence-based systems for high throughput phenotyping for crops and animal production systems.

Organizer: Shih-Fang Chen, sfchen@ntu.edu.tw

Sponsoring Committee: ITSC-348 Electromagnetics & Spectroscopy; **Co-Sponsors:**

Moderators: Shih-Fang Chen, Haibo Yao

128 Analytical, Computational and Instrumentation Advances for Biosensing

Monday, 2:30pm-5:00pm

Technical Community: ITSC - Information Technology, Sensors & Control Systems

Session Type: Oral Technical Session

Description: This session provides attendees with the latest information on analytical, computational, and instrumentation advances for biosensor development for food and agriculture.

Organizer: Juhong Chen, jchen@ucr.edu

Sponsoring Committee: ITSC-230 Biosensors; **Co-Sponsors:**

Moderators: Juhong Chen, Saad Sharief

129 Machine Vision for Data-Driven Crop Management-LIGHTNING PANEL

Monday, 2:30pm-5:00pm

Technical Community: ITSC - Information Technology, Sensors & Control Systems

Session Type: Lightning Oral Technical Session

Description: Focuses on all machine vision innovation and applications in Data-Driven Crop Management.

Organizer: Daeun Choi, dana.choi@ufl.edu

Sponsoring Committee: ITSC-312 Machine Vision; **Co-Sponsors:**

Moderators: Uchechukwu Ilodibe

130 Mechatronics and Actuation in Agricultural Robots

Monday, 2:30pm-5:00pm

Technical Community: ITSC - Information Technology, Sensors & Control Systems

Session Type: Oral Technical Session

Description: Focuses on the development of mechatronics and actuation components in agricultural robots.

Organizer: Congliang Zhou, congliangzhou@agcenter.lsu.edu

Sponsoring Committee: ITSC-318 Mechatronics & Biorobotics; **Co-Sponsors:**

Moderators: Congliang Zhou, Wenhao Liu

MS - Machinery Systems

131 Precision Applications of Crop Protection and Fertilizer Products

Monday, 2:30pm-5:00pm

Technical Community: MS - Machinery Systems

Session Type: Oral Technical Session

Description: Precision application becomes a more important research and technical area as it is a key tool to reduce environmental impact while maximizing the agricultural production. Precision crop protection or fertilizer applications can provide great benefits by optimizing agricultural inputs while maximizing its output. This session accommodates research work in precision crop protection product and fertilizer application to optimize crop protection product or fertilizer use in agriculture.

Organizer: Rex Ruppert, rex.ruppert@cnhind.com

Sponsoring Committee: MS-23/6 Application Sys & US TAG ISO TC23/SC6; **Co-Sponsors:** MS-54 Precision Agriculture

Moderators: Rex Ruppert

132 Robotics and Mechanization for Specialty Crops

Monday, 2:30pm-5:00pm

Technical Community: MS - Machinery Systems

Session Type: Oral Technical Session

Description: The Robotics and Mechanization for Specialty Crops session will cover all possible robotic and mechanical technology innovations and adoptions for specialty crops including fruits, vegetables, and many other horticultural crops including floriculture.

Organizer: Hao Gan, hgan1@utk.edu

Sponsoring Committee: MS-48 Specialty Crop Engineering; **Co-Sponsors:** MS-54 Precision Agriculture

Moderators: Hao Gan

NRES - Natural Resources & Environmental Systems

133 Advances in Agrohydrological Sustainability through Modeling: Regenerative Agriculture

Monday, 2:30pm-5:00pm

Technical Community: NRES - Natural Resources & Environmental Systems

Session Type: Oral Technical Session

Description: In the pursuit of sustainable agricultural practices, the integration of cutting-edge modeling techniques and Unmanned Aerial System (UAS) technologies has emerged as a powerful approach to enhance agrohydrological sustainability. This technical session aims to explore the latest developments, methodologies, and applications that harness the potential of modeling and UAS tools to address critical challenges in agricultural water management under the present and changing future climate. Topics of interest include, but are not limited to:

- Hydrological Modeling: Modeling approaches to simulate hydrology and water quality within agricultural landscapes (fields and watersheds) under a variety of agricultural practices.
- UAS Applications: Utilization of UAS for collecting high-resolution spatial data related to soil and crop health.
- Climate change adaptation: Modeling approaches to simulate effects of climate-smart agricultural practices on crop production and hydrology under changing future climate.
- Data Integration and Analysis: Methodologies for integrating diverse datasets into comprehensive agrohydrological models.
- Decision Support Systems: Advancements in developing decision support tools that integrate modeling and UAS information to assist farmers, water resource managers, and policymakers in optimizing agricultural water management practices.

Organizer: Sayantan Samanta, ssamanta@tamu.edu

Sponsoring Committee: NRES-21 Hydrology Group; **Co-Sponsors:**
Moderators: Sayantan Samanta, Arun Bawa

134 Advances in Micro-Irrigation and Sprinkler Irrigation Systems

Monday, 2:30pm-5:00pm
Technical Community: NRES - Natural Resources & Environmental Systems
Session Type: Oral Technical Session
Description: One of the most significant contributions of technology to irrigation management is the development of precision irrigation techniques such as micro, drip, etc. This session will invite presentations on advances in micro-irrigation techniques in terms of development, application in irrigation management.
Organizer: Vivek Sharma, vsharma1@ufl.edu
Sponsoring Committee: NRES-24 Irrigation; **Co-Sponsors:** NRES-245 Microirrigation
Moderators: Sandra Guzman

135 Erosion Control and Sediment Transport Research

Monday, 2:30pm-5:00pm
Technical Community: NRES - Natural Resources & Environmental Systems
Session Type: Oral Technical Session
Description: Sediment (caused by soil erosion) is regarded as the most common pollutant in rivers, streams, lakes and reservoirs in the United States. This session invites presentations related to soil erosion and sediment transport research on agricultural and urban landscapes. Both experimental and modeling studies will be included.
Organizer: Anita Thompson, amthompson2@wisc.edu
Sponsoring Committee: NRES-22 Soil Erosion and Water Quality; **Co-Sponsors:** NRES-223 Erosion Control Research
Moderators: Anita Thompson

136 Green Infrastructure-GUEST SPEAKERS

Monday, 2:30pm-5:00pm
Technical Community: NRES - Natural Resources & Environmental Systems
Session Type: Guest Speaker Session
Description: This is an invited speaker session focused on green infrastructure applications.
Organizer: Trisha Moore, tlcmoore@ksu.edu
Sponsoring Committee: NRES-25 Streams, Reservoirs, and Wetlands Group; **Co-Sponsors:** NRES-21 Hydrology Group, NRES-28 Ecological Engineering
Moderators: Trisha Moore, Eban Bean

137 Innovations and Insights in Hydrology: Bridging Theory, Application, and Emerging Trends

Monday, 2:30pm-5:00pm
Technical Community: NRES - Natural Resources & Environmental Systems
Session Type: Oral Technical Session
Description: This session invites the presentation of innovative ideas, results, and applications in both theoretical and applied hydrology. Subjects may include hydrologic and biogeochemical monitoring and modeling, anthropogenic impacts to the hydrologic cycle, innovations in water resources infrastructure, application of remotely-sensed observations, hydrogeologic applications, climate impacts, and more. We also encourage submissions related to surface and groundwater hydrology that may not fit within other sessions, as well as contributions from students, early-career scientists, and those addressing the needs and future directions of the NRES-21 community.
Organizer: Rebecca Muenich, rlogsdo@uark.edu
Sponsoring Committee: NRES-21 Hydrology Group; **Co-Sponsors:** NRES-21 Hydrology Group

Moderators: Rebecca Muenich, Arghajeet Saha

138 Open-Source "pyfao56" Evapotranspiration and Water Balance Tool for Water Management

Monday, 2:30pm-5:00pm

Technical Community: NRES - Natural Resources & Environmental Systems

Session Type: Oral Technical Session

Description: This session will explore the development and diverse applications of the open-source "pyfao56" tool, designed for standardized evapotranspiration (ET) and water balance calculations. Built on the widely recognized FAO-56 and ASCE ET methodologies, pyfao56 offers a versatile and customizable platform for irrigation scheduling, crop modeling, and water resource management. Attendees will learn about the tool's implementation in various research and practical settings, including its use in forecasting, soil moisture monitoring, and integration with advanced hydrologic and crop growth models. The session will also highlight ongoing improvements and encourage collaboration among participants to further refine and expand pyfao56's capabilities. Join us to discover how this powerful, accessible tool can revolutionize water management practices and drive innovation in the field.

Organizer: Kendall DeJonge, kendall.dejonge@usda.gov

Sponsoring Committee: NRES-24 Irrigation; **Co-Sponsors:**

Moderators: Kendall DeJonge

139 Role of Biochar in Improving Soil and Water Quality in Agricultural Systems

Monday, 2:30pm-5:00pm

Technical Community: NRES - Natural Resources & Environmental Systems

Session Type: Oral Technical Session

Description: Biochar is added to soil to improve water retention, increase plant nutrient availability, enhance microbial activity, boost crop yields, and mitigate the adverse effects of climate change through soil carbon sequestration. The proposed session will focus on how biochar can affect the hydrological processes and the fate and transport of nutrients in soils and the role of engineering biochar to enhance biochar properties relevant to its use for various agricultural applications.

Organizer: Jasmeet Lamba, jsl0005@auburn.edu

Sponsoring Committee: NRES-22 Soil Erosion and Water Quality; **Co-Sponsors:** NRES-224 Sediment and Associated Pollutants

Moderators: Jasmeet Lamba

PAFS - Plant, Animal, & Facility Systems

140 Food and Medicinal Plant Production in Indoor Environments

Monday, 2:30pm-5:00pm

Technical Community: PAFS - Plant, Animal, & Facility Systems

Session Type: Oral Technical Session

Description: This session will include research presentations from researchers, educators, and industry experts to delve into advanced indoor cultivation methods for food and medicinal plant production.

Organizer: Phillipe Addo, philip.addo@mail.mcgill.ca

Sponsoring Committee: PAFS-30 Plant Systems Group; **Co-Sponsors:**

Moderators: Phillipe Addo, Mark Lefsrud

141 Precision (SMART) Animal Management-LIGHTNING SESSION

Monday, 2:30pm-5:00pm

Technical Community: PAFS - Plant, Animal, & Facility Systems

Session Type: Lightning Oral Technical Session

Description: This lightning session provides a unique platform to discuss cutting-edge and innovative precision technologies for enhancing animal management practices.

Organizer: Josh Jackson, joshjackson@uky.edu

Sponsoring Committee: PAFS-40 Facilities & Systems Group; **Co-Sponsors:**

Moderators: Josh Jackson

142 Sustainability and Biosecurity Management in Livestock and Poultry Facilities

Monday, 2:30pm-5:00pm

Technical Community: PAFS - Plant, Animal, & Facility Systems

Session Type: Oral Technical Session

Description: This session will include presentations from researchers, educators, and industry experts to share research experiences and discuss solutions for resource usage, sustainability, and biosecurity in livestock and poultry facilities.

Organizer: Rick Stowell, richard.stowell@unl.edu

Sponsoring Committee: PAFS-40 Facilities & Systems Group; **Co-Sponsors:**

Moderators: Rick Stowell

NRES - Natural Resources & Environmental Systems

143 NRES-Advances in Environmental Systems POSTER SESSION

Monday, Evening (5:00-7:00)

Technical Community: NRES - Natural Resources & Environmental Systems

Session Type: Poster Technical Session

Description: NRES Poster Session.

Organizer: Jaime Thissen, jaimethissen1@gmail.com

Sponsoring Committee: NRES-04 Program Committee; **Co-Sponsors:**

Moderators: Jaime Thissen

ASE - Applied Science & Engineering

201 Forest Soil, Water, and Air Ecosystems

Tuesday, 9:30am-12:00pm

Technical Community: ASE - Applied Science & Engineering

Session Type: Oral Technical Session

Description: Research related to the ecosystems for production and management of forest biomass.

Organizer: Johnny Grace, johnny.m.grace@usda.gov

Sponsoring Committee: ASE-12 Forest Engineering; **Co-Sponsors:** NRES-21 Hydrology Group, NRES-22 Soil Erosion and Water Quality, NRES-25 Streams, Reservoirs, and Wetlands Group

Moderators: Johnny Grace

CBS - Circular Bioeconomy Systems

202 Enabling Technologies in Creating Circular Bioeconomy Systems

Tuesday, 9:30am-12:00pm

Technical Community: CBS - Circular Bioeconomy Systems

Session Type: Oral Technical Session

Description: This session seeks innovations in digital technologies, biotechnology, material recovery (including resources, water, and energy) , and sustainable practices that enable and advance the transition toward a circular bioeconomy.

Organizer: Ziynet Boz, ZiynetBoz@ufl.edu

Sponsoring Committee: CBSI; **Co-Sponsors:** ITSC-318 Mechatronics & Biorobotics, MS-49 Crop Production Systems, Machinery, and Logistics, NRES-26 Sustainable Land Resources, NRES-27 Ag Byproducts & Animal Mortality Systems, PAFS-07/1 Agri-Industrial Facility Design and Operation, PAFS-30 Plant Systems Group, PAFS-40 Facilities & Systems Group, PRS-280 Bioconversion and Bioprocesses, PRS-702 Crop & Feed Processing & Storage, ASE-16 Engineering for Sustainability, ES-220 Bio-based Energy, Fuels and Products, ES-210 Renewable Power Generation

Moderators: Ziynet Boz

EOPD - Education, Outreach, & Professional Development

203 Innovation and Integration in Education and Outreach-LIGHTNING PANEL

Tuesday, 9:30am-12:00pm

Technical Community: EOPD - Education, Outreach, & Professional Development

Session Type: Lightning Oral Technical Session

Description: This session provides opportunity for many individuals to share a variety of new and interesting experiences intended to infuse new ideas into education, outreach and professional development endeavors. The session will include multiple rounds of short lightning talks followed by a break after each set to allow for discussion among presenters and attendees.

Organizer: John Long, john.m.long@okstate.edu

Sponsoring Committee: EOPD-203 Undergraduate & Graduate Instruction; **Co-Sponsors:** EOPD-205 Engineering Technology & Management Education, EOPD-208 Extension

Moderators: Kevin Moore, David Mabie

ES - Energy Systems

204 Thermochemical and Catalytic Conversion of Biomass to Biofuels and Chemicals

Tuesday, 9:30am-12:00pm

Technical Community: ES - Energy Systems

Session Type: Oral Technical Session

Description: The session would entertain topics pertinent to catalytic conversion of biomass to biofuels and/or syngas, and chemicals via thermochemical conversion methods including gasification, pyrolysis, liquefaction and other innovative techniques. High interest in the conversion of biomass to biofuels by thermochemical technologies

Organizer: Mi Li, mli47@utk.edu

Sponsoring Committee: ES-220 Bio-based Energy, Fuels and Products; **Co-Sponsors:**

Moderators: Hossein Jahromi, Toufiq Reza

ESH - Ergonomics, Safety & Health

205 Agricultural Machinery, Robotics, and Technology: New Risks & Safety Opportunities

Tuesday, 9:30am-12:00pm

Technical Community: ESH - Ergonomics, Safety & Health

Session Type: Oral Technical Session

Description: Safety and Risk management focus is needed on research or development projects involving various forms of electronic/digital technology in agriculture. This includes, but is not limited to, field and farmstead automation, robotics, driverless systems, and the associated safety and risk implications for the public and operators.

Organizer: Salah Issa, salah01@illinois.edu

Sponsoring Committee: ESH-04 Technology Exchange; **Co-Sponsors:**

Moderators: Aaron Etienne

ITSC - Information Technology, Sensors & Control Systems

206 3D Machine Vision for Sensing and Automation-LIGHTNING PANEL

Tuesday, 9:30am-12:00pm

Technical Community: ITSC - Information Technology, Sensors & Control Systems

Session Type: Lightning Oral Technical Session

Description: Focuses on the development and application of3D imaging technologies for agricultural sensing and automation.

Organizer: Dongyi Wang, dongyiw@uark.edu

Sponsoring Committee: ITSC-312 Machine Vision; **Co-Sponsors:**

Moderators: Deniel Morris

207 Advanced Machine Learning-II-LIGHTNING PANEL

Tuesday, 9:30am-12:00pm

Technical Community: ITSC - Information Technology, Sensors & Control Systems

Session Type: Lightning Oral Technical Session

Description: Focuses on advanced machine learning techniques for plant and animal characteristics and behaviors.

Organizer: Joe Dvorak, joe.dvorak@uky.edu

Sponsoring Committee: ITSC-254 Emerging Information Systems; **Co-Sponsors:**

Moderators: Joe Dvorak

208 Biosensors and Bioinstrumentation for One Health

Tuesday, 9:30am-12:00pm

Technical Community: ITSC - Information Technology, Sensors & Control Systems

Session Type: Oral Technical Session

Description: This session provides attendees with the latest information on biosensor development and bioinstrumentation applications in One Health.

Organizer: Juhong Chen, jchen@ucr.edu

Sponsoring Committee: ITSC-230 Biosensors; **Co-Sponsors:**

Moderators: Juhong Chen

209 Digital Twins, DEM, and CFD Applications in Agriculture-LIGHTNING PANEL

Tuesday, 9:30am-12:00pm

Technical Community: ITSC - Information Technology, Sensors & Control Systems

Session Type: Lightning Oral Technical Session

Description: This session focuses on developing and applying computational simulations (DEM, FEM, etc.) for modeling and addressing current issues in agricultural and biological engineering.

Organizer: Hanwook Chung, hwchung@iastate.edu

Sponsoring Committee: ITSC-217 Computational Methods, Simulations & Applications; **Co-Sponsors:**

Moderators: Hanwook Chung, Mehari Tekeste

210 From Ideas to Commercialization-PANEL

Tuesday, 9:30am-12:00pm

Technical Community: ITSC - Information Technology, Sensors & Control Systems

Session Type: Panel Discussion

Description: An engineer entrepreneur will be selected to host the panel discussion, and 3-5 speakers with expertise in entrepreneurship from various industries will be invited to talk about how to bring ideas to commercialization. Q&A session with a short workshop on developing an elevator pitch for your research will follow. Two and a half hours will be reserved for this panel session.

Organizer: Evangelyn Alocilja, alocilja@msu.edu

Sponsoring Committee: ITSC-230 Biosensors; **Co-Sponsors:** E-2050 Global Engagement

Moderators: Evangelyn Alocilja, Saad Sharief

211 ITSC-Information Technology, Sensors & Control Systems POSTER SESSION B

Tuesday, 9:30am-12:00pm

Technical Community: ITSC - Information Technology, Sensors & Control Systems

Session Type: Poster Technical Session

Description: Poster session for submissions to the ITSC division.

Organizer: Long He, luh378@psu.edu

Sponsoring Committee: ITSC-01 POSTER SESSION; **Co-Sponsors:**

Moderators: Long He

MS - Machinery Systems

212 Advances in Cotton Engineering II

Tuesday, 9:30am-12:00pm

Technical Community: MS - Machinery Systems

Session Type: Oral Technical Session

Description: The Advances in Cotton Engineering Session invites presentations focused on engineering research advancing cotton production, processing, and ginning.

Organizer: Sean Donohoe, sean.donohoe@usda.gov
Sponsoring Committee: MS-23/7/3 Cotton Engineering; **Co-Sponsors:**
Moderators: Sean Donohoe

213 Application Technology Innovations for Crop Protection Product and Fertilizer

Tuesday, 9:30am-12:00pm
Technical Community: MS - Machinery Systems
Session Type: Oral Technical Session
Description: Innovations in application technologies are important to protect crops from its harms by suppressing or controlling weeds/pests/diseases and promote growth and production by providing better growing environments and conditions. Innovations are keys to improve crop protection product and fertilizer applications while reducing their impact in the environment. This session hosts innovation in application technologies to advance crop protection product and fertilizer applications.
Organizer: Rex Ruppert, rex.ruppert@cnhind.com
Sponsoring Committee: MS-23/6 Application Sys & US TAG ISO TC23/SC6; **Co-Sponsors:**
Moderators: Rex Ruppert

214 Machinery Systems and Task Optimization Through Data Analysis

Tuesday, 9:30am-12:00pm
Technical Community: MS - Machinery Systems
Session Type: Oral Technical Session
Description: This session will be about the collection of data and its analysis while conducting crop production tasks. This data collection and analysis can be for precision ag requirements or machinery management/task optimization.
Organizer: Ed Brokesh, ebrokesh@ksu.edu
Sponsoring Committee: MS-49 Crop Production Systems, Machinery, and Logistics; **Co-Sponsors:**
Moderators: Jason Werning

NRES - Natural Resources & Environmental Systems

215 Advances in Agrohydrological Sustainability through Modeling: Tools

Tuesday, 9:30am-12:00pm
Technical Community: NRES - Natural Resources & Environmental Systems
Session Type: Oral Technical Session
Description: In the pursuit of sustainable agricultural practices, the integration of cutting-edge modeling techniques and Unmanned Aerial System (UAS) technologies has emerged as a powerful approach to enhance agrohydrological sustainability. This technical session aims to explore the latest developments, methodologies, and applications that harness the potential of modeling and UAS tools to address critical challenges in agricultural water management under the present and changing future climate. Topics of interest include, but are not limited to:

- Hydrological Modeling: Modeling approaches to simulate hydrology and water quality within agricultural landscapes (fields and watersheds) under a variety of agricultural practices.
- UAS Applications: Utilization of UAS for collecting high-resolution spatial data related to soil and crop health.
- Climate change adaptation: Modeling approaches to simulate effects of climate-smart agricultural practices on crop production and hydrology under changing future climate.
- Data Integration and Analysis: Methodologies for integrating diverse datasets into comprehensive agrohydrological models.

- Decision Support Systems: Advancements in developing decision support tools that integrate modeling and UAS information to assist farmers, water resource managers, and policymakers in optimizing agricultural water management practices.

Organizer: Sayantan Samanta, ssamanta@tamu.edu
Sponsoring Committee: NRES-21 Hydrology Group; **Co-Sponsors:**
Moderators: Sayantan Samanta, Arun Bawa

216 Drainage Design, Monitoring, and Modeling

Tuesday, 9:30am-12:00pm
Technical Community: NRES - Natural Resources & Environmental Systems
Session Type: Oral Technical Session
Description: 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, practice, and education of drainage across diverse landscapes and climates. Authors are encouraged to submit presentations based on (but not limited to) the following topics:

- Drainage expansion in northern latitudes.
- Case studies showing unique application of drainage modeling, drainage design, and drainage monitoring.
- 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.
- Model applications in watersheds/regions dominated by surface/subsurface drainage.

Organizer: Mark Williams, mark.williams2@usda.gov
Sponsoring Committee: NRES-23 Drainage Group; **Co-Sponsors:** NRES-21 Hydrology Group, NRES-28 Ecological Engineering
Moderators: Mark Williams, Manal Askar

217 Extension: Empowering our Stakeholders through New Technologies and Machine Learning Techniques

Tuesday, 9:30am-12:00pm
Technical Community: NRES - Natural Resources & Environmental Systems
Session Type: Oral Technical Session
Description: Inclusion of an extension session that can bring different stakeholders for discussion (e.g., panel) and/or presentations for what their objectives and impacts are and how we can work together to empower them for a changing climate. How to increase adoption of new technologies.
Organizer: Sandra Guzman, sandra.guzmangut@ufl.edu
Sponsoring Committee: NRES-24 Irrigation; **Co-Sponsors:** NRES-245 Microirrigation
Moderators: Vivek Sharma

218 Nature-Based Solutions: Innovations in Research and Application-HYBRID

Tuesday, 9:30am-12:00pm
Technical Community: NRES - Natural Resources & Environmental Systems
Session Type: Hybrid Session-submitted abstracts and guest speakers
Description: Nature-based solutions (NBS) incorporate natural features and processes to protect or sustainably use land and water resources, while incorporating socio-environmental concerns to improve communities and the ecosystems they inhabit. NBS will become strategically important as risks increase to both natural and built

systems from climate change and land use conversion. This session seeks to discuss research in NBS including novel NBS, quantification of benefits of NBS, policy aspects regarding the use or implementation of NBS, social considerations of NBS, and application/implementation of NBS, such as green infrastructure, land conservation, and coastal installations. We would welcome global presentations from industry and academia and from applications in all kinds of landscapes, including agricultural, urban, and mixed-use.

Organizer: Kira Hansen, kira.hansen@kimley-horn.com

Sponsoring Committee: NRES-21 Hydrology Group; **Co-Sponsors:** NRES-25 Streams, Reservoirs, and Wetlands Group, NRES-26 Sustainable Land Resources, NRES-28 Ecological Engineering

Moderators: Kira Hansen, Whitney Pagan

219 Nutrient Transport and Cycling: Measurement and Modeling

Tuesday, 9:30am-12:00pm

Technical Community: NRES - Natural Resources & Environmental Systems

Session Type: Oral Technical Session

Description: This session solicits presentations on all aspects of nutrient (N and P) cycling and transport measurement and modeling at plot, field and watershed scales in agricultural and urban systems. The focus will be on nitrogen and phosphorus, but other nutrients that affect agricultural productivity and water quality will also be considered.

Organizer: Rabin Bhattarai, rbhatta2@illinois.edu

Sponsoring Committee: NRES-22 Soil Erosion and Water Quality; **Co-Sponsors:**

Moderators: Rabin Bhattarai

220 Ontario Perspective on Sustainable Manure Management-GUEST SPEAKERS

Tuesday, 9:30am-12:00pm

Technical Community: NRES - Natural Resources & Environmental Systems

Session Type: Guest Speaker Session

Description: Manure land application can contribute to soil nutrient imbalances, particularly in regions that have many large-scale animal productions. When manure production exceeds the nutrient needs of surrounding fields, the excess can lead to environmental concerns, while transporting manure to more distant fields can be cost prohibitive. This session will address regional nutrient management issues, featuring experts from local government agencies, extension, research, and industry, who will share their perspectives and explore potential solutions. A newly developed manure treatment technology decision-support tool will also be presented. The session will conclude with a panel discussion, providing interactive dialogue and knowledge exchange opportunities.

Organizer: Teng Teeh Lim, limt@missouri.edu

Sponsoring Committee: NRES-27 Ag By-products & Animal Mortality Management; **Co-Sponsors:**

Moderators: Teng Teeh Lim, Richard Stowell

221 Water Management and Soil Health under Water Scarcity and Extreme Events

Tuesday, 9:30am-12:00pm

Technical Community: NRES - Natural Resources & Environmental Systems

Session Type: Oral Technical Session

Description: Water scarcity and extreme weather events continue to be concerns for agricultural producers and the public. Water management decisions can be made and planned for to address these likelihoods but application of soil health practices in many land uses can also change and/or improve what water management decisions must be made. With improved soil health and water management, water scarcity and extreme weather events can be better navigated.

Organizer: Carolyn Jones, carolyn.jones@usda.gov

Sponsoring Committee: NRES-21 Hydrology Group; **Co-Sponsors:** NRES-21 Hydrology Group, NRES-22 Soil Erosion and Water Quality, NRES-24 Irrigation Group, NRES-242 Surface Irrigation & Water Supply, NRES-25 Streams, Reservoirs, and Wetlands Group, NRES-26 Sustainable Land Resources

Moderators: Carolyn Jones, Sushant Mehan

PAFS - Plant, Animal, & Facility Systems

222 PAFS-Plant, Animal, & Facility Systems POSTER SESSION

Tuesday, 9:30am-12:00pm

Technical Community: PAFS - Plant, Animal, & Facility Systems

Session Type: Poster Technical Session

Description: This is the poster session for all Plant, Animal, & Facility Systems Committees.

Organizer: Suzanne Leonard, smleona4@ncsu.edu

Sponsoring Committee: PAFS-01 POSTER SESSION; **Co-Sponsors:**

Moderators: Suzanne Leonard

PRS - Processing Systems

223 Physical and Chemical Properties of Food, Agricultural and Biological Materials I

Tuesday, 9:30am-12:00pm

Technical Community: PRS - Processing Systems

Session Type: Oral Technical Session

Description: Physical and chemical properties of food, agricultural and biological materials that include current and modern cutting-edge technologies in measurement.

Organizer: Deandrae Smith, smit4870@purdue.edu

Sponsoring Committee: PRS-701 Physiochemical Properties of Biological Pr; **Co-Sponsors:** PRS-03 Processing Systems Standards Oversight

Moderators: Clairmont Clementson, Emmanuel Baidhe

224 Physical Properties and Modeling Related to Crop and Feed Drying, Handling, and Storage

Tuesday, 9:30am-12:00pm

Technical Community: PRS - Processing Systems

Session Type: Oral Technical Session

Description: Physical properties and modeling related to crop and feed drying, handling, and storage. The session deals with various modern aspects of measurement and modeling where physical properties are the integral part.

Organizer: Marvin Petingco, mpetingco@ksu.edu

Sponsoring Committee: PRS-702 Crop & Feed Processing & Storage; **Co-Sponsors:** PRS-701 Physiochemical Properties of Biological Pr

Moderators: Ma. Cristine Concepcion Ignacio, Shikhadri Mahanta

ASE - Applied Science & Engineering

225 Conversion and Applications of Wood-Derived Materials for Circular Biosystems

Tuesday, 2:30pm-5:00pm

Technical Community: ASE - Applied Science & Engineering

Session Type: Oral Technical Session

Description: Production of materials from woody biomass, and the properties and uses of those materials.

Organizer: Stephen Chmely, sc411@psu.edu

Sponsoring Committee: ASE-12 Forest Engineering; **Co-Sponsors:** ES-220 Bio-based Energy, Fuels and Products, CBSI-Circular Bioeconomy Systems Institute

Moderators: Stephen Chmely

E-2050 - Global Engagement

226 Technology Trends and Career Opportunities in the U.S. and Korea-HYBRID

Tuesday, 2:30pm-5:00pm

Technical Community: E-2050 - Global Engagement

Session Type: Hybrid Session-submitted abstracts and guest speakers

Description: This session aims to explore current technological trends in agricultural and biological engineering while identifying career opportunities in both the U.S. and Korea. It is designed to foster collaboration between agricultural and biological engineers in the U.S. and Korea, as well as promote international partnerships between Korea and other countries.

Organizer: Jaehak Jeong, jeongj@tamu.edu

Sponsoring Committee: E-2050 Global Engagement; **Co-Sponsors:**

Moderators: Jaehak Jeong, Anjin Chang

EOPD - Education, Outreach, & Professional Development

227 Identifying Common Attributes of an Agricultural and Biological Engineering Graduate-RAP

Tuesday, 2:30pm-5:00pm

Technical Community: EOPD - Education, Outreach, & Professional Development

Session Type: Rap Session

Description: This interactive working group aims to identify and discuss the core competencies, experiences, and attributes that contribute to a BE graduate's effectiveness in the field.

Organizer: John Long, john.m.long@okstate.edu

Sponsoring Committee: EOPD-203 Undergraduate & Graduate Instruction; **Co-Sponsors:** EOPD-204 Engineering & Technology Accreditation

Moderators: John Classen

ES - Energy Systems

228 Clean Energy and Agrivoltiacs

Tuesday, 2:30pm-5:00pm

Technical Community: ES - Energy Systems

Session Type: Oral Technical Session

Description: Join us to learn how renewable energy and agrivoltaics are paving the way for a sustainable and resilient future for human development. Experts will delve into the transformative potential of integrating clean energy technologies with agricultural practices and discuss cutting-edge research and development in renewable energy.

Organizer: Jaime Thissen, jaimethissen1@gmail.com

Sponsoring Committee: ES-210 Renewable Power Generation Committee; **Co-Sponsors:**
Moderators: Jaime Thissen, Fei Yu

ESH - Ergonomics, Safety & Health

229 ESH-Ergonomics, Safety, & Health POSTER SESSION

Tuesday, 2:30pm-5:00pm
Technical Community: ESH - Ergonomics, Safety & Health
Session Type: Poster Technical Session
Description: Agriculture is one of the most hazardous industries. Injury and illness prevention efforts are the primary effort in the field of ergonomics, safety, and health. However, many employees, operators, and families often experience life-altering injuries or illnesses requiring worksite modifications. Posters are welcomed for safety education programming, technologies, and program efforts that highlight objective evaluation of these efforts.
Organizer: Salah Issa, salah01@illinois.edu
Sponsoring Committee: ESH-04 Technology Exchange; **Co-Sponsors:**
Moderators: Serap Gorucu

ITSC - Information Technology, Sensors & Control Systems

230 Generative AI and Large Multimodal model for Agriculture & Natural Resources-LIGHTNING PANEL

Tuesday, 2:30pm-5:00pm
Technical Community: ITSC - Information Technology, Sensors & Control Systems
Session Type: Lightning Oral Technical Session
Description: Focuses on the development of new or innovative machine learning and artificial intelligence approaches for applications in natural resources.
Organizer: Shirin Ghatrehsamani, spg5994@psu.edu
Sponsoring Committee: ITSC-254 Emerging Information Systems; **Co-Sponsors:**
Moderators: Jing Zhou

231 Hyperspectral Imaging: Advances in Technologies, Analytics, and Applications-LIGHTNING PANEL

Tuesday, 2:30pm-5:00pm
Technical Community: ITSC - Information Technology, Sensors & Control Systems
Session Type: Lightning Oral Technical Session
Description: Focuses on submissions addressing the use of hyperspectral imaging technologies for agrifood applications. Topics cover from hardware design, to algorithm development and validation, and to research and production applications.
Organizer: Alireza Pourreza, apourreza@ucdavis.edu
Sponsoring Committee: ITSC-348 Electromagnetics & Spectroscopy; **Co-Sponsors:**
Moderators: Nader Ekramirad, Dongyi Wang

232 Machine Vision Applications in Agriculture and Food Processing-LIGHTNING PANEL

Tuesday, 2:30pm-5:00pm
Technical Community: ITSC - Information Technology, Sensors & Control Systems
Session Type: Lightning Oral Technical Session
Description: This session focuses on machine vision systems for applications in agriculture and food processing.
Organizer: Yuzhen Lu, luyuzhen@msu.edu
Sponsoring Committee: ITSC-312 Machine Vision; **Co-Sponsors:**

Moderators: Yuzhen Lu, Young Chang

233 Robotics and AI-Enabled Robotics for Production Agriculture-LIGHTNING PANEL

Tuesday, 2:30pm-5:00pm

Technical Community: ITSC - Information Technology, Sensors & Control Systems

Session Type: Lightning Oral Technical Session

Description: Focuses on the development and application of robotics and AI -enabled robotics technologies for production systems in agriculture.

Organizer: Xin Zhang, xzhang@abe.msstate.edu

Sponsoring Committee: ITSC-318 Mechatronics & Biorobotics; **Co-Sponsors:**

Moderators: Xin Zhang

MS - Machinery Systems

234 Advances in Soil-Plant-Machine Dynamics and Systems Simulation

Tuesday, 2:30pm-5:00pm

Technical Community: MS - Machinery Systems

Session Type: Oral Technical Session

Description: This session is focused on the use of modeling and simulation to investigate interactions at the interface of soil, plant, and machine associated with machine systems.

Organizer: Brian Steward, bsteward@iastate.edu

Sponsoring Committee: MS-45 Soil-Plant-Machine Dynamics; **Co-Sponsors:** MS-23/7/2 Forage & Biomass Engineering, MS-48 Specialty Crop Engineering, MS-58 Agricultural Equipment Automation

Moderators: Heinz Bernhardt

235 Machinery Systems for Crop Production

Tuesday, 2:30pm-5:00pm

Technical Community: MS - Machinery Systems

Session Type: Oral Technical Session

Description: Session focused on advances in machinery systems that may not fit well into crop production sessions that are more narrowly defined.

Organizer: Ed Brokesh, ebrokesh@ksu.edu

Sponsoring Committee: MS-49 Crop Production Systems, Machinery, and Logistics; **Co-Sponsors:** MS-45 Soil-Plant-Machine Dynamics, MS-54 Precision Agriculture, MS-58 Agricultural Equipment Automation

Moderators: Ed Brokesh, Luke Fuhrer

236 MS-Machinery Systems POSTER SESSION

Tuesday, 2:30pm-5:00pm

Technical Community: MS - Machinery Systems

Session Type: Poster Technical Session

Description: Machinery Systems Poster Session.

Organizer: Robert Waggoner, robert.waggoner@agcocorp.com

Sponsoring Committee: MS-01 POSTER SESSION; **Co-Sponsors:** ASE-12 Forest Engineering

Moderators: Robert Waggoner

NRES - Natural Resources & Environmental Systems

237 Advances in Agrohydrological Sustainability through Modeling: Irrigation

Tuesday, 2:30pm-5:00pm

Technical Community: NRES - Natural Resources & Environmental Systems

Session Type: Oral Technical Session

Description: In the pursuit of sustainable agricultural practices, the integration of cutting-edge modeling techniques and Unmanned Aerial System (UAS) technologies has emerged as a powerful approach to enhance agrohydrological sustainability. This technical session aims to explore the latest developments, methodologies, and applications that harness the potential of modeling and UAS tools to address critical challenges in agricultural water management under the present and changing future climate. Topics of interest include, but are not limited to:

- Hydrological Modeling: Modeling approaches to simulate hydrology and water quality within agricultural landscapes (fields and watersheds) under a variety of agricultural practices.
- UAS Applications: Utilization of UAS for collecting high-resolution spatial data related to soil and crop health.
- Climate change adaptation: Modeling approaches to simulate effects of climate-smart agricultural practices on crop production and hydrology under changing future climate.
- Data Integration and Analysis: Methodologies for integrating diverse datasets into comprehensive agrohydrological models.
- Decision Support Systems: Advancements in developing decision support tools that integrate modeling and UAS information to assist farmers, water resource managers, and policymakers in optimizing agricultural water management practices.

Organizer: Sayantan Samanta, ssamanta@tamu.edu

Sponsoring Committee: NRES-21 Hydrology Group; **Co-Sponsors:**

Moderators: Sayantan Samanta, Arun Bawa

238 Advances in Irrigation Management: Deficit Irrigation and Nutrient Management

Tuesday, 2:30pm-5:00pm

Technical Community: NRES - Natural Resources & Environmental Systems

Session Type: Oral Technical Session

Description: Advances in irrigation management, particularly irrigation systems such as mobile drip, drip irrigation, center pivot irrigation, soil moisture sensing techniques, and other sensors used for irrigation management, have shown a potential to improve crop water use efficiency. Adopting these technologies is essential for optimizing water usage, reducing wastage, reducing leaching, and promoting healthier plant growth, leading to increased crop yields and enhanced agricultural productivity.

Organizer: Vasudha Sharma, vasudha@umn.edu

Sponsoring Committee: NRES-24 Irrigation; **Co-Sponsors:** NRES-244 Irrigation Management

Moderators: Vasudha Sharma

239 Extreme Event Hydrologic and Water Quality Modeling

Tuesday, 2:30pm-5:00pm

Technical Community: NRES - Natural Resources & Environmental Systems

Session Type: Oral Technical Session

Description: Extreme events induced by climate change, including heavy precipitation, wildfires, droughts, frosts, storms, and rising sea levels in coastal areas, are profound in many parts of the globe and may pose a serious threat to water quality. For example, more intense and frequent precipitation events due to climate change increase soil erosion, which may significantly degrade water quality through increased turbidity and lead to deterioration of aquatic ecosystem health. Modeling-based approaches can help scientists understand and project the impact of extreme events on water quality. This proposed session will provide new scientific knowledge that can be employed by policymakers and practitioners to ameliorate the water quality impacts of extreme events.

Organizer: Jasmeet Lamba, jsl0005@auburn.edu

Sponsoring Committee: NRES-22 Soil Erosion and Water Quality; **Co-Sponsors:** NRES-21 Hydrology Group, NRES-23 Drainage Group, NRES-26 Sustainable Land Resources

Moderators: Jasmeet Lamba

240 Innovations in Nutrient and Energy Recovery from Manure and Wastewater Systems-LIGHTNING PANEL

Tuesday, 2:30pm-5:00pm

Technical Community: NRES - Natural Resources & Environmental Systems

Session Type: Lightning Oral Technical Session

Description: Nutrient recycling in water and wastewater systems are an important part of sustainable management of watershed management, agricultural management and production systems. Novel approaches for recovery and reuse of nutrients in aquatic waste streams is essential for future sustainability in these systems.

Organizer: Mahmoud Sharara, msharar@ncsu.edu

Sponsoring Committee: NRES-27 Ag By-products & Animal Mortality Management; **Co-Sponsors:** NRES-28 Ecological Engineering

Moderators: Mahmoud Sharara, Eban Bean

241 Urban Water Challenges: From Irrigation to Water Quality Management

Tuesday, 2:30pm-5:00pm

Technical Community: NRES - Natural Resources & Environmental Systems

Session Type: Oral Technical Session

Description: Due to increased urbanization, cities have issues related to water quality, flooding, water supply, irrigation, stormwater management, and streambank erosion. This session will explore the interconnected issues of urban water resources, highlighting both conventional and innovative strategies for improving water use efficiency, reducing pollution, and mitigating environmental impacts. Discussions will encompass technological advancements and nature-based solutions that support resilient urban water systems.

Organizer: Emine Fidan, efidan@utk.edu

Sponsoring Committee: NRES-25 Streams, Reservoirs, and Wetlands Group; **Co-Sponsors:** NRES-28 Ecological Engineering, NRES-22 Soil Erosion and Water Quality, NRES-224 Sediment and Associated Pollutants, NRES-242 Surface Irrigation & Water Supply, NRES-246 Turf & Landscape Irrigation, NRES-25 Streams, Reservoirs, and Wetlands Group

Moderators: Emine Fidan, Andrea Ludwig

242 Water Resources in Circular Bioeconomy Systems-HYBRID

Tuesday, 2:30pm-5:00pm

Technical Community: NRES - Natural Resources & Environmental Systems

Session Type: Hybrid Session-submitted abstracts and guest speakers

Description: As ASABE expands research in circular bioeconomy systems, water will become an important resource and environmental consideration. The circular bioeconomy represents a system of systems in which water resources are interconnected with other components such as land management, food production and processing, and energy production. Currently, water serves as a valuable resource in production as well as a potential sink receiving nutrients or other waste streams. How will this change with proposed circular bioeconomy systems?

Organizer: Whitney Pagan, wl59680@uga.edu

Sponsoring Committee: NRES-21 Hydrology Group; **Co-Sponsors:** NRES-26 Sustainable Land Resources, CBSI-Circular Bioeconomy Systems Institute

Moderators: Whitney Pagan

PAFS - Plant, Animal, & Facility Systems

243 Mitigation of Air Pollution from Agricultural Facilities

Tuesday, 2:30pm-5:00pm

Technical Community: PAFS - Plant, Animal, & Facility Systems

Session Type: Oral Technical Session

Description: This session will include presentations from researchers, educators, and industry experts to share research experience and discuss air emission challenges and solutions in livestock and poultry production.

Organizer: Xufei Yang, xufei.yang@sdstate.edu

Sponsoring Committee: PAFS-50 Environmental Air Quality; **Co-Sponsors:**

Moderators: Xufei Yang

244 Solutions for more Sustainable Controlled Environment Agriculture Systems

Tuesday, 2:30pm-5:00pm

Technical Community: PAFS - Plant, Animal, & Facility Systems

Session Type: Oral Technical Session

Description: This session will include abstracts that focus on sustainable energy solutions tailored specifically for controlled environment agriculture.

Organizer: Jonathan Maisonneuve, maisonneuve@oakland.edu

Sponsoring Committee: PAFS-30 Plant Systems Group; **Co-Sponsors:**

Moderators: Jonathan Maisonneuve, Md Shamim Ahamed

PRS - Processing Systems

245 Drying, Handling, and Storage of Grain Crops

Tuesday, 2:30pm-5:00pm

Technical Community: PRS - Processing Systems

Session Type: Oral Technical Session

Description: Grain crops drying, processing, handling, and storage that includes measurement, development, modeling, and related research activities.

Organizer: Ma Cristine Concepcion Ignacio, cristineignacio82@gmail.com

Sponsoring Committee: PRS-702 Crop & Feed Processing & Storage; **Co-Sponsors:**

Moderators: Bethany Calixto, Marvin Petingco

246 Physical and Chemical Properties of Food, Agricultural and Biological Materials II

Tuesday, 2:30pm-5:00pm

Technical Community: PRS - Processing Systems

Session Type: Oral Technical Session

Description: Physical and chemical properties of food, agricultural and biological materials that include current and modern cutting-edge technologies in measurement.

Organizer: Deandrae Smith, smit4870@purdue.edu

Sponsoring Committee: PRS-701 Physiochemical Properties of Biological Pr; **Co-Sponsors:** PRS-03 Processing Systems Standards Oversight

Moderators: Clairmont Clementson, Emmanuel Baidhe

NRES - Natural Resources & Environmental Systems

247 NRES-Advances in Natural Resources POSTER SESSION

Tuesday, Evening (4:30-6:30)

Technical Community: NRES - Natural Resources & Environmental Systems

Session Type: Poster Technical Session

Description: NRES Poster Session.

Organizer: Jaime Thissen, jaimethissen1@gmail.com

Sponsoring Committee: NRES-04 Program Committee; **Co-Sponsors:**

Moderators: Jaime Thissen

ASE - Applied Science & Engineering

301 Sustainability in Circular and Carbon-Negative Biosystems

Wednesday, 7:30am-10:00am

Technical Community: ASE - Applied Science & Engineering

Session Type: Oral Technical Session

Description: Achieving a circular economy is critical for a sustainable future, particularly in sectors that currently produce resource-intensive products in a linear fashion, such as food and agriculture. At the same time, carbon-negative technologies that remove atmospheric CO2 must be developed and deployed rapidly in order to avoid the worst effects of climate change. Circularity and carbon removal are often assessed and discussed independently, even though they are highly intertwined. This session will explore conventional and emerging technologies and practices that synergize carbon removal within circular biosystems. A particular emphasis will be on assessing trade-offs between utilizing biomass for energy and carbon removal.

Organizer: Joe Sagues, wjsagues@ncsu.edu

Sponsoring Committee: ASE-16 Engineering for Sustainability; **Co-Sponsors:** ES-220 Bio-based Energy, Fuels and Products, CBSI-Circular Bioeconomy Systems Institute

Moderators: Joe Sagues, Lori Duncan

EOPD - Education, Outreach, & Professional Development

302 EOPD-Education, Outreach and Professional Development POSTER SESSION

Wednesday, 7:30am-10:00am

Technical Community: EOPD - Education, Outreach, & Professional Development

Session Type: Poster Technical Session

Description: Posters related to education, outreach, and professional development across ASABE topic areas.

Organizer: John Long, john.m.long@okstate.edu

Sponsoring Committee: EOPD-01 POSTER SESSION; **Co-Sponsors:** EOPD-203 Undergraduate & Graduate Instruction, EOPD-204 Engineering & Technology Accreditation, EOPD-205 Engineering Technology & Management Education, EOPD-206 Ag Technology & Mgmt Curriculum Review & Pgm Recog, EOPD-208 Extension, EOPD-412 Professional Ethics, EOPD-416 Continuing Professional Development

Moderators: John Long

ES - Energy Systems

303 Techno-Economic and Life Cycle Assessment of Biomass Conversion and Agricultural Systems

Wednesday, 7:30am-10:00am

Technical Community: ES - Energy Systems

Session Type: Oral Technical Session

Description: This session invites abstracts dealing with sustainability analysis using process modeling (techno-economic analysis) or life cycle assessment of agricultural and bioenergy systems, including the production of biofuels, energy, bio-products, bio-feedstocks. Abstracts related to LCA methodologies and assumptions affecting the results are also welcomed.

Organizer: Mi Li, mli47@utk.edu

Sponsoring Committee: ES-220 Bio-based Energy, Fuels and Products; **Co-Sponsors:**

Moderators: Deepak Kumar, Brendan Higgins

ITSC - Information Technology, Sensors & Control Systems

304 Machine Vision for Precision Animals and Field Robotics-LIGHTNING PANEL

Wednesday, 7:30am-10:00am
Technical Community: ITSC - Information Technology, Sensors & Control Systems
Session Type: Lightning Oral Technical Session
Description: Focuses on all machine vision innovation and applications in Precision Animals and Field Robotics.
Organizer: Daeun Choi, dana.choi@ufl.edu
Sponsoring Committee: ITSC-312 Machine Vision; **Co-Sponsors:**
Moderators: Magni Hussain

305 Simulation-aided Agricultural Design and Optimization-LIGHTNING PANEL

Wednesday, 7:30am-10:00am
Technical Community: ITSC - Information Technology, Sensors & Control Systems
Session Type: Lightning Oral Technical Session
Description: This session focuses on numerical simulation-based decision-making and design/ system optimization on various agricultural and biological engineering problems.
Organizer: Douglas Cook, d.cook@byu.edu
Sponsoring Committee: ITSC-217 Computational Methods, Simulations & Applications; **Co-Sponsors:**
Moderators: Douglas Cook, Darren Drewry

306 Spectroscopic Sensing and Imaging for Quality Assessment in Agricultural Commodities-LIGHTNING PANEL

Wednesday, 7:30am-10:00am
Technical Community: ITSC - Information Technology, Sensors & Control Systems
Session Type: Lightning Oral Technical Session
Description: Development and applications of spectroscopic sensing and imaging technologies for agrifood uses.
Organizer: Micah Lewis, micah.lewis@usda.gov
Sponsoring Committee: ITSC-348 Electromagnetics & Spectroscopy; **Co-Sponsors:**
Moderators: Samir Trabelsi

MS - Machinery Systems

307 AI in Field Operations and Smart Farming

Wednesday, 7:30am-10:00am
Technical Community: MS - Machinery Systems
Session Type: Oral Technical Session
Description: Artificial intelligence (AI) is finding increased use in agricultural field applications. This session highlights the use of AI in machinery systems for agricultural production and smart farming systems.
Organizer: Andres Ferreyra, andres.ferreyra@syngenta.com
Sponsoring Committee: MS-54 Precision Agriculture; **Co-Sponsors:**
Moderators: Andres Ferreyra

308 UAS Applications in Precision Agriculture, Natural Resources, and Vector Control

Wednesday, 7:30am-10:00am
Technical Community: MS - Machinery Systems
Session Type: Oral Technical Session

Description: This session highlights the breadth of novel Uncrewed Aerial Systems (aka UAS or drones), within our entire professional society.

Organizer: Daniel Martin, dan.martin@usda.gov

Sponsoring Committee: MS-60 Unmanned Aerial Systems; **Co-Sponsors:**

Moderators: Daniel Martin

NRES - Natural Resources & Environmental Systems

309 Advances in Irrigation Management: Irrigation Systems and Sensors

Wednesday, 7:30am-10:00am

Technical Community: NRES - Natural Resources & Environmental Systems

Session Type: Oral Technical Session

Description: Advances in irrigation management, particularly irrigation systems such as mobile drip, drip irrigation, center pivot irrigation, soil moisture sensing techniques, and other sensors used for irrigation management, have shown a potential to improve crop water use efficiency. Adopting these technologies is essential for optimizing water usage, reducing wastage, reducing leaching, and promoting healthier plant growth, leading to increased crop yields and enhanced agricultural productivity.

Organizer: Stacia Conger, sdavis@agcenter.lsu.edu

Sponsoring Committee: NRES-24 Irrigation; **Co-Sponsors:** NRES-244 Irrigation Management

Moderators: Stacia Conger

310 Agricultural Conservation Practices: Nutrient Control, Crop Rotation, and Soil Sustainability

Wednesday, 7:30am-10:00am

Technical Community: NRES - Natural Resources & Environmental Systems

Session Type: Oral Technical Session

Description: Globally freshwater bodies are threatened by increases in sediment and nutrient losses from agricultural fields. Significant knowledge is added regarding agricultural conservation practices for protecting the water bodies, however, continued eutrophication and hypoxia persist in the waters. This session aims to provide a platform for presentation and discussion of the latest research on agriculture conservation practices and their impact on the environment.

Organizer: Laxmi Prasad, laxmi.prasad@ndsu.edu

Sponsoring Committee: NRES-22 Soil Erosion and Water Quality; **Co-Sponsors:** NRES-23 Drainage Group

Moderators: Laxmi Prasad, Vinayak Shedekar

311 AI, Data-Driven and Remote Sensing Approaches in Irrigation Management-1

Wednesday, 7:30am-10:00am

Technical Community: NRES - Natural Resources & Environmental Systems

Session Type: Oral Technical Session

Description: The role of AI, and remote sensing is crucial in efficient irrigation management. As larger efficiency in irrigation water use is always desirable, these technologies can play a key role in developing precise management zones and strategies to achieve that. A lot of new research focuses on these technologies to predict plant water stress and it would be great to dedicate a separate session to their applications in irrigation management.

Organizer: Vivek Sharma, vsharma1@ufl.edu

Sponsoring Committee: NRES-24 Irrigation; **Co-Sponsors:** NRES-241 Sprinkler Irrigation, NRES-244 Irrigation Management

Moderators: Burdette Barker

312 Emerging Contaminants, Pathogens, and Antibiotics Resistance

Wednesday, 7:30am-10:00am

Technical Community: NRES - Natural Resources & Environmental Systems

Session Type: Oral Technical Session

Description: Emerging contaminants (i.e., personal care products, antibiotics, pesticides, PF AS, microplastics) have become ubiquitous in freshwater ecosystems due to land use practices. These contaminants have critical environmental (i.e., antibiotic resistance) and human health implications. Further, pathogens continue to be a challenge particularly in rural communities, where water infrastructure investments are often limited. Therefore, this session will include and assess detection, fate and transport, and treatment of emerging contaminants, pathogens, and antibiotics resistance in water systems.

Organizer: Emily Nottingham Byers, emilyrnottingham@gmail.com

Sponsoring Committee: NRES-25 Streams, Reservoirs, and Wetlands Group; **Co-Sponsors:** NRES-28 Ecological Engineering, NRES-22 Soil Erosion and Water Quality, NRES-224 Sediment and Associated Pollutants, NRES-242 Surface Irrigation & Water Supply, NRES-25 Streams, Reservoirs, and Wetlands Group, NRES-262 Onsite Water Reuse

Moderators: Emily Nottingham Byers, Michelle Soupir

313 Innovations in Hydrological Modeling and Water Resource Management

Wednesday, 7:30am-10:00am

Technical Community: NRES - Natural Resources & Environmental Systems

Session Type: Oral Technical Session

Description: This session will explore the current landscape and emerging trends in hydrology models, national water model initiatives, and next-generation agroecosystem models. It aims to bring together experts, researchers, and practitioners from diverse fields to discuss the latest advancements, challenges, and future directions in modeling water systems and agroecosystems.

As climate change, land use alterations, and population growth continue to challenge water resources and agricultural productivity, there is an increasing need for sophisticated models that can predict and manage the complexities of hydrological processes and agroecosystem interactions. This session will explore integrating cutting-edge technologies, such as high-resolution biophysical models, machine learning, and remote sensing, in modeling efforts. Furthermore, it will highlight the importance of collaborative initiatives, such as the National Water Model and other regional or global efforts, in enhancing our ability to simulate and manage water resources effectively.

Key themes to be addressed include:

- Hydrology Models: Status, recent advancements, and challenges in simulating hydrological processes at various scales. Models include but are not limited to not limited to APEX, DRAINMOD, DSSAT, EPIC, Ages, HSPF, MIKE, PIHM, SWAT, W AM, WaSSI, and WEPP.
- National Water Model Initiatives: Overview of ongoing national efforts to develop comprehensive water models and their implications for water resource management.
- Next-Gen Agroecosystem Models: The development of next-generation models to simulate agroecosystem dynamics, including biogeochemical cycles, GHG emissions and mitigation, crop growth, and soil-water interactions under varying climatic conditions.
- Technological Integration: The role of emerging technologies such as machine learning, remote sensing, and high-performance computing in advancing model accuracy and utility.
- Future Directions: Identifying gaps in current models, opportunities for innovation, and the potential for interdisciplinary collaboration to address complex environmental challenges.

Organizer: Sushant Mehan, sushantmehan@gmail.com

Sponsoring Committee: NRES-21 Hydrology Group; **Co-Sponsors:** NRES-21 Hydrology Group, NRES-22 Soil Erosion and Water Quality, NRES-223 Erosion Control Research, NRES-224 Sediment and Associated

Pollutants, NRES-225 Conservation Systems, NRES-25 Streams, Reservoirs, and Wetlands Group, NRES-26 Sustainable Land Resources

Moderators: Sushant Mehan, Jaehak Jeong

314 Integrating Hydrologic Models and Life Cycle Assessment: Enhancing Carbon Emission Estimation in Environmental Research-GUEST SPEAKERS

Wednesday, 7:30am-10:00am

Technical Community: NRES - Natural Resources & Environmental Systems

Session Type: Guest Speaker Session

Description: The integration of hydrologic models and life cycle assessment (LCA) is becoming increasingly important due to the growing need to estimate carbon emissions from various production processes, driven by climate change concerns. LCA and life cycle impact assessment (LCIA) are key tools for estimating carbon emissions, and they can be used to evaluate and compare best management practices within hydrological models. However, LCA and LCIA analyses are often missing from hydrologic models, and LCA studies frequently lack the data that hydrological models can provide. For instance, hydrological models can aid in estimating water footprint—such as available water in a watershed (blue water) and soil moisture (green water)—which is a common challenge in LCA. Additionally, hydrologic models can provide valuable data on biomass and N2O emissions from soil plowing and harvesting, helping to complete life cycle data inventories (LCI). This session aims to present cutting-edge research focused on coupling hydrologic models with LCA studies.

Organizer: Hadi Bazrkar, hadi.bazrkar@ag.tamu.edu

Sponsoring Committee: NRES-21 Hydrology Group; **Co-Sponsors:**

Moderators: Hadi Bazrkar

PAFS - Plant, Animal, & Facility Systems

315 Measurement and Modeling of Air Emissions from Agricultural Production Systems

Wednesday, 7:30am-10:00am

Technical Community: PAFS - Plant, Animal, & Facility Systems

Session Type: Oral Technical Session

Description: This session convenes researchers, educators, and industry experts to discuss current challenges and research updates on addressing air pollution issues in livestock and poultry facilities through measurement, mitigation, and modeling methods.

Organizer: Yang Zhao, yzhao@utk.edu

Sponsoring Committee: PAFS-50 Environmental Air Quality; **Co-Sponsors:**

Moderators: Mindy Spiehs

PRS - Processing Systems

316 Management of Food, Organic Wastes, and Byproducts for Improving Circularity I

Wednesday, 7:30am-10:00am

Technical Community: PRS - Processing Systems

Session Type: Oral Technical Session

Description: Organic wastes and byproducts may cause environmental damage or economic loss without careful management and treatment. Further, many of these materials have unexploited value. This session will focus on engineering solutions for waste and byproduct streams from agriculture, food, municipal, and bioenergy operations.

Organizer: Toufiq Reza, treza@fit.edu

Sponsoring Committee: PRS-707 Food & Organic Waste Management & Utilization; **Co-Sponsors:** CBSI-Circular Bioeconomy Systems Institute

Moderators: Deandrae Smith, Toufiq Reza

317 PRS-Processing Systems POSTER SESSION

Wednesday, 7:30am-10:00am

Technical Community: PRS - Processing Systems

Session Type: Poster Technical Session

Description: This poster session includes all topics related to the processing systems technical community. The processing systems community has the following sub-communities such as physiochemical properties of biological products, crop and feed processing and storage, food processing, bioconversion and bioprocesses, food and organic waste management and utilization. Poster sessions allow one-to-one interaction between the presenter and the audience.

Organizer: Janie McClurkin Moore, Janie.Moore@ag.tamu.edu

Sponsoring Committee: PRS-01 POSTER SESSION; **Co-Sponsors:**

Moderators: Janie McClurkin Moore

ASE - Applied Science & Engineering

318 ASE-Applied Science and Engineering POSTER SESSION

Wednesday, 10:15am-12:15pm

Technical Community: ASE - Applied Science & Engineering

Session Type: Poster Technical Session

Description: Posters related to forest engineering, sustainability, and other applied science and engineering topics not fitting within other communities.

Organizer: Catherine Brewer, cbrewer@nmsu.edu

Sponsoring Committee: ASE-01 POSTER SESSION; **Co-Sponsors:**

Moderators: Catherine Brewer, Lori Duncan

CBS - Circular Bioeconomy Systems

319 CBSI-Circular Bioeconomy Systems Research, Education, and Outreach-POSTER SESSION

Wednesday, 10:15am-12:15pm

Technical Community: CBS - Circular Bioeconomy Systems

Session Type: Poster Technical Session

Description: This poster session facilitates information sharing and networking related to circular bioeconomy systems (CBS). It is organized into three focus areas: research, education, and outreach. Research topics could be related to constituent systems of production, processing, packaging, and supply of bioproducts, entire value chains, and waste recovery and use, including examples that describe work completed or analyses of proposed systems that would increase circularity relative to existing systems. Education topics could include curricular innovations that embed sustainability and bioeconomy concepts into engineering programs. Share your experiences, methods, and outcomes in preparing students to excel in a sustainable, bio-based future. Outreach topics could include programming designed to advance CBS concepts and technologies among producers and industry.

Organizer: Alicia Modenbach, alicia.modenbach@uky.edu

Sponsoring Committee: CBSI; **Co-Sponsors:** ASE-16 Engineering for Sustainability, EOPD-203 Undergraduate & Graduate Instruction, EOPD-205 Engineering Technology & Management Education, EOPD-208 Extension

Moderators: Alicia Modenbach, Ed Barnes

ES - Energy Systems

320 Anaerobic Digestion for Clean Power and Co-products Production

Wednesday, 10:15am-12:15pm

Technical Community: ES - Energy Systems

Session Type: Oral Technical Session

Description: Join us to explore the multifaceted benefits of anaerobic digestion technology in advancing sustainable energy solutions. Presenters will also delve into how anaerobic digestion can effectively convert organic waste into clean, renewable power while simultaneously generating valuable co-products such as biofertilizers and biogas.

Organizer: Jaime Thissen, jaimethissen1@gmail.com

Sponsoring Committee: ES-210 Renewable Power Generation Committee; **Co-Sponsors:**

Moderators: Jaime Thissen, Fei Yu

321 Biomass Feedstock Supply System and Biorefinery

Wednesday, 10:15am-12:15pm

Technical Community: ES - Energy Systems

Session Type: Oral Technical Session

Description: 'Biomass Feedstock Supply System and Biorefinery' session includes research related to all the unit operations required to harvest, collect, and move the biomass from the field or forest to the biorefinery, and biorefinery conversion process.

Organizer: Mi Li, mli47@utk.edu

Sponsoring Committee: ES-220 Bio-based Energy, Fuels and Products; **Co-Sponsors:**

Moderators: Jaya Shankar Tumuluru, Ashish Manandhar

ITSC - Information Technology, Sensors & Control Systems

322 Imaging Technologies for High Throughput Phenotyping-LIGHTNING PANEL

Wednesday, 10:15am-12:15pm

Technical Community: ITSC - Information Technology, Sensors & Control Systems

Session Type: Lightning Oral Technical Session

Description: Focuses on recent innovations in imaging systems and approaches for high throughput phenotyping for crops and animal production systems.

Organizer: Shih-Fang Chen, sfchen@ntu.edu.tw

Sponsoring Committee: ITSC-312 Machine Vision; **Co-Sponsors:**

Moderators: Hsiao-Mei Wu, Shih-Fang Chen

323 Unmanned Ground and Aerial Robots for Agricultural Applications-LIGHTNING PANEL

Wednesday, 10:15am-12:15pm

Technical Community: ITSC - Information Technology, Sensors & Control Systems

Session Type: Lightning Oral Technical Session

Description: Focus on unmanned ground and aerial robots applications in agriculture, especially the collaboration and coordination of multiple UAVs and UGVs.

Organizer: Hasan Seyyedhasani, seyyedhasani12@vt.edu

Sponsoring Committee: ITSC-254 Emerging Information Systems; **Co-Sponsors:**

Moderators: Hasan Seyyedhasani, Magni Hussain

MS - Machinery Systems

324 Machine Electrification and Automation-GUEST SPEAKERS

Wednesday, 10:15am-12:15pm

Technical Community: MS - Machinery Systems

Session Type: Guest Speaker Session

Description: Speakers will present recent developments in the area of electrically-powered machinery and related applications of automated functionality.

Organizer: Robert Waggoner, robert.waggoner@agcocorp.com

Sponsoring Committee: MS-01 POSTER SESSION; **Co-Sponsors:**

Moderators: Robert Waggoner

325 Machinery Systems and Task Optimization Through System Analysis

Wednesday, 10:15am-12:15pm

Technical Community: MS - Machinery Systems

Session Type: Oral Technical Session

Description: This session will be about the collection of data and its analysis while considering a machine or system. This data collection and analysis can be for a component, machine, or machine process.

Organizer: Ed Brokesh, ebrokesh@ksu.edu

Sponsoring Committee: MS-49 Crop Production Systems, Machinery, and Logistics; **Co-Sponsors:**

Moderators: Jason Werning

NRES - Natural Resources & Environmental Systems

326 Advancing Climate-Resilient Agroecosystems and Nutrient Management Strategies

Wednesday, 10:15am-12:15pm

Technical Community: NRES - Natural Resources & Environmental Systems

Session Type: Oral Technical Session

Description: This session will explore the current landscape and emerging trends in hydrology models, national water model initiatives, and next-generation agroecosystem models. It aims to bring together experts, researchers, and practitioners from diverse fields to discuss the latest advancements, challenges, and future directions in modeling water systems and agroecosystems.

As climate change, land use alterations, and population growth continue to challenge water resources and agricultural productivity, there is an increasing need for sophisticated models that can predict and manage the complexities of hydrological processes and agroecosystem interactions. This session will explore integrating cutting-edge technologies, such as high-resolution biophysical models, machine learning, and remote sensing, in modeling efforts. Furthermore, it will highlight the importance of collaborative initiatives, such as the National Water Model and other regional or global efforts, in enhancing our ability to simulate and manage water resources effectively.

Key themes to be addressed include:

- Hydrology Models: Status, recent advancements, and challenges in simulating hydrological processes at various scales. Models include but are not limited to not limited to APEX, DRAINMOD, DSSAT, EPIC, Ages, HSPF, MIKE, PIHM, SWAT, W AM, WaSSI, and WEPP.
- National Water Model Initiatives: Overview of ongoing national efforts to develop comprehensive water models and their implications for water resource management.
- Next-Gen Agroecosystem Models: The development of next-generation models to simulate agroecosystem dynamics, including biogeochemical cycles, GHG emissions and mitigation, crop growth, and soil-water interactions under varying climatic conditions.
- Technological Integration: The role of emerging technologies such as machine learning, remote sensing, and high-performance computing in advancing model accuracy and utility.
- Future Directions: Identifying gaps in current models, opportunities for innovation, and the potential for interdisciplinary collaboration to address complex environmental challenges.

Organizer: Sushant Mehan, sushantmehan@gmail.com

Sponsoring Committee: NRES-21 Hydrology Group; **Co-Sponsors:** NRES-21 Hydrology Group, NRES-22 Soil Erosion and Water Quality, NRES-223 Erosion Control Research, NRES-224 Sediment and Associated Pollutants, NRES-225 Conservation Systems, NRES-25 Streams, Reservoirs, and Wetlands Group, NRES-26 Sustainable Land Resources

Moderators: Sushant Mehan, Jaehak Jeong

327 Agricultural Conservation Practices: Sediment and Nutrient Loss Reduction

Wednesday, 10:15am-12:15pm

Technical Community: NRES - Natural Resources & Environmental Systems

Session Type: Oral Technical Session

Description: Globally freshwater bodies are threatened by increases in sediment and nutrient losses from agricultural fields. Significant knowledge is added regarding agricultural conservation practices for protecting the water bodies, however, continued eutrophication and hypoxia persist in the waters. This session aims to provide a platform for presentation and discussion of the latest research on agriculture conservation practices and their impact on the environment.

Organizer: Laxmi Prasad, laxmi.prasad@ndsu.edu

Sponsoring Committee: NRES-22 Soil Erosion and Water Quality; **Co-Sponsors:** NRES-23 Drainage Group

Moderators: Laxmi Prasad, Vinayak Shedekar

328 AI, Data-Driven and Remote Sensing Approaches in Irrigation Management-2

Wednesday, 10:15am-12:15pm

Technical Community: NRES - Natural Resources & Environmental Systems

Session Type: Oral Technical Session

Description: The role of AI, and remote sensing is crucial in efficient irrigation management. As larger efficiency in irrigation water use is always desirable, these technologies can play a key role in developing precise management zones and strategies to achieve that. A lot of new research focuses on these technologies to predict plant water stress and it would be great to dedicate a separate session to their applications in irrigation management.

Organizer: Vivek Sharma, vsharma1@ufl.edu

Sponsoring Committee: NRES-24 Irrigation; **Co-Sponsors:** NRES-241 Sprinkler Irrigation, NRES-244 Irrigation Management

Moderators: Burdette Barker

329 Conservation Drainage Practices – Current and Future Innovations

Wednesday, 10:15am-12:15pm

Technical Community: NRES - Natural Resources & Environmental Systems

Session Type: Oral Technical Session

Description: Surface and subsurface drainage is crucial for the sustenance and profitability of agroecosystems in humid and arid climates. The shifting agro-climatic zones and expanding soil degradation issues have posed newer water management challenges for the conventional drainage infrastructure. Furthermore, by being a major hydrologic pathway of water in intensively drainage landscapes, agricultural drainage plays a major role in the transport of nutrients, sediment, and other pollutants to downstream water bodies. Within field, edge-of-field, and stream-level conservation drainage practices have emerged for solving the water management and environmental quality issues. This session invites submissions focused on current and future innovations in conservation drainage practices. Authors are encouraged to submit presentations based on (but not limited to) the following topics:

- Innovative conservation drainage approaches to address water quality issues at field-to-watershed scales (examples include controlled drainage, drainage water recycling, saturated buffers, woodchip bioreactors, phosphorus removal structures, two-stage ditch design etc.).
- Stacking of conservation practices to enhance efficacy, environmental impact, and/or economic feasibility.
- Case studies showing unique application of conservation drainage practices to address specific local/regional issues (e.g. practices for addressing legacy phosphorus losses).
- Model applications and/or improvements focused on conservation drainage practices assessment.

Organizer: Chandra Madramootoo, chandra.madramootoo@McGill.Ca

Sponsoring Committee: NRES-23 Drainage Group; **Co-Sponsors:** NRES-21 Hydrology Group, NRES-225 Conservation Systems, NRES-25 Streams, Reservoirs, and Wetlands Group, NRES-262 Onsite Water Reuse, NRES-28 Ecological Engineering

Moderators: Chandra Madramootoo, Ella Nichols

330 Ecological Engineering and Harmful Algal Blooms

Wednesday, 10:15am-12:15pm

Technical Community: NRES - Natural Resources & Environmental Systems

Session Type: Oral Technical Session

Description: Harmful algal blooms (HABs) are on the rise in reservoirs, estuaries, and rivers. These blooms affect ecological systems and human health. They are an important topic of research, and many state and federal agencies are funding this research.

Organizer: Jay Martin, martin.1130@osu.edu

Sponsoring Committee: NRES-28 Ecological Engineering; **Co-Sponsors:** NRES-21 Hydrology Group, PRS-280 Bioconversion and Bioprocesses, ES-220 Bio-based Energy, Fuels and Products

Moderators: Anna Linhoss

331 Modeling Ecosystem Evapotranspiration in Multiple Land Uses and Scales-HYBRID

Wednesday, 10:15am-12:15pm

Technical Community: NRES - Natural Resources & Environmental Systems

Session Type: Hybrid Session-submitted abstracts and guest speakers

Description: Ecosystem evapotranspiration (ET) is a major component of the hydrologic budget, which also regulates runoff, soil water storage, groundwater recharge, biogeochemical cycles, environmental flows, biodiversity, and the global climate system. However, quantifying ET and its components for varying land uses remains challenging because of the complexity in its drivers and feedbacks at multiple scales. Modeling tools have been developed in the past decades for quantifying ET to improve various hydrological research and applications. A review of current ecohydrologic models identified several knowledge gaps. For example, methods for accurately partitioning ET into soil-water or litter/understory evaporation and transpiration are lacking for forest ecosystems. Due to the challenges of measuring components of ecosystem ET directly, the accuracy of ET separation methods has not been well validated, and limited model evaluation efforts have been made. Due to model structure deficiencies that lack specific information on crop and/or vegetation data such as leaf area index, stomatal conductance, rooting depth, and soil moisture, or input limitations, current ET routines in ecohydrologic models may not be sufficient for reliably quantifying all ET components. Given the advancement in high-resolution spatial and temporal data such as SMAP-HYDRO for high resolution soil moisture data, and remotely sensed ET products like MODIS ET, Open-ET, ECOSTRESS, and ground-based networks such as AmeriFlux, there are promising opportunities for these models to capitalize on. These advancements could help improve and/or enhance the parameterization and simulation processes of ET, including its partitioned components, and will be critical for developing effective management strategies to cope with emerging water resource and related challenges.

We specifically invite abstracts to this session focused on, but not limited to, above topics including application/ limitation of eddy covariance measurements, advancements in reference ET methods, partitioning ET using isotopic signatures, and advancing the current understanding of various processes and their feedback. All of these factors ultimately affect the model validation and prediction uncertainties in water management, yield and budget.

Organizer: Devendra Amatya, devendra.m.amatya@usda.gov

Sponsoring Committee: NRES-21 Hydrology Group; **Co-Sponsors:** NRES-22 Soil Erosion and Water Quality, NRES-23 Drainage Group, NRES-25 Streams, Reservoirs, and Wetlands Group

Moderators: Devendra Amatya, Meetpal Kaul

332 Winter Hydrology and Water Quality Challenges in the Great Lakes Region

Wednesday, 10:15am-12:15pm

Technical Community: NRES - Natural Resources & Environmental Systems

Session Type: Oral Technical Session

Description: The United States and Canada have formally committed to reducing nutrient loadings into the Great Lakes through the Great Lakes Water Quality Agreement (GLWQA). This agreement aims to restore and protect the Great Lakes by tackling the increasing problems of eutrophication and water quality impairment.

The proposed session invites presentations on recent research, outreach, and policy efforts focused on:

- Assessing management practices for reducing agricultural pollution and controlling erosion.
- Addressing legacy pollutants, including phosphorus and nitrogen.

• Monitoring and assessing current state of pollution caused by nutrients, sediments, and other toxic chemicals (including pesticides, heavy metals, PCBs, etc.).

• Identifying and mitigating emerging contaminants not removed by conventional wastewater treatment.

• Developing and applying field-to-watershed scale models for predicting and managing water quality.

• Evaluating the impacts of climate change on effectiveness of management practices.

• Emerging data sources, use, and limitations to address water quality issues.

• Examining the effectiveness of existing regulatory frameworks and policy measures in addressing water quality issues.

The goal of this session is to discuss science-based findings and current efforts to improve water quality across the Great Lakes region, from field-to-watershed-to-regional scales.

Organizer: Asmita Murumkar, murumkar.1@osu.edu

Sponsoring Committee: NRES-21 Hydrology Group; **Co-Sponsors:** NRES-22 Soil Erosion and Water Quality, NRES-23 Drainage Group, NRES-26 Sustainable Land Resources

Moderators: Asmita Murumkar, Femeena Valappil

PAFS - Plant, Animal, & Facility Systems

333 R.S. Gates Memorial Lecture Series

Wednesday, 10:15am-12:15pm

Technical Community: PAFS - Plant, Animal, & Facility Systems

Session Type: Guest Speaker Session

Description: Throughout his distinguished 40-year career as an agricultural engineer, Richard S. Gates, PhD, PE, ASABE Fellow, and recipient of the Henry Giese Structures and Environment Award, made an indelible impact. His pioneering work and innovative contributions significantly advanced plant and animal production systems engineering, leaving a profound legacy within the PAFS community. This memorial session honors Dr. Gates' life, career, and service by celebrating the contributions of others who continue to innovate and advance our profession.

Organizer: Yijie Xiong, yijie.xiong@unl.edu

Sponsoring Committee: PAFS-40 Facilities & Systems Group; **Co-Sponsors:** PAFS-20 Structures Group, PAFS-30 Plant Systems Group, PAFS-40 Facilities & Systems Group, PAFS-50 Environmental Air Quality

Moderators: Yijie Xiong, Hanwook Chung

PRS - Processing Systems

334 Biochemical Conversion and Bioprocess Modeling

Wednesday, 10:15am-12:15pm

Technical Community: PRS - Processing Systems

Session Type: Oral Technical Session

Description: This session will be focused on bioprocessing and bioconversion of biomass into biofuel, biochemical, and biomaterials, as well as covering research on the modeling of the bioconversion processes.

Organizer: Ashish Manandhar, manandhar.5@osu.edu

Sponsoring Committee: PRS-280 Bioconversion and Bioprocesses; **Co-Sponsors:**

Moderators: Hasan Atiyeh, Yi Wang

335 Management of Food, Organic Wastes, and Byproducts for Improving Circularity II

Wednesday, 10:15am-12:15pm

Technical Community: PRS - Processing Systems

Session Type: Oral Technical Session

Description: Organic wastes and byproducts may cause environmental damage or economic loss without careful management and treatment. Further, many of these materials have unexploited value. This session will focus

on engineering solutions for waste and byproduct streams from agriculture, food, municipal, and bioenergy operations.

Organizer: Toufiq Reza, treza@fit.edu

Sponsoring Committee: PRS-707 Food & Organic Waste Management & Utilization; **Co-Sponsors:** CBSI-Circular Bioeconomy Systems Institute

Moderators: Deandrae Smith, Toufiq Reza