

FIRST ANNUAL CONFERENCE



MIDWEST BIOSOLIDS ASSOCIATION PROGRAM

Tuesday, March 26, 2024

Beck Center - Purdue University

4550 US-52, West Lafayette, IN

<https://mwbiosolids.org/>

Conference chair

John W. Norton Jr., PhD, PE

Great Lakes Water Authority

john.norton@glwater.org

Conference local host

Professor Linda Lee, PhD

Purdue University

lslee@purdue.edu

MIDWEST BIOSOLIDS ASSOCIATION

241 N. 5th Street

Springfield, IL 62701

PRESIDENT'S MESSAGE

President,
Midwest Biosolids Association
Dr. Albert Cox
MWRD Greater Chicago



On behalf of our Board of Directors, I welcome you to the First Annual Conference of the Midwest Biosolids Association (MBA). I extend heartfelt appreciation to each of you for joining us at this inaugural conference. Your participation in this event is enormously valuable, and I am thrilled about the information and the experience you will gain from this one day, concentrated with presentations, networking, and other interactions.

I want to acknowledge and commend the dedicated efforts of all who contributed to make this conference a reality. I extend appreciation to our organizers, with special recognition to Conference Chair, Dr. John Norton Jr., and the staff of KBIII Group, Purdue University and Great Lakes Water Authority. Additionally, I express gratitude to our gracious host, Purdue University, the generosity of the conference sponsors, the contribution of conference speakers, and exhibitors who will share information on products and services that serves our industry. I also appreciate the Water Research Foundation and United States Environmental Protection Agency for accommodating this MBA conference at this venue, smack in between their individual biosolids research workshops. This is a bonus to those who will be participating in all three events.

Navigating the first year of the MBA has been a learning but rewarding experience for me and probably also for members of our Board of Directors, and others who serve the association through participation on committees and otherwise. Most of our activities during this first year were dominated by our efforts to understand and to minimize the impacts of the issue of PFAS on the future of sustainable biosolids management. The MBA continues to serve as the voice to support sensible policies affecting biosolids in the region.

Embarking on our first annual conference within a year of forming the association was indeed a challenging undertaking. However, because of the value of the information and experience envisioned from the conference, working through these challenges was worthwhile. The carefully crafted agenda provides a platform to delve into the shared experiences and challenges we face in managing biosolids cost-effectively and sensibly. Furthermore, it offers a glimpse into the cutting-edge research that will guide us in overcoming these challenges. However, the value of this awesome program hinges on our engagement and participation. I encourage each of you to take advantage of this opportunity for learning, networking, and, foremost, making this an enjoyable experience. Let's make this inaugural conference a fruitful and memorable experience to fuel our commitment and efforts to support sensible approaches to managing biosolids in the Midwest. Lastly, we hope this conference amplifies your enthusiasm to become more engaged in charting the future of MBA and to spread the word to those who are yet to become members.

Thank you, and I look forward to the awesome and enriching interactions during the conference.

- *Albert Cox*

CONFERENCE CHAIR

Conference Chair
Midwest Biosolids Association
John Norton, Jr., PhD, PE
Great Lakes Water Authority



Dear Midwest biosolids association friends and family,

I am delighted to present to you the first annual conference of the Midwest Biosolids Association.

The purpose of this conference is to network and share current and emerging efforts to improve the water sector's handling of wastewater biosolids and water treatment plant residuals.

This conference has four main themes:

1. Organizational and water sector activities
2. Utility focused efforts, projects, and programs
3. Research efforts.
4. Consultant-facilitated state of the art practice

As conference chair, I would like to acknowledge my collaborators Albert Cox, Stacia Eckenwiler, Linda Lee, Persephone Ma, Lola Olabode, and many others in helping to organize and structure this conference.

I would also like to provide a tremendous thank you and acknowledgement of the conference local host, Professor Linda Lee, researcher, mentor, teacher extraordinaire. Prof. Lee is one of the worlds leading soil scientists and biosolids researchers. One of her PhD students, Hui Li, Professor at Michigan State University, is here today as leaders in his own right. This conference could not have occurred without her leadership and vision.

I hope we have set the bar high for subsequent conferences. Let's continue to grow this field so as to continue to grow the fields.

- John Norton

LOCAL HOST

Local Host
Dr. Linda S. Lee, Distiguished Professor
Department of Agronomy,
Purdue University



Welcome to Purdue! Thank you for allowing me the pleasure of hosting the First Annual Conference of the Midwest Biosolids Association (MBA). I am thrilled to see how well the MBA has launched! I look forward to all the learning and sharing that will happen today. May our pooled contributions and interactions enhance our trajectory towards sustainable biosolids management, which benefits our farmers and enhances the economic viability of providing sufficient food and clean water. Thank you all for coming and special thanks to all who contributed to making today special!

- Linda S. Lee

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AGENDA

Midwest Biosolids Association
First Annual Conference
March 26, 2024
Beck Center - Purdue University

SESSION 1:

COLLABORATION FOR SUSTAINABLE BIOSOLIDS MANAGEMENT

- | | |
|-------------|--|
| 8:00 AM | Welcome to the Conference |
| 8:05 AM | Formation of the Midwest Biosolids Association |
| 8:15 AM | Reflections on the Pretreatment Program for Biosolids Quality Improvements |
| 8:35 AM | Working Together for Win-Win Land Application Contracts |
| 8:55 AM | Outreach Committee on MBA Member Engagement Survey |
| 9:15 AM | Musings from a Biosolids Network Playbook |
| 9:35 - 9:50 | Networking Break |

SESSION 2:

LESSONS FROM PEEL UTILITIES WHAT IS EVERYONE ELSE DOING?

- | | |
|----------|---|
| 9:50 AM | Introduction of utility projects and programs |
| 9:55 AM | State of the Solids: The City of Columbus's 100% Beneficial Reuse Program |
| 10:15 AM | GLWA's biosolids research program: failures and successes |
| 10:35 AM | Direct and indirect benefits of biosolids applications,
including financial and soil health benefits |
| 10:55 AM | Sampling for PFAS compounds |
| 11:15 AM | PRACTITIONER ROUNDTABLE
Addressing stakeholder challenges and interests |
| 11:45 AM | Lunch |

SESSION 3: PRACTICE - INFORMED RESEARCH

- 12:30 PM Introduction of biosolids research efforts
- 12:35 PM WRF 5170: State of the Science and Regulatory Acceptability for PFAS Residual Management Options
- 12:55 PM WRF 5169: Evaluating Innovative and Sustainable Treatment Options for Biosolids
- 1:15 PM Unregulated Organic Chemicals in Biosolids: Prioritization, Fate, and Risk Evaluation for Land Applications (EPA Grant 84024501)
- 1:35 PM PFAS in pre-stabilized sludge and Biosolids for 27 WRRF
- 1:55 PM Using residuals to improve urban soil health
- 2:15 PM US EPA project: Accessing Biosolids Treatment Processes on Pollutant Environmental Fate and Plant Uptake following Land Application
- 2:35 - 2:50 PM Networking Break

SESSION 4: CASE STUDIES - WHAT CAN BE LEARNED

- 2:50 PM Introduction to the consulting world
- 2:55 PM Beyond Class A cake: A Phased Master Plan of Post processing Upgrades to Enhance Biosolids Program Resiliency and Manage Risk.
- 3:15 PM How Columbus performed the first multi-sensor fugitive methane study in the Western Hemisphere
- 3:35 PM Biosolids Management Decisions Considering Climate Change and Future Pollutants
- 3:55 PM Anaerobic Digestion of Organics: Overview of Two Case Studies for RNG and CHP Resource Recovery
- 4:15 - 5:00 PM **INDUSTRY ROUNDTABLE**
New and emerging biosolids handling technologies

CONFERENCE SPEAKERS (in order of presentation)

- John Norton Jr., PhD, PE,** Director of Energy, Research, and Innovation
Great Lakes Water Authority, Detroit, Michigan
- Dr. Albert Cox,** President of Midwest Biosolids Association
Environmental Monitoring and Research Manager
MWRDGC, Chicago, Illinois
- Stephen Kuplicki, PE, JD,** Manager, Industrial Waste Control
Great Lakes Water Authority, Detroit, Michigan
- Eric Dresbach,** WD Farms, Circleville, Ohio
- Persephone Ma, PhD,** Environmental Engineer, Brown and Caldwell
- Elizabeth Charbonnet, PE,** Senior Engineer, Carollo
- Maile Lono-Batura, BCES,** Director, Sustainable Biosolids Programs
Water Environment Federation,
Alexandria, Virginia
- Stacia Eckenwiler, PE,** Assistant Administrator,
City of Columbus, Ohio
- Josh Lutz,** Wastewater Residuals Manager, Columbus, Ohio
- Tyler Schweinfurth,** Project Manager, Division of Sewerage and Drainage
Columbus, Ohio
- Paul Wilken,** Supervisor of Conveyance and Biosolids, Western Lake
Superior Sanitary District, Minnesota
- Eric Redman,** Corporate Director of Technical Services, Eurofins
- Greg Firrantello,** Agronomist/CCA, Stewart Spreading
- Dr. Linda Lee,** Purdue University Distinguished Professor
Department of Agronomy, Purdue University
- Mahsa Modiri, PhD, PE,** Senior Engineer, EA Engineering, Science, and
Technology, Inc, PBC
- Derya Dursun Balci, PhD, PE,** Senior Associate, Hazen and Sawyer
- Lola Olabode,** Research Program Manager, Water Research Foundation
- Shubha Oza, PhD,** Senior Research Engineer, Brown and Caldwell
- Nick Basta, PhD,** Professor, Ohio State University
- Hui Li, PhD,** Professor, Michigan State University
- Dr. Kati Bell,** Director of Research and Innovation, Brown and Caldwell
- Stephanie Spalding, PE,** East Region Biosolids Lead, HDR
- Dante Fiorino,** Principal Engineer, Brown and Caldwell
- Mo Abu-Orf, PhD,** Residuals Group Practice Leader, Hazen and Sawyer
- Dustin L. Craig, PE.,** Environmental Engineer, CDM Smith, o

**- SESSION 1 -
COLLABORATIONS FOR SUSTAINABLE BIOSOLIDS
MANAGEMENT**

8:00 AM

WELCOME TO THE CONFERENCE

John Norton Jr., PhD, PE, Director of Energy, Research, and Innovation Great Lakes Water Authority, Detroit, Michigan

John kicks off the conference, briefly outlines the sessions, and then introduces Dr. Albert Cox, President of Midwest Biosolids Association.

8:05 AM

**FORMATION OF THE MIDWEST BIOSOLIDS
ASSOCIATION**

Dr. Albert Cox, President of the Midwest Biosolids Association
Environmental Monitoring and Research
Manager MWRDGC, Chicago, Illinois

Dr. Cox shares highlights of the impetus and key actions in forming Midwest Biosolids Association.

8:15 AM

**REFLECTIONS ON THE PRETREATMENT FOR
BIOSOLIDS QUALITY IMPROVEMENTS**

Stephen Kuplicki, PE, JD, Manager, Industrial Waste Control
Great Lakes Water Authority,
Detroit, Michigan

Discussion on how the Pretreatment Program has and can be used for improving “recycle and reclaim” opportunities for Biosolids. Topic includes a brief review of the traditional Pretreatment Program and its objectives, as well as examples of past program successes and future opportunities with Source Control, for improving Biosolids quality.

8:35 AM

**WORKING TOGETHER FOR WIN-WIN
LAND APPLICATION CONTRACTS**

Eric Dresbach, WD Farms, Circleville, Ohio

Based on his 30 plus years of experience, Eric will share tips, tricks, and thought process on how municipalities can write a contract for successful land application of residuals to maximize benefits to the municipality, contractor, and crop farmer.

8:55 AM

**OUTREACH COMMITTEE ON MBA MEMBER
ENGAGEMENT SURVEY**

Persephone Ma, PhD, Environmental Engineer
Brown and Caldwell

Elizabeth Charbonnet, PE, Senior Engineer, Carollo

MBA Communications and Outreach Committee will share results and takeaways from the member engagement survey.

9:15 AM

MUSINGS FROM A BIOSOLIDS NETWORK PLAYBOOK

Malle Lono-Batura, BCES, Director, Sustainable Biosolids
Programs Water Environment
Federation, Alexandria, Virginia

Maile will share reflections of leading the first regional biosolids organization for two decades to elevating the role of biosolids in her role at the Water Environment Federation.

9:35 - 9:50 AM

NETWORKING BREAK

Sponsored by:

Hazen

SESSION 2

LESSONS FROM PEER UTILITIES WHAT'S EVERYONE ELSE DOING?

9:50 AM

INTRODUCTION OF UTILITY PROJECTS AND PROGRAMS

Stacia Eckenwiler, PE, Assistant Administrator,
City of Columbus, Ohio

Welcome to the utility session

9:55 AM

STATE OF THE SOLIDS: THE CITY OF COLUMBUS'S 100% BENEFICIAL REUSE PROGRAM

Josh Lutz, Wastewater Residuals Manager, Columbus, Ohio
Tyler Schweinfurth, Project Manager, Division of Sewerage
and Drainage Columbus, Ohio

The City of Columbus has achieved 100% beneficial reuse of its biosolids since April 2016 through a diverse outlet portfolio and region-specific biosolids management strategies. These core outlets include liquid land application, cake application for mine reclamation, off-site digestion, and the City-owned and operated Class A Biosolids Composting Facility. Learn about the management successes and challenges of these various outlets with an eye toward future growth.

10:15 AM

**GLWA's BIOSOLIDS RESEARCH PROGRAM:
FAILURES AND SUCCESSES**

John Norton Jr., PhD, PE, Director of Energy, Research, and Innovation Great Lakes Water Authority, Detroit, Michigan

Dr. Norton outlines the GLWA biosolids research program and the various collaborations helping drive it forward, ranging from the Water Research Foundation, the (fairly) recent \$1.5 million hydrothermal liquefaction project funded by the Department of Energy, and brief description of the project collaboration regarding the US EPA's pollutant in biosolids program.

10:35 AM

**DIRECT AND INDIRECT BENEFITS OF BIOSOLIDS
APPLICATIONS, INCLUDING FINANCIAL AND
SOIL HEALTH BENEFITS**

Paul Wilken, Supervisor of Conveyance and Biosolids, Western Lake Superior Sanitary District, Minnesota

Information on biosolids adding organic matter to soils, water retention, and microbe health improvements in soils that have applied biosolids.

10:55 AM

SAMPLING FOR PFAS COMPOUNDS

Eric Redman, Corporate Director of Technical Services, Eurofins

Utilities and other stakeholders are in the early stages of navigating the new road to monitoring for PFAS. This session describes the trials and tribulations of PFAS sampling and measurement for water and wastewater utilities.

11:15 AM

**PRACTITIONER ROUNDTABLE
ADDRESSING STAKEHOLDER CHALLENGES
AND INTERESTS**

Paul Wilken, Supervisor of Conveyance and Biosolids,
Western Lake Superior Sanitary District,
Minnesota

Greg Firrantello, Agronomist/CCA, Stewart Spreading
Al Cox, PhD, Environmental Monitoring and Research
Manager MWRDGC

The discussion will start around addressing stakeholder questions and concerns, from the benign to the antagonistic. As soon as this is solved, the Q&A will open up to the audience for participation.

11:45 AM

LUNCH

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Lunch Speaker:

Dr. Kati Bell, Director of Research and Innovation,
Brown and Caldwell

**SESSION 3
PRACTICE - INFORMED RESEARCH**

12:30 PM

INTRODUCTION OF BIOSOLIDS RESEARCH EFFORTS

Dr. Linda Lee, Purdue University Distinguished Professor
Department of Agronomy, Purdue

Welcome to the research session

12:35 PM

**WRF 5170:
STATE OF THE SCIENCE AND REGULATORY
ACCEPTABILITY FOR PFAS RESIDUAL
MANAGEMENT OPTIONS**

Mahsa Modiri, PhD, PE, Senior Engineer, EA Engineering,
Science and Technology, Inc, PBC

The overall goal of this study is to: (1) identify currently available per- and polyfluoroalkyl substances (PFAS) residual management options and evaluate their suitability; (2) provide an overview of PFAS residual management guidelines and regulations; (3) convene a workshop with federal and state regulators and utilities to validate regulatory acceptability and limitations of various management approaches, and (4) develop a tool to help utilities evaluate PFAS residual management options.

12:55 PM

**WRF 5169: EVALUATING INNOVATIVE AND
SUSTAINABLE TREATMENT OPTIONS FOR BIOSOLIDS**

Derya Dursun Balci, PhD, PE, Senior Associate, Hazen and
Sawyer, San Diego, California

In response to the rising challenges in biosolids management, a plethora of innovative biosolids management alternatives have been emerging, providing utilities new perspectives of biosolids treatment, end-use, and a pathway to achieve circular water economy via beneficial co-product(s) generation, emission, and cost reduction. This talk will focus on a holistic evaluation framework that is developed and applied on identified innovative biosolids management alternatives.

1:15 PM

**UNREGULATED ORGANIC CHEMICALS IN BIOSOLIDS:
PRIORITIZATION, FATE, AND RISK EVALUATION FOR
LAND APPLICATIONS (EPA GRANT 84024501)**

Dr. Linda Lee, Purdue University Distinguished Professor
Department of Agronomy, Purdue

Lola Olabode, Research Program Manager,
Water Research Foundation

As part of the USEPA's "Evaluation of Pollutants in Biosolids" studies, this project is one of four projects supported by this grant. Dr. Lee will present a review of Prioritization, Fate and Risk Evaluation for Land Applications.

1:35 PM

PFAS IN PRE-STABILIZED SLUDGE AND BIOSOLIDS FOR 27 WRRF

Shubha Oza, PhD, Senior Research Engineer,
Brown and Caldwell

This project is another of four projects supported by the USEPA's "Evaluation of Pollutants in Biosolids" grant. Michigan State University, in collaboration with Colorado State University, University of Georgia Research Foundation, and the Great Lakes Water Authority, surveyed for PFAS and PPCP in pre-stabilized sludge and biosolids. 57 Samples for 27 WRRF were evaluated for PFAS (40 compounds) by EPA Method 537.1 and Draft EPA Method 1633. The results of this surveillance study will be presented.

1:55 PM

USING RESIDUALS TO IMPROVE URBAN SOIL HEALTH

Nick Basta, PhD, Professor, Ohio State University

The benefits of land application of high-application of high-aluminum concentration water treatment plant residuals to reduce lead exposure in urban environments.

2:15 PM

**US EPA PROJECT:
ASSESSING BIOSOLID TREATMENT PROCESS
ON POLLUTANT ENVIRONMENT FATE AND
PLANT UPTAKE FOLLOWING LAND APPLICATION**

Hui Li, PhD, Professor, Michigan State University

This talk reviews the US EPA funded biosolids project on Assessing Biosolid Treatment Processes on Pollutant Environmental Fate and Plant Uptake following Land Application. The talk will focus on the presence of PFAS and Pharmaceuticals and personal care products (PPCP's) in biosolids treatment train.

2:35 - 2:50 PM

**NETWORKING BREAK
Sponsored by:**



SESSION 4: CASE STUDIES - WHAT CAN BE LEARNED

2:50 PM

INTRODUCTION TO THE CONSULTING WORLD

Dr. Kati Bell, Director of Research and Innovation,
Brown and Caldwell

Welcome to the research session.

2:55 PM

BEYOND CLASS A CAKE: A PHASED MASTER PLAN OF POST-PROCESSING UPGRADES TO ENHANCE BIOSOLIDS PROGRAM RESILIENCE AND MANAGE RISK.

Stephanie Spalding, PE, East Region Biosolids Lead, HDR

The City of Raleigh Public Utilities Department owns and operates the 75 MGD Neuse River Resource Recovery Facility (NRRRF). The project team reviewed curing, drying, pyrolysis, gasification, composting, solar drying, super critical water oxidation, and hydrothermal carbonization. The presentation will describe how the IMP team evaluated alternatives and developed a roadmap for implementing the shortlisted technologies in a phased approach, with regulatory and market triggers for each upgrade.

3:15 PM

HOW COLUMBUS PERFORMED THE FIRST MULTI-SENSOR FUGITIVE METHANE STUDY IN THE WESTERN HEMISPHERE.

Dante Fiorino, Principal Engineer, Brown and Caldwell
Stacia Eckenwiler, PE, Assistant Administrator,
City of Columbus, Ohio

As part of the Bioenergy Project at Southerly Wastewater Treatment Plant (SWWTP), the City of Columbus embarked on a field campaign to quantify fugitive methane emissions. The field investigation spanned several days and included an evaluation of the solids handling facilities, waste gas burner (WGB), digestion facilities, and the Biosolids Land Application Facility. The outcomes of the campaign led to a list of abatement options. The end solutions would reduce identified fugitive methane by 91% in the next five years.

3:35 PM

**BIOSOLIDS MANAGEMENT DECISIONS CONSIDERING
CLIMATE CHANGE AND FUTURE POLLUTANTS**

Mo Abu-Orf, PhD, Residuals Group Practice Leader,
Hazen and Sawyer

A Biosolids Waste Plan was a deliverable under New York City DEP under Energy and Carbon Neutrality Plan. The Biosolids Waste Plan included a market assessment to determine the energy and carbon benefits of various product and end-use combinations, such that DEP can plan to access markets that support its goals and a multi-facility consolidation solids plan which explored energy and carbon impacts of seventeen (17) future scenarios for the year 2050, based on permutations of in-plant technologies for solids processing, transshipment of solids between plants, additional processing, and end-use markets.

3:55 PM

**ANAEROBIC DIGESTION OF ORGANICS:
OVERVIEW OF TWO CASE STUDIES FOR RNG
AND CHP RESOURCE RECOVERY**

Dustin L. Craig, PE., Environmental Engineer, CDM Smith,
Kansas City, MO

Presentation will include discussion of industry drivers of organic diversion to AD facilities with an overview of case studies of full-scale operations Des Moines WRA producing Renewable Natural Gas (RNG) for pipeline injection and Greater Lawrence Sanitation District (GLSD) and combined heat & power (CHP) system which achieved net-zero operations.

4:15 - 5:00 PM

**INDUSTRY ROUNDTABLE
NEW AND EMERGING BIOSOLIDS
HANDLING TECHNOLOGIES**

Derya Dursun Balci, PhD, PE, Senior Associate, Hazen and
Sawyer San Diego, California

Technologies and People, TBD

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