25TH ANNUAL CSWEA EDUCATION SEMINAR

Learning from Leaders, Education Seminar 25th Anniversary

Presented by Central States Water Environment Association

APRIL 7 2020

Due to the ongoing public health crisis, we are changing the CSWEA 25th Annual Education Seminar to be held on April 7, 2020 to an online event. In order to streamline this process we will refund all paid attendees and request everyone to re-register for the online webinar via the link below. Thank you for your understanding and patience and we wish you and your families the best during this challenging time.

This will still be an exciting program focused on what we can learn from key leaders in the industry. This is an excellent, affordable event to learn about issues and technical advances from national and local experts from the safety of your own home. In addition, attendees will earn approximately seven (7) professional development hours (PDHs) for professional engineers and operator's license requirements.

Register online at *https://register.gotowebinar.com/register/2717959064669431053*

Learning from Leaders – Education Seminar 25th Anniversary

Mark your calendars and budget for the CSWEA 25th Annual Education Seminar to be held on April 7, 2020. We have an exciting program focused on what we can learn from key leaders in the industry.

This is an excellent, affordable event to learn about issues and technical advances from national and local experts. In addition, attendees will earn approximately seven (7) professional development hours (PDHs) for professional engineers and operator's license requirements.

Who should attend?

Wastewater treatment plant managers and operators, process control specialists, designers, regulators, equipment suppliers, and students involved in wastewater treatment and/or nutrients management. Regulatory agency continuing education contact hours will be awarded.

25TH ANNUAL EDUCATION SEMINAR SPEAKERS


Dr. Bruce E. Rittmann


Cindy Wallis-Lage


Dr. Nancy Love


Dr. Art Umble


Carrie Clement


Tom Kunetz


Steven R. Reusser


Mohammed Haque

DR. BRUCE E. RITTMANN
Director, Biodesign Swette Center for Environmental Biotechnology, Arizona State University

CINDY WALLIS-LAGE
Executive Director, President, Water Business at Black & Veatch

DR. NANCY LOVE
Borchardt and Glysson Collegiate Professor, University of Michigan

DR. ART UMBLE
Senior Vice President, Global Wastewater Practice Leader

MOHAMMED HAQUE
Executive Director, Global Water Stewardship and CSWEA

CARRIE CLEMENT
WLSSD Manager of Planning and Technical Services

TOM KUNETZ
Assistant Director of Monitoring and Research Chicago MWRD

STEVEN R. REUSSER
Adjunct Professor in the Department of Civil and Environmental Engineering

Register online at *https://register.gotowebinar.com/register/2717959064669431053*

See the CSWEA website for additional information *www.cswea.org*

LEARNING FROM LEADERS – Education Seminar 25th Anniversary

April 7, 2020

SEMINAR – APRIL 7

8:00 am-8:10 am: **Welcome and Introductions**

8:10 am-8:45 am: **From Treatment to Resource**
Dr. Bruce E. Rittmann, Director of Biodesign Swette Center for Environmental Biotechnology, Arizona State University

While wastewater treatment has focused on removing water pollutants, many of the pollutants are valuable resources if recovered in a useful form. This presentation focuses on novel means to capture the energy value in 'used waters', including domestic wastewater. New developments in anaerobic membrane biofilm reactors (to generate methane) and microbial electrochemical cells (to generate electrical power or hydrogen gas) now make it feasible to achieve energy-positive treatment of the BOD. After recovery of the energy from used water, most of the N and P are released as inorganic forms that can be recovered for recycle to agriculture. This talk will focus on P recovery, although many of the principle also apply for N. An important take-home lesson is that traditional techniques for 'P removal' will not work for P recovery. P-recovery techniques that produce a product useful in agriculture include precipitation as struvite or hydroxyapatite and selective sorption to Fe-based sorbents. This talk will introduce the new technologies and offer insights into their pros and cons.

8:45 am-9:20 : **Enabling Innovation on the Nutrient Management Journey**
Cindy Wallis-Lage, Executive Director, President, Water Business, Black & Veatch

Nutrient management was one of the grand challenges presented by the National Academy of Engineering for the 21st century, and the topic is a key aspect of our sustainable future. As part of the Planetary Boundaries concept developed by the Stockholm Resilience Center (2009), key researchers identified the biochemical flows of nitrogen and phosphorus as one of the most critical processes that regulate the stability and resilience of the Earth system. Finding innovative ways to address nutrient management from wastewater streams is a key component for the future of global nutrient management. Innovative approaches will involve new technological solutions for nutrient removal and recovery, but also innovative approaches and partnerships between different stakeholders. This presentation will provide a background on the journey towards nutrient removal by our industry, and discuss emerging technologies, approaches, and partnerships that will drive the future of nutrient management.

9:20 am-9:30 am **Break**

9:30 am-10:05 am:: **Achieving Resource Efficiency in Urban Water Systems and the Role of Hybrid Solutions**
Dr. Nancy Love, Ph.D., P.E., BCEE, Borchardt and Glysson Collegiate Professor, University of Michigan

America's communities depend on public sector infrastructure for drinking water supply, sanitary sewage and stormwater management, transportation, food distribution, and electricity generation and distribution. The control of this infrastructure is largely centralized, where resources serving large segments of a community's population flow in and out of a single hub. Today, these systems provide most of society with an unmatched quality of service, but are increasingly causing resource inefficiencies. Achieving resource efficiency in communities lies with creating innovative, cyber-enabled solutions that shift the focus for infrastructure from a 'one size fits all'-service-oriented approach to a resource management-oriented approach. This will create a new generation of infrastructure solutions, which comes just as much of the 20th century public-sector infrastructure is reaching the end of its design life. This talk will address resource efficiency as it pertains to nitrogen and phosphorus flows through the food-water-nutrient cycle, and the role that source separation of yellow, gray and black water at the building scale, and either localized or centralized processing for reuse can play to achieve efficient resource management.

10:05 am-10:40 am: **Biomimicry: A Force for Sustaining Utilities into the Future**
Dr. Art Umble, Senior Vice President, Global Wastewater Practice Leader

The circular economy poses a great opportunity because its primary focus is on recovering resources from waste streams and converting them into economic value. But for circular economy to become commonplace, it must mimic nature. Local municipal wastewater treatment facilities are poised for circular economy initiatives because of its relationship to natural systems. The utility of the future, however, must expand well beyond mechanical systems and utilize natural systems for recovery of energy, nutrients, carbon, metals and water. Such natural systems include microalgae and polyhydroxyalkanate-accumulating organisms for production of biofuels and bioplastics, microbial electrochemical systems that produce power, recovering rare earth elements and even decentralization of our treatment networks, with treatment wetlands constructed vertically and horizontally, in brownfields, on sides of buildings, in parks, in street medians, etc., that also couples with food production. Can we envision how by aggregating multiple local-scale circular economies connects us to the macro-scale challenges so that our contribution is meaningful?

10:40 am-11:00 am:: **Globalization of Sanitation**
Mohammed Haque, Executive Director, Global Water Stewardship and CSWEA

Sustainable Development Goal #6 indicates that as of 2015, 61% of the world's population lack access to basic sanitation (4.75 billion people). The sheer size of the issue, has seen the Gates Foundation and other philanthropic efforts spend in excess of $200 million to develop decentralized systems like composting toilets. The investment in helping 4.75 billion people is expected to be a $6 billion market and is predicted to save half a million lives. The sheer scale is tremendous. The presentation will explore the market, size, and the approach that Global Water Stewardship has taken to work with developing countries like Costa Rica on education and outreach to develop and nurture a centralized wastewater treatment market. The presentation will explore how this model will trickle down to other environmentally conscious developing countries and how the SD6 goals are actually understated from an environmental and education perspective.

11:00 am-11:30 am: **Lunch**

11:30 am-12:05 pm:: **Prying Open the Black Box**
Dr. Bruce E. Rittmann, Director of Biodesign Swette Center for Environmental Biotechnology, Arizona State University

The lecture tells the story of how the field we now call Environmental Biotechnology was created by the marriage of environmental engineering and molecular microbial ecology. It traces the roots from the day David Stahl knocked on my office door to introduce me to rRNA hybridization to today's status of Environmental Biotechnology being a leading-edge topic for research and practice to develop a range of novel processes, such as anammox, the membrane biofilm reactor, and microbial electrochemical cells. The talk introduces the science advances, the new technologies, and the key people behind them.

12:05 pm-12:35 pm: **From Rags to Resources: The Movement Towards Resource Recovery at MWRD Chicago**
Tom Kunetz, P.E. Assistant Director of Monitoring and Research for Chicago MWRD

By definition, 'waste' is material that has no perceived value. But as soon as value is assigned to that material, it is no longer a 'waste' but a 'resource'. The Metropolitan Water Reclamation District of Greater Chicago (MWRD) has a strategic goal to seek opportunities to recover resources, return materials to the economy, and where possible, earn revenues from those recovered resources. This presentation will present activities the MWRD is pursuing to turn wastes into resources, such as the largest struvite nutrient recovery facility in the world, as well as the drivers, challenges, and lessons learned on the path toward resource recovery.

12:35 pm-12:45 pm **Break**

12:45 pm-1:15 pm: **Research to Reality: The Madison MSD Legacy**
Steven R. Reusser, PE, Certified Operator, Adjunct Professor in the Department of Civil and Environmental Engineering

The focus of wastewater treatment innovation over the last 25 + years has been on nutrient removal and energy efficiency. Technology has capitalized on amazing bacterial adaptability, and the resulting process developments have been rapid and continuous. The Madison Metropolitan Sewerage District has participated in the innovation explosion since the 1970s. In-house research has been combined with annually funding two or more UW-Madison graduate students per year doing applied research. Research findings have been incorporated into many design ideas, including into several major additions between 1992 and 2016. The MMSD research during this period emphasized biological phosphorus removal, phosphorus recovery, anaerobic digestion options, and energy conservation. The energy conservation investigations included continued fine bubble diffuser research, low D.O. operation, and co-digestion of whey for increased electrical generation. The District is currently continuing this legacy of research in many areas. A discussion of some of the findings, implemented ideas, and research payback will be included in the presentation.

1:15pm-1:45 pm: **Innovation Highlights from WLSSD's 40 Year History**
Carrie Clement WLSSD Manager of Planning and Technical Services

Safety, Reliability and Efficiency have driven innovation at the Western Lake Superior Sanitary District (WLSSD) during its 40 years of operations. WLSSD is a regional wastewater and solid waste authority in Northeastern Minnesota who operates a 40 MGD high purity oxygen activated sludge wastewater treatment process with unique influent characteristics which presents challenges and opportunities for innovation.

PLEASE REGISTER ME FOR THE EDUCATION SEMINAR ONLINE EVENT

Learning from Leaders – Education Seminar 25th Anniversary
April 7, 2020

Name (First and Last) _____

Organization or Affiliation _____

Street Address _____

City _____ State _____ Zip _____

Telephone _____ Fax _____

E-Mail Address _____

Amount Enclosed _____

Are you a CSWEA member? (y/n) _____

1. Registration fee

Fee Per Person	
Education Seminar (ES)	$40
Student**	$10 (using code Student2020)

2. **No refunds will be given after March 30.**

3. **Cancelled checks will serve as registration verification.** Please provide e-mail address ONLY if additional confirmation is desired: _____

Make check payable to: Central States Water Environment Association, Inc.

5. Detach this form and mail with check to:
C/O: Central States Water Environment Association, 1021 Alexandra Blvd., Crystal Lake, IL 60014
Phone: Amy Haque 855-692-7932 ext. 102 Email: *ahaque@cswea.org*

Please indicate below any special accommodations you require from the Convention Center to allow your full participation in the Education Seminar.

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Visit our website at *www.cswea.org* for more information.

Register online at *https://register.gotowebinar.com/register/2717959064669431053*

Please register early.

Purchase orders will not be accepted.