CENTRAL STATES WATER

The Official Magazine of the Central States Water Environment Association, Inc.

96th ANNUAL MEETING RECAP

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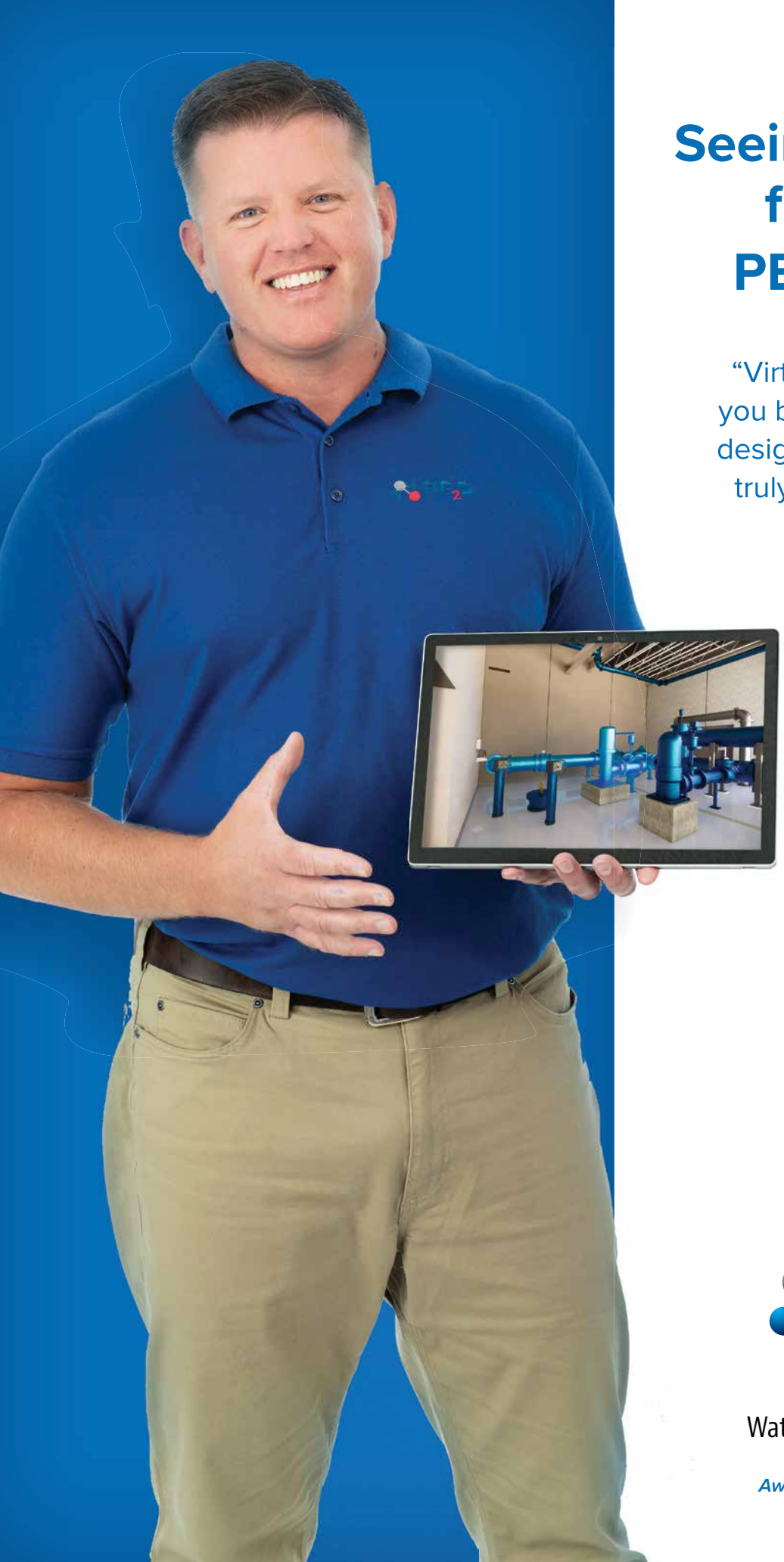
Federal tax# 23-7378788

Central States Water, the official magazine of the Central States Water Environment Association, Inc., is published four times per year. Send comments, news items, gloss photographs or digital images to Mohammed Haque, *mhaque@cswea.org*

Send undeliverable addresses to: CSWEA, 1021 Alexandra Blvd, Crystal Lake, Illinois 60014



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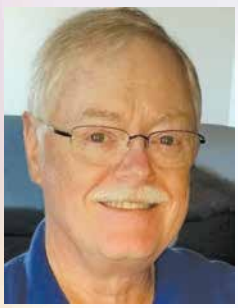
Spark Interest in the Water Industry

By Amy Underwood



"Please pause for a moment of silence in honor of Rusty Schroedel who passed away on May 28, 2023. In addition to serving in numerous positions for CSWEA, he was the association's self-appointed historian, a teacher, a comedian, a mentor, a friend, and an inspiration. He will be sorely missed and fondly remembered."

As I sat outside in pouring rain and 55-degree weather at my daughter's soccer game in early June, I found myself reminiscing about the beautiful summer weather we had for the Annual Meeting. The weather was not the only spectacular part of the week. The Meet & Greet on Monday evening was well-attended, providing a great opportunity for networking with old and new friends. Congratulations to the cornhole champions, Adam Luthin and Jon Butt, who have bragging rights for the next year. The keynote speaker, Fire Chief Matthew Love, provided a perfect start to the meeting, getting everyone moving to the music and inspiring action in all present. The attendance at the business meeting was phenomenal, likely an order of magnitude greater than at any other business meeting in the last decade. The technical sessions were once again of the highest quality. I received feedback that the organization of the PFAS technical session panel was impressive and "better than at WEFTEC." Thank you to Liz Kramer, the Local Arrangements Committee, Colin Fitzgerald, and the Technical Program Committee for all your hard work in making this meeting outstanding.

During the keynote session at the Annual Meeting, President Tracy Hodel challenged members to meet three new people during the meeting, and she led us in a networking activity during the association luncheon. Through her efforts, I met Rob Bredeson and Persephone Ma, who are introduced in the

member profiles included in this edition. I was so inspired by what they shared with me that I wanted to share their stories with you all. They are both enacting the mission of CSWEA, fostering water quality awareness by exchanging knowledge and experiences.

During my remarks at the awards banquet, I shared a little about how I got started in the water industry and my own journey with CSWEA. My interest in water quality was sparked by my high school chemistry teacher who reported on a local chemical company for polluting the river. After being just an attendee at CSWEA events for several years after college, Dean Wiebenga suggested that I join the Illinois Section Biosolids Committee. I'm very grateful to Dean. Because he approached me, I went from being an observer to being an active member of CSWEA. In line with the Annual Meeting's theme of Inspiring Action, I issued a challenge at the awards banquet to be an inspiration to others like my teacher was to me: Spark interest in the water industry; organize plant tours for local schools or scout troops; get more involved in CSWEA; judge the Water's Worth It Essay Contest or the Midwest Student Design Competition; follow up with the new contacts you made through Tracy's challenge; be like Dean and encourage other members to join a committee; or volunteer rather than waiting like I did for someone to ask you to become active in CSWEA.

Thank you for the trust you have placed in me to lead this association for the 2023-2024 period. Thank you to Tracy Hodel, Jane Carlson, Troy Larson, and the rest of the Executive Committee. It has been a pleasure working with and learning from you over the past two years. Thank you to Mohammed and Amy Haque for your continued dedication and leadership. I'm excited to see what we collectively accomplish in the next year.

The Central States Exchange (CSX) will be held at the Kalahari Resort in Wisconsin Dells on July 20-21, 2023. I intend to engage members in setting this year's goals for the Association. All members are welcome at CSX, regardless of how active you currently are in CSWEA.

Wherever you are while reading this, please pause for a moment of silence in honor of Rusty Schroedel who passed away on May 28, 2023. This past Annual Meeting was the first one that Rusty missed since 1976. In addition to serving in numerous positions for CSWEA, he was the association's self-appointed historian, a teacher, a comedian, a mentor, a friend, and an inspiration. He will be sorely missed and fondly remembered.

ABOUT THE AUTHOR

Amy Underwood has been a member of WEF since 1999. She has served CSWEA on the Executive Committee as First Vice President (2022-2023), and Second Vice President (2021-2022), the General Awards Committee, the Local Arrangements Committee (2018 and Chair in 2021) and the Illinois Section Biosolids Committee (2012-2015). Amy holds a Bachelor of Science and a Master of Science in Civil and Environmental Engineering from Michigan State University (1996) and the University of Illinois at Urbana-Champaign (1999), respectively. She is a licensed professional engineer in the State of Illinois. After20 years of planning, designing, and constructing wastewater treatment facilities as a consulting engineer, Amy transitioned to the public sector. She has been the General Manager of the Downers Grove Sanitary District since 2020. Amy serves as a member at large on the Executive Committee of the Illinois Association of Wastewater Agencies and as the Vice President of the DuPage River Salt Creek Workgroup. CS

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Water Environment Federation
the water quality people

Focusing on WEF's New Goals

By WEF Delegates David Arnott and Rich Hussey

David Arnott

Rich Hussey

As your WEF delegates, we strive to keep you up to date and provide resources and connection to WEF. Our update provides a recap and highlights of recent WEF events.

WEF UPDATES

After more than three years leading WEF, Walt Marlowe is stepping down as Executive Director. Walt led WEF during a particularly challenging and tumultuous time navigating the COVID-19 pandemic, emerging with membership intact and WEF in a strong financial position.

The WEF Board has selected Wm. Patrick (Pat) Nichols as WEF's Interim Executive Director. Pat took over officially on June 1. He has worked with the Board, Walt Marlowe, and WEF's Executive Team to ensure a smooth transition.

WEF'S STRATEGIC PLAN

All WEFs activities will be focused on its new strategic plan. Three main goals of the new WEF strategic plan include:

1. Attract and develop a diverse and passionate water workforce.
2. Cultivate a purpose-driven community to sustainably solve water challenges for all.
3. Lead the transformation to the Circular Water Economy.

As part of WEF's Strategic Plan, they have clarified their values. Below are the values that are the foundation to the plan.

1. Collaboration – Working *together* to improve our water environment.
2. Customer Service – Keeping all stakeholders and customers in mind at all times.
3. Bold Leadership – Being brave, trying new things, being growth-oriented.
4. DE&I – Continuing to promote and live by the commitment to diversity, equity, and inclusion.

2022/2023 HOD WORKGROUPS

The 2022/2023 HOD workgroups are:

1. Water Advocacy at State/Local Level.
2. HOD of the Future
3. WEF Strategic Plan Rollout.

Rich Hussey is on the Water Advocacy at State/Local Level workgroup. This workgroup just participated in a large event held in Washington DC. The National Water Policy Fly-In was held in April with over 392 attendees with 43 States being represented. This also included 25 MAs from WEF and 11 young professional scholarship recipients. At the Congressional Reception, there were over 500 attendees.

The workgroup is primarily focusing on how to leverage federal output. We are coordinating efforts by providing feedback and connecting MAs to the WEF Government Affairs Committee. We are attempting to coordinate advocacy efforts with other organizations like AWWA and NACWA. The workgroup also conducted a recent survey to understand the needs that WEF should be advocating for. The results of this survey indicated the top five

issues are PFAS, labor, funding, workforce development, operator reciprocity and certifications, and SSOs.

Dave Arnott sits on the HOD of the Future workgroup. In this workgroup, we are taking a fresh look at how to make the HOD relevant and vibrant to the MAs in the future.

The focus areas are:

1. Structure and Function of the HOD
   - How can we align the structure and function of the HOD with WEF's new Strategic Plan?
   - What language updates are required in the policies and procedures?
2. Delegate Participation
   - How do we get 100% delegate participation?
3. Planning for the Future
   - What is the vision the future of WEF and MAs? What does the HOD look like in the future?
   - How can we increase the visibility and communicate the importance of roles of WEF Delegates?

2023 WEFMAX EVENTS

Dave and Rich attended each attended a WEFMAX event in the spring. These are events where MAs come together to share ideas and best practices.

Dave attended the April 12-14 WEFMAX in St. Louis, MI (hosted by Missouri WEA). The theme of this WEFMAX was "improving your MA through partnership and collaboration." Joe Lapastora gave a talk at this event on the success of the CSWEA's Midwest Regional Student Design Competition highlighting partnership and collaboration. Brainstorming sessions were held to generate answers to questions such as:

1. How can we bring new operators to the industry?
2. How can we better explain and sell the value of involvement?
3. How can we ask more people to contribute their time?
4. How can we improve communication within our MAs?
5. What current communication methods in the HOD can be improved?
6. How can we approach the challenges of collaboration with AWWA respectfully?
7. How can we explain the HOD and increase understanding?
8. How can we be gentle but accountable as volunteers?
9. What steps can we take to mentor the next generation?

Rich attended the May 3-5 WEFMAX in Denver, CO (hosted by Rocky Mountain WEA). The theme of this WEFMAX was "improving MAs through member engagement and service."

The various discussions of the meeting included the following:

1. What word best describes 'engagement?'
2. What is the best way to measure member engagement?
3. What is one way your MA could better serve its members?
4. What got you engaged in your MA?
5. What has been your most rewarding way to serve through your MA?

The meeting also held a number of moderated panel discussions, including:

1. Member Engagement and Development
2. Gaps in Member Engagement
3. What Do Young Professionals (YPs) and Emerging Professionals (EPs) Want from a Professional Organization?
4. Member Association Staff Day-to-Day Needs

WEFMAX allows MAs to gain additional perspectives and successes and challenges from other MAs throughout the country. The meeting is comprised of various leaders from various backgrounds across our water/wastewater industry.

There was a WEFMAX on May 24-26 in Charlottetown, PEI, Canada (Hosted by Atlantic Canada W&WA). The theme for this event was "improving MAs through leadership innovation." Neither Rich or Dave were able to attend this event.

There was a virtual WEFMAX on July 20. The theme for this event was "the best of the best." This is where the most popular sessions from each of the three previous WEFMAX events were shared.

WEFTEC 2023

WEFTEC 2023 takes place in Chicago, IL from September 30-October 4. Housing and attendee registration is now open. Visit *www.weftec.org* for more information.

As WEF Delegates, we are here to support you and represent the interests of the CSWEA to the House of Delegates and WEF. If something is on your mind, please feel free to call or email David at *darnott@ruekert-mielke.com* or Rich at *rhussey@lai-ltd.com*. We are here to serve you/CSWEA and be a liaison to WEF leadership. CS

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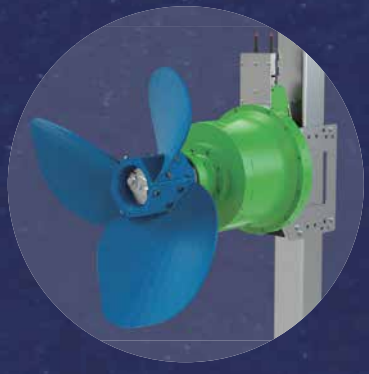

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Little Things Equal Big Things

By Chris Lefebvre

After I got home from the CSWEA Annual meeting, I had a conversation with a close friend about coaching 12-year-old baseball players. His coaching motto has always been "Little Things Equal Big Things." That conversation reminded me of all the little things we do as individuals and how those little things are what make this organization great. We each do little things every day to improve our industry and normally we don't even realize that we are doing them. These little things might be guest speaking at a high school science class, giving a tour of your wastewater treatment facility, participating on a CSWEA committee, or talking through facility issues with a colleague. As an association, we consistently do the little things for our industry and it has made CSWEA into one of the best member associations in the country. As the Wisconsin State Section Chair, my goal is to continue to foster an environment that encourages our members to do the little things to improve our industry and organization.

As of the writing of this article, we are a few weeks removed from our last frost advisory so it is safe to say mosquito and construction season has arrived. The summer months are always filled with vacations, cookouts, and – in my house – lots of youth baseball. There are also some great CSWEA events to attend this summer in Wisconsin. It all starts July 20-21 with the annual CSX meeting at the Kalahari Resort in Wisconsin Dells. This is a family friendly event so bring the kids along to enjoy the water park. Then mark your calendars for the Northwoods Collection System Seminar in Marshfield on July 27. The State Section meeting, Management Seminar with AWWA, and the YP Brewer Outing are all planned for the Milwaukee area on August 3. Pick one of the meetings to attend during the day and afterward, come network with the future of our industry while watching the Brewers play the Pirates at American Family Field. We will also be hosting another great in-person event on August 17, the Industrial Pretreatment Seminar in Appleton. I hope to see you at a few of these great events.

Summer also means that it is nomination season. Central States recognizes over 20 individuals each year for doing a great job. There are awards for excelling at everything we do as an organization. Do you know anyone that is doing great things for their community, our industry, or the environment? If you do, nominate them for an award. The list of awards is located on the CSWEA website under the 'Recognition' tab. I think Troy Larson said it best at the annual meeting: "If people close to you aren't getting recognized for their achievements, it might be because you aren't nominating them." I understand that the nomination process can be a little intimidating at first; I know it was for me the first time I went through it. But it is worth the effort to see a colleague get recognized for their hard work. If you need some help as you go through the nomination process, feel free to reach out to me. If I can't help you, I will get you in contact with someone that can.

Have a great summer and thank you for your continued dedication to doing the little things. CS

What is Your Water Story?

By Samidha Junghare

For those of us who were able to attend the CSWEA Luncheon at the Annual Meeting, you know that one of our networking exercises was to share with others at our table the answer to the question: "What is your water story?" Well, we were having so much fun at my table explaining our cell phone background photos, that we ran out of time to share our water stories. I thought this topic might be a good way to introduce myself to you as the new chair of the MN Section of CSWEA. I hope to have the opportunity to meet as many of you as possible and learn your water stories as well!

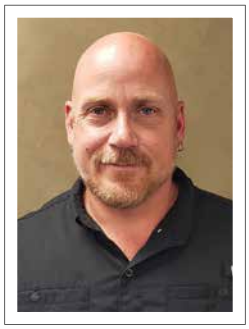
My water story starts after I finished college in the Twin Cities (B.S. Chem Engineering, University of Minnesota). I went to work for a pharmaceutical company in Chicago and spent seven years there. One of my favorite roles was as a fermentation manufacturing engineer making antibiotics. Then I switched companies and went on to spend three years making Cheerios as a "Puffed Cereal Systems Engineer" in Georgia. When my husband and I wanted to add to our family, I realized I wanted to return home to MN. We landed in Duluth, but there is not much manufacturing here, so it was a difficult road. That's until I was offered a temp job at the Superior WI Environmental Services Department, where I first dipped into wastewater treatment. Lo and behold, there were many of the same concepts as my manufacturing days, process monitoring (including looking at reactor DO and pH trends of biological systems) and optimization of various unit operations. The NPDES requirements seemed both different and analogous to FDA regulatory and quality compliance requirements. After three years at Superior, I came to WLSSD in Duluth and have spent the last (almost) 15 years here. It has been so fulfilling working in the water, energy, and nutrient sector – water is life and I am so grateful my path has led me here.

It was about four years ago that I started to get more heavily involved in CSWEA when Kathy Crowson convinced me to take on the role as chair of the MN Operations/Safety/Lab Committee. At first, I was reluctant to take on a role that "took me out of my comfort zone," but I am truly glad for her leadership and encouragement that has led to me being more involved in CSWEA. I have really enjoyed participating in the amazing conferences that CSWEA hosts, having such valuable resources available to me, and feeling like I have made friends in the industry, not just colleagues. You are all in a position to encourage yourselves, your colleagues, and future professionals to attend our events and get involved as committee members – so please do!

Now that my introduction is out of the way, here is an update on MN section. We hosted the Annual CSWEA meeting last month, and by all measure's it was a huge success. We had record attendance and very highly rated technical sessions. Kudos to Liz Kramer for doing an amazing job as Local Arrangement Committee Chair. This week we gathered in St. Cloud for MNX, where our committees shared updates and we kicked off planning and discussing goals for next year. Some highlights include Sam Lobby and Ashley Hammerback participating in the WEF DC fly-in, the selection of Joanna Bernus as the MN state winner of the Stockholm Junior Water Prize, and huge participation in the R2E (Resource Recovery and Energy) Committee, which has grown to more than 30 members. The Students & YP committee are arranging a tour of the Ostego East plant in mid-July and a construction tour with MCES this summer. The stormwater committee has a bike tour planned for September. The industrial waste committee is targeting an industrial pre-treatment seminar for mid-August. The collection system committee will be holding a fall workshop in Duluth in September. Planning for the Conference on the Environment as well as the Innovative Conference is already underway. If you have interest in helping to plan any of these awesome events and getting to network with other wastewater and stormwater professionals, consider joining one of our committees. Please visit the CSWEA website and fill out the "Get Involved" form under the "About Us" tab on *www.cswea.org* or reach out to me directly at *samidha.junghare@wlssd.com* or 218-740-4841. CS

An Exciting Year for CSWEA

By Jason Neighbors



Here is to another great year for the Illinois Section! It is my honor to serve as the 2023/2024 Illinois Section Chair. I am excited to work with all of you to keep the excitement rolling as we head into the summer. Let's please take a moment to thank our immediate past chair Jillian Kiss for her hard work and leadership in the Illinois section. Thank you, Jillian! In addition, thanks are in order for all the committees and their hard work finding new ways to educate and mentor the future of our industry. Without your dedication, many outlets would not be available to upcoming and veteran members of our MA alike. As well, all of this would not be possible without the hard work and dedication from our Executive Management, Mohammed and Amy Haque.

My involvement in CSWEA began many years ago when I was asked to join a committee. As I can remember, I was quite intimidated at first. But as I got more involved, I found that those around me had an eagerness to provide guidance and mentorship that was awe-inspiring. It gave me the confidence to take on more and more challenges and try to give back in the very way that I was welcomed into CSWEA.

This summer had many great events to attend, like the Stormwater and Collection System Conference on June 20 at the NIU-Naperville campus, which hosted great technical sessions, networking opportunities, and operator training.

Another exciting event this summer was the Central States Exchange (CSX) in Wisconsin Dells on July 20. The event brought members together to share innovative ideas for strengthening the association and discuss future possibilities.

Be sure to check out what the Operations Committee has been up to. There are monthly scheduled Operator Training webinars to further your knowledge, review for that next certification, or get in your CEUs. As well, there is an Operations Seminar on September 13, hosted at the Naperville Illinois Springbrook Water Reclamation Center. This event will have three technical presentations on PFOS, our first Operator Round Table on trouble shooting BNR issues, and to cap it off, a tour of the host facility.

These events are just a few of the many to come this year. Watch the CSWEA website for upcoming events from all of the committees. If you are interested in getting involved and don't know where to start, reach out to one of the committees that sounds interesting to you. I can speak from personal experience that it will be a welcoming environment and will open up opportunities to showcase your talents to help the Section. You will also find lifelong friends and colleagues to help you throughout your career along the way. Networking is an invaluable tool and helps to make us all stronger.

I am looking forward to seeing everyone out there this year at one of the meetings, events, or social gathering! CS

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INTRODUCING CSWEA'S 2023-2024 SECTION OFFICERS

The Central States Water Environment Association is made possible by member volunteers, who help make CSWEA's mission statement a reality. Thank you to all the members taking on roles in the upcoming term.

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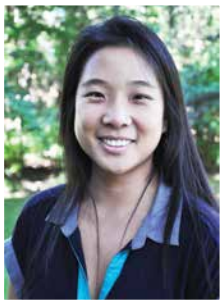


Persephone Ma

Environmental Engineer, Brown and Caldwell

"Persephone feels fortunate to have found a consulting engineer job where she can continue working on the beneficial reuse of biosolids. She now works with communities on their biosolids master planning, figuring out how they can use the solids they have to meet their goals for sustainability."

Persephone Ma grew up in Washington, DC before moving to Chicago to get a bachelor's degree in geophysical sciences at the University of Chicago. After working in different fields for a few years, Persephone moved to St. Paul, MN to complete her doctorate in soil science at the University of Minnesota.

Persephone has always been interested in beneficial reuse and circular economies, particularly for food waste and food systems. She wanted to know what was happening in the soil when waste is recycled. She feels very lucky to have found a project which focused on the recycling of plant nutrients and which connected the food system to become more sustainable. In her research, she applied sewage sludge incinerator ash generated by the Metropolitan Council in the Twin Cities to farm fields growing corn and soybean. Her findings were positive, showing the crops were able to uptake the phosphorus in the ash while applying minimal metals of concern. During her research, she realized that if she wanted to continue working at the intersection of wastewater residuals and soils, engineering skills would be a necessity, and she completed a master's in environmental engineering while there as well.

Persephone feels fortunate to have found a consulting engineer job where she can continue working on the beneficial reuse of biosolids. She now works with communities on their biosolids master planning, figuring out how they can use the solids they have to meet their goals for sustainability. She is excited to learn about other aspects of wastewater and to work with new engineers and clients.

Persephone is currently the interim chair of the Outreach Committee for the Midwest Biosolids Association (MBA). While she joined the MBA because it aligned with her career focus, Persephone really wanted to be involved on the Outreach Committee. She believes that communication with the public is important as public perception has been the driver for the PFAS regulations and restrictions in other parts of the country. The MBA is a regional, collaborative community trying to make sure that science is used and applied correctly and that utilities are protected so nutrient recycling through the beneficial use of biosolids can continue once PFAS regulations are implemented in the Midwest.

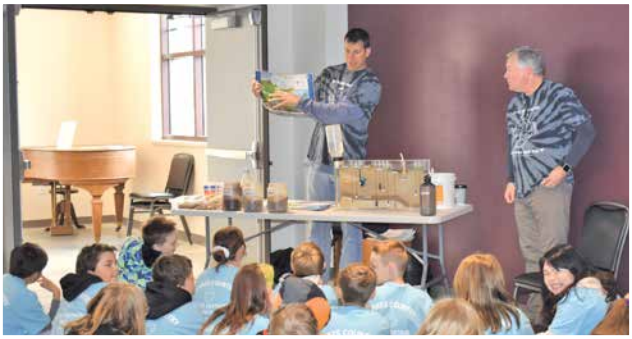
Persephone is a new member of CSWEA and is looking forward to becoming more involved in the association. CS

Rob Bredeson

Water/Wastewater Supervisor, City of Detroit Lakes, MN

After completing his degree in water resources at Vermilion Community College in Ely, MN, Rob Bredeson spent most of the first 30 years of his career with the City of Cambridge, MN. While there, he was responsible for water distribution and wastewater collection and treatment. He set up their laboratory, which he got certified, and eventually became the Assistant Utility Director. His experience with four large plant construction projects at Cambridge led him to the City of Detroit Lakes, where he started in the middle of a construction project. Rob has been with the City of Detroit Lakes for five years now and is responsible for water distribution, 73 lift stations (64 wastewater, 9 stormwater) and the wastewater treatment plant (WWTP). The 1.86 MGD membrane bioreactor (MBR) plant has the lowest total phosphorus limits in the US at 0.06 mg/L.

One of the aspects of working for the City of Detriot Lakes that Rob has found very rewarding is engaging with local youth at the Lakes Country Water Festival, which Rob's predecessor and the City's lab analyst started in 2000. The City's public utilities department typically hosts 400 fourth grade students at the annual event, which is held in a local community center. Students rotate throughout the day through 14 classrooms, which have presentations and hands-on displays set up to teach about water and water conservation. The City's public utilities staff gives presentations showing the cycle of water through the community – from how drinking water gets to their homes, to collection of sewage, treatment, and discharge of clean water to the lake. Other presentations include a demonstration on chlorides and the impacts of softeners on WWTP discharges, a display on groundwater and wells by Minnesota



Rural Water Association, Essentia Health explaining the impacts of dissolved sugar in water on the kids' health and impacts the WWTP in the form of biological oxygen demand (BOD), and a river table set up by the Minnesota Department of Natural Resources which they use to teach how rivers are affected by agriculture. The City pays for the Science Museum of Minnesota to give a "Water Talk" in the auditorium. Among the other presenters, who are all volunteers, are the Pelican River Watershed District, the local and state public health departments, Becker County Soil and Water Conservation District, and the Minnesota Pollution Control Agency.

Attendees are also offered the opportunity to tour the WWTP on a different date. In 2023, five tours of the plant for approximately 100 students total were given following the event. CS

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This year's meeting took place on May 22-24 at the Saint Paul RiverCentre in St. Paul, MN.
It was a wonderful opportunity to see old friends, meet new people, and celebrate our fellow water professionals.

THANK YOU TO EVERYONE WHO ATTENDED AND WHO HELPED MAKE THIS CONFERENCE A SUCCESS!

Passing of the Gavel/Red Suspenders
Tracy Hodel, CSWEA President 2022-23 and Amy Underwood, CSWEA President 2023-24 performed the Passing of the Gavel and Red Suspender CSWEA traditions at the Annual Meeting.

GWS NCAA March Madness Champion
Joe Lapastora

Golden Manhole Society Inductees

7S Society Inductees

CSWEA Awards

CSWEA Service Award
Tracy Hodel, CSWEA President 2022-23

CSWEA Service Award
Chris Marschinke, Illinois Trustee, 2021-23

CSWEA Service Award
Rachel Lee, Wisconsin Trustee, 2021-23

CSWEA Service Award
Matt Streicher, PWO Representative, 2021-23

Operations Award – Minnesota
Joshua Gad, Mankato, MN

Operations Award – Illinois
Jeff Barta, Downers Grove SD, IL
(Received by Bob Swirsky)

Operations Award – Wisconsin
Chris Lefebvre, Stevens Point, WI

Collection System Award – Minnesota
Adam Salo, HR Green

Collection System Award – Illinois
Paul Siegfried, Baxter & Woodman

Collection System Award – Wisconsin
Chris Tippery, raSmith

YP of the Year Award – Minnesota
Quentin Hahn, MN

YP of the Year Award – Illinois
Tom Romza, IL

YP of the Year Award – Wisconsin
Jake Becken, WI

Water Stewardship Award
Joe Lapastora

Industrial Environmental Achievement Award
Land O'Lakes, Melrose, MN

Sustainability & Green Infrastructure Award
Kishwaukee WRD, DeKalb, IL

Bill Boyle Educator of the Year Award
Brooke Mayer, Marquette University
(Received by Patrick McNamara)

Academic Excellence Award
Charles Christen, St. Cloud State University

Academic Excellence Award
Olutooni Ajayi, University of Minnesota – Twin Cities

Kelman Scholarship Award
Shayden Harvey, Faviola Perez-Mercado, Alondra Rodríguez and Alondra González, Marquette University

Midwest Student Design Competition Awards

Global Water Stewardship Category (US Winner)
Marquette University

WEF Water Environment Category
University of Wisconsin – Madison

Global Water Stewardship Category (International Winner)
Universidad de Costa Rica

WEF Wastewater Category
Milwaukee School of Engineering

Water Environment Federation Awards

Laboratory Analyst Excellence Award
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Quarter Century Operators Club
Thomas Dickson

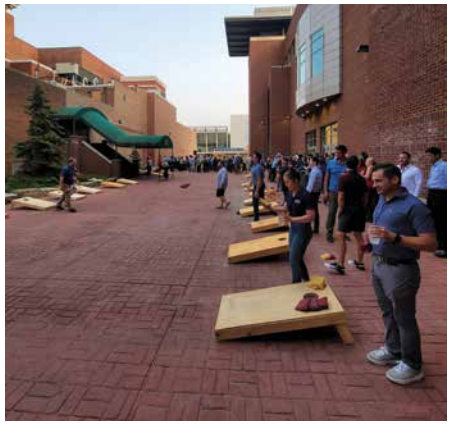
Conference Highlights









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28TH ANNUAL CSWEA EDUCATION SEMINAR RECAP

This year marked the 28th Annual Education Seminar, Making Solid Decisions in an Uncertain Future – Wastewater Solids Management. The committee would like to thank each and every attendee for their participation which brought more than 160 people in-person to Monona Terrace in Madison, WI. The program offered a well-rounded line up speakers with a wealth of perspective and experience. The primary focus was on existing and emerging concerns related to biosolids. This year's seminar also included collaboration with the CSWEA Innovation & Technology (I&T) Committee, who hosted dinner the evening before the Seminar at Cooper's Tavern. The event was open to all attendees and provided an opportunity to highlight innovation in our field and provide additional networking for a record 60 participants. Dinner included a presentation by Nick Bartolerio of Strand Associates who presented on various innovative processes within wastewater treatment.

The first speaker of the day, **Greg Kester**, spoke on Biosolids Challenges and Opportunities. Greg's presentation highlighted California's adoption of multiple legislative initiatives to mitigate climate change impacts and summarized how the Wastewater Sector can help achieve all of them. Co-digestion and

recycling biosolids to soil are key opportunities. PFAS and other challenges such as conflicts with Clean Air Act requirements must also be addressed. The presentation provided details on these opportunities and challenges and how they transfer beyond California.

Tess Richman, Biologist in Biosolids Office at USEPA, provided an update on recent activities including the biosolids risk assessment framework, the status of the PFOA and PFOS risk assessment, stakeholder engagement and research updates. The Office of Water (OW) at the EPA has responsibility for evaluating microbial and chemical risks resulting from the use and disposal of biosolids, i.e., treated sewage sludge from wastewater treatment plants. Tess walked the group through how OW has developed a human and ecological framework to assess the risks resulting from chemical contaminants in biosolids that are land applied to farm fields or disposed of via landfilling.

Dr. Carl Rosen then presented on Agricultural Usage of Biosolids and Residuals. The presentation focused on the use of biosolids as a beneficial soil amendment for crop production, which has been a common practice for many years. Dr. Rosen's discussion briefly addressed current criteria established for biosolids application including metal loading, pathogen reduction, and nitrogen content. Organic contaminants such as pharmaceuticals, personal care products, microplastics and other compounds such as per and polyfluoroalkyl (PFAS) substances can end up in the waste stream and their risks are currently being evaluated. In particular, proposed limits for PFAS could have significant impact on the future of biosolids use in agriculture. The difficulty associated with conducting systematic studies on PFAS as a contaminant in biosolids was discussed.

Tammy Helminski, a partner at Barnes and Thornburg Law Offices, presented on The Legal Side of PFAS Regulation and how USEPA and State agencies are moving quickly to develop regulatory requirements governing PFAS, including drinking water standards, surface water quality standards, groundwater quality standards, biosolids management requirements, product substitution and source control requirements, and even air emission standards. Many of these new regulations will impose major costs on municipalities, and may require significant changes to plant operations and pretreatment programs. Tammy reviewed the types of new requirements that are being issued and what can be expected going forward, and discussed how municipal water, wastewater, and stormwater utilities can plan to address these requirements and their impacts.

Lunch was followed by welcoming **Dr. Patrick McNamara** to talk about how per and polyfluoroalkyl substances (PFAS) have been an increasing focus of the public, legislative bodies, and the regulatory community. Nationally, interest in thermal treatment technologies has increased as a means to potentially remove PFAS while generating beneficial end products. Dr. McNamara talked about pyrolysis a thermal process that occurs in the absence of oxygen and generates a beneficial solid product (biochar), py-gas that can be used for energy recovery, and py-liquid that is difficult to handle. The presentation highlighted benefits of pyrolysis along with current challenges and the impact of pyrolysis on the fate of PFAS based on recent research.

Llyod Winchell of Brown and Caldwell emphasized the fact that wastewater facilities regularly receive per- and polyfluoroalkyl substances (PFAS) contaminated influent flow and certain PFAS partition to the solids generated during treatment. Of all the commonly applied solids treatment technologies, only incineration offers the potential to destroy PFAS but sparse information can be found on the fate of PFAS through incineration process, and even less when considering sewage sludge incinerators (SSI). The data currently available suggests some PFAS destruction will occur through an SSI. The research presented aimed to better understand the extent of destruction through SSIs.

The event concluded with three public utility speakers presenting on their real-world challenges and opportunities related to biosolids and how they are managing and planning for changing regulations. **Josh Lutz** and **Joe Cook** of the City of Columbus Public Utilities (OH) highlighted the City's commitment to 100% beneficial reuse of its wastewater residuals stream. They walked through how their team has achieved this goal through the use of a diverse and region specific biosolids management program. **Chris Lefebvre** from the City of Stevens Point, WI, spoke on the uncertainty of the future of biosolids management and concerns over land availability and emerging pollutants. These concerns have forced many municipalities, including the City of Stevens Point, to explore and implement new technologies to continue responsible biosolids management. Chris's presentation highlighted biosolids drying and the many different types of dryer technologies currently in use in the region. Lastly, Emma Watson of the City of St. Cloud, MN, walked through the transformation of St. Cloud's Wastewater Treatment Facility to resource recovery and energy efficient facility. Highlights included their implementation of innovative technologies such as thermal hydrolysis (Lystek), struvite harvesting (Ostara), and liquid Land Application of the LysteGro product.

Throughout the day, attendees were provided with the most relevant case studies, regulations and lessons learned related to biosolids and residuals management. There is still much to be learned on the ultimate regulations and best management practices related to PFAS but the speakers from the event provided encouragement and energy discussing our passion and sharing our stories.

Copies of presentations are available on the CSWEA website, and the Education Seminar Committee has already begun planning next year's seminar. We look forward to seeing you April 8 and 9, 2024. CS

REACHING OUR FULL POT

Lessons Learned from the AWWA/WEF

By Rahim Ansari, Students and Young Professionals WI Section Co-Chair, and Ethan Yen, Students and Young Professionals Committee WI Section Member

In March 2023, 225 young professionals in the water sector met in Sacramento, CA to attend the Young Professionals (YP) Summit. Jointly offered by WEF and the American Water Works Association (AWWA), the YP Summit brings together young leaders in our industry from across the country to provide training and networking opportunities to best serve and improve the water sector. Each year, CSWEA sponsors a group of YPs from all three member states to attend the YP Summit and share what they have learned with those back home.

The first day of the summit featured workshops that focused on YP development in the water sector. Attendees participated in either the AWWA YP Leader Training Workshop or the WEF Emerging Young Professionals Leadership (EYPL) Workshop. The 57 attendees of the EYPL Workshop consisted of a mix of consultants, equipment suppliers, operators, and utility and government employees ranging from 0 to 10 years of experience, with many attendees having 5-10 years of experience.

The EYPL Workshop started off with attendees filling out a self-assessment tool to identify their workplace personality style from four categories – Dominance (D), Influence (I), Steadiness (S), and Conscientious (C) – based on their working pace (outgoing/faster pace vs. reserved/reflective pace) and their focus (task-oriented vs. people-oriented). Understanding our working styles helps us leverage our strengths and become more effective team members. For instance, professionals with D styles want just the facts

ENTIAL:
YP Summit

in a meeting, C styles prefer to have a set agenda, and I and S styles prefer time for small talk to connect with others. D and I styles may prefer to be acknowledge publicly for their accomplishments, while S and C styles prefer to stay in the background. These styles inform how we function by ourselves, in a team, and as a leader.

Discussion transitioned to the value of having a mentor for guidance and support during a YP's career. Attendees discussed what makes a good mentor and mentee. At the core of a mentor relationship is trust, and if neither party is willing to listen to the other or enter with a curious mind, the relationship will struggle. Effective mentorship relationships rely on clear communication and expectations and can be mutually beneficial to both the mentor and mentee.

Using *10 Ways to Have a Better Conversation* by Celeste Headlee, attendees reflected on their communication styles and challenges and discussed strategies to bring these 10 Ways into their daily lives. Ways for effective communication included avoiding multitasking; listening to understand and not to reply; and focusing on key points, not details.

> ***The YP Summit is an invaluable experience for professionals starting their careers and looking to develop skills to identify and achieve their professional goals.***

Finally, seasoned professionals and YPs in leadership positions shared their experiences when encountering challenges and changes in their career. Being new to the water sector, it is easy for YPs to doubt themselves and take each failure with a heavy heart. Experience requires time, and when YPs feel discouraged, it is important to refocus and rekindle the passion that led us to the water sector. This passion allows us to reflect on shortcomings and tackle challenges with renewed vigor. Hearing from others in similar career stages provided encouragement and guidance for those with similar challenges and aspirations.

The theme of the YP Summit was "The Future of *Our* Water." During the second day, all YPs from WEF and AWWA attended presentations by six speakers ranging from consultants, utility managers, environmental policy experts, and entrepreneurs, each with a unique perspective and lessons for YPs who wish to take ownership in the development of the water sector. Speakers provided guidance for enhanced effectiveness in the industry and on matching your interests and passions with the right role. Speakers also facilitated workshops on how to best capitalize on enriching opportunities.

Our key takeaways from the two days of workshops and presentations are as follows:

1. Use your leadership style to enhance the interactions you have with team members, clients, mentors/mentees, and your peers. This comes from understanding the four workplace style categories and how each individual prefers to communicate and process information.
2. Stay knowledgeable in current affairs allows you to be an effective advocate of your profession and the world of water.
3. Review *10 Ways to Have a Better Conversation* regularly so that the needs of their team members, clients, and others are met. Effective listening and communication are often overlooked or not practiced as well as they should be.
4. Volunteer for new opportunities or challenges. You gain experience by seeking challenges, even those that are uncomfortable or may be outside of your range of expertise. Overcoming challenges will show more about your character and work ethic than any other experience or opportunity.
5. Seek out those who are knowledgeable in a certain topic, an expert in their field, or better than you in a certain skill. Learn from them and ask questions. In turn, be known for something, whether it's a technical or soft skill, people will remember you for it.

The YP Summit is an invaluable experience for professionals starting their careers and looking to develop skills to identify and achieve their professional goals. It taught valuable leadership skills and lessons on effective teamwork, all of which can be shared with and applied within your organization. Events such as these offer valuable networking opportunities with YPs in different job functions and provide renewed motivation for YPs by providing a larger perspective on their role in the water sector. We would like to thank CSWEA and all organizations that provide support for YPs to attend such events. Attendees of the YP Summit return with fresh minds and motivated hearts, ready to tackle the challenges of the day-to-day to move the sector towards a brighter future. CS

NATIONAL WATER WEEK POLICY FLY-IN

By Brandon Koltz (Brandon Koltz Water & Environmental Consulting LLC, Carthage College, and Milwaukee School of Engineering), Chris Tippery (RA Smith), and Sam Lobby (Western Lake Superior Sanitary District)

The 2023 Water Week Fly-In was in Washington DC on April 24-26, sponsored by WEF, the National Association of Clean Water Agencies (NACWA), the Water Research Foundation, and the WateReuse Association. Brandon Koltz and Chris Tippery attended to represent the WI Section and then attended the National Stormwater Policy Forum on April 24 (co-led by WEF and the National Municipal Stormwater Alliance). Other attendees included Michael Mucha (Madison Metropolitan Sewerage District); Paul Kent (Stafford Rosenbaum LLP); and Tom Sigmund (New Water); as well as MN Section Reps. Sam Lobby and Ash Hammerbeck.

The National Stormwater Policy Forum

Highlights from panels included:

- Recognizing the historical underfunding of stormwater management/ water quality improvement.
- Updating the storm statistical definition within Atlas 15, including the effect of more frequent extreme events. These updated models consider and evaluate the effects of climate change on infrastructure design.
- Seeing potential and recommending to incorporate stormwater management into Integrated Planning and overall capital improvement programs for wastewater discharge requirements and water resources improvements.
- Identifying how emerging contaminants are an increasing issue for stormwater and wastewater. In addition to PFOA/PFOS, a new compound (6PPD [Quinone]) was noted to be in the risk research area. New technologies may be required to manage these compounds.

The WEF Stormwater Institute and NMSA prepared a separate stormwater summary document for legislators (*https://bit.ly/3JryBUl*).

April 25, 2023 (US EPA Update)

Office of Water (the Office) officials provided updates and other policy information.

Radhika Fox (Assistant Administrator) was interviewed by **Tom Sigmund** (Executive Director, New Water, President of the NACWA, WI Section member). Fox discussed PFAS and following the science with respect to best management practices. They are working to get appropriated funding out to assist the water sector with upcoming projects. The PFAS Roadmap includes research, restrict, and remediate. We need source control to prevent continued entry of these compounds into the environment and enforcement discretion. Cleanup should be by responsible parties. Mean Concentration Limits (MCLs) have been defined for six PFOS compounds in drinking water. A risk assessment is ongoing for PFOS in biosolids. $3M of WIFIA funding has gone to

reuse projects, which are important for climate resilience. A consistent definition of WOTUS is fundamental to the *Clean Water Act*, though WOTUS has been halted in 24 states. The water workforce is a continuing concern.

Andrew Sawyer (Director, Office of Wastewater Management) discussed funding opportunities and program updates. They are working on providing online funding matches with a focus on community relations, working with 34 counties, focused on smaller rural counties and tribal lands. He said 65 of 740 CSO communities have significant low-income populations. The EPA expressed a need for continued funding to address CSOs. Resource recovery is a priority for the EPA. Recognition of the ambiguity in the Build America, Buy America (BABA) within the Bipartisan Infrastructure Law (BIL) requires additional guidance. Pollutant trading policies will be developed based on a baseline concentration and extrapolated to nonpoint sources. The EPA will be seeking comments for post combined sewer overflow (CSO) long-term control plan (LTCP) requirements.

Deborah Nagle (Director, Office of Science and Technology) provided an update regarding criteria development. Aquatic criteria for PFOA/PFOS is being revised based on water concentration and fish tissue analysis. Laboratory method 1633 is completing, with the multi-lab validation for eight matrices. A recommendation on the PFOA/PFOS concentration in aquatic life may be issued soon. A screening method for wastewater is in development. The OST is completing a biosolids risk assessment in 2024 and engaging with municipalities on the issue. A POTW PFOA/PFOS influent study is ongoing within 150-196 utilities. Updated meat and poultry categorical limits are in progress. A metal finishing rule update is in development.

Jennifer McLain (Director, Office of Ground Water and Drinking Water) stated that a survey on aging infrastructure found the need for $625 billion in the next 20 years. Lead supply lines continue to cost significantly. A landfill leachate rule is in development. The revision of disinfection byproducts will further public health. The Office is offering tools and training are available on important cybersecurity methods.

Russel Kaiser (Acting Director of Oceans, Wetlands Communities Division, Office of Wetlands, Oceans and Watersheds) said the recent WOTUS rule is science and feedback-based. The Appeals Court made decisions on WOTUS in May 2023. 404(g) State and tribal-administered programs (dredge and fill) must be no less stringent than the federal program. 303(d) programs have greater flexibility. There is additional funding and greater eligibility for the 319 grant programs.

Sharon Nappier (National Program Leader, Water Reuse) says they have 63 action commitments. The program is working with state regulators to facilitate reuse. There is a high eligibility for funding – $310 million of $766 million are unused to date. The program is working to resolve bacterial issues.

Shannon Zaret (Management and Program Analyst, Office of State and Community Energy Programs, US Dept. of Energy) noted energy management programs for wastewater facilities.

Karen Woodrich (Deputy Chief for Programs, Natural Resources Conservation Service, USDA) said they work from the local level to maintain relationships with landowners and promote "sustainable food production systems." They are looking at carbon monitoring and sequestration across all types of agricultural facilities. NRCS encourages participation in watershed programs. Learn about the Regional Conservation Partnership Programs (RCCP) at *www.farmers.gov*.

Matthew Maucieri (Substituting for David Palumbo, Deputy Commissioner, US Bureau of Reclamation Department of the Interior) described water resources collaborations in 17 western states. The Bureau of Reclamation operates 380 reservoirs, with one in five western farms dependent on that water source. He discussed the impacts of climate change and the impacts to the Colorado River basin. Reservoirs are at the lowest levels since constructed. The *Inflation Reduction Act* has funded additional programming for the Colorado River. Adaptive management measures are important to ensure productive fund spending.

APRIL 26, 2023

Three US Reps. discussed the water sector and funding:

- **David Rouzer** (R-NC) Chairman Subcommittee of Water Resources and Environment/House Transportation and Infrastructure Committee.
- **Bill Johnson** (R-OH), Chairman, Subcommittee on Environment, Manufacturing and Critical Materials/House Energy and Commerce Committee.
- **Paul Tonka** (D-NY) Ranking Member, Subcommittee on Environment, Manufacturing and Critical Materials House Energy & Commerce Committee.

The three stated their satisfaction with funding provided in the current fiscal year, though a difference of opinion regarding funding for water will be included in the FY24 appropriations.

Sean O'Donnell (EPA Office of Inspector General [OIG]) discussed his role in ensuring program integrity within EPA. He reviews and audits state SRF programs, which includes looking for instances of bid rigging for projects, failure to meet business requirements, and false claims. The FBI helps the investigation of cyber-intrusion events. OIG has subpoena authority greater than grand juries. Whistleblowers are granted confidentiality.

Brandon and Chris met with Reagan Harrison of Rep. Scott Fitzgerald's staff to discuss continued funding, PFOS, and other issues the joint "ask" document (*https://bit.ly/3PuLZLj*). Michael Mucha and Paul Kent met separately with Senator Tammy Baldwin's office.

Sam Lobby and **Ash Hammerbeck** scheduled a number of meetings with different Minnesota Offices. Due to the House Debt Limit vote, meetings had to be done with staffers from the offices of four Democratic Reps. (Senator Tina Smith, Rep. Angie Craig, Rep. Dean Philip, and Rep. Betty McCollum). Discussions focused on PFAS, BABA requirements, and maintaining CWSRF funding. For staffers less familiar with PFAS and wastewater treatment, Sam and Ash discussed how public utilities support communities by protecting public and environmental health, and how land application of biosolids is the most sustainable recycling method. That helped demystify the knee-jerk concerns regarding biosolids when people learn about it for the first time. Sharing how public utilities care about the environment demonstrated how we are on the front line of these issues – and a partner in finding solutions.

Next year, AWWA will meet at the same time as WEF. WEF has coordinated with the water reps. in the past and will do the same in the future.

The meetings with legislative staff continue to be effective in advocating for water funding and workable policies and regulations. We urge members to become WEF Water Advocates to provide a voice as water issues arise. CS

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GWS Update

GLOBAL WATER STEWARDSHIP

By Joe Lapastora, GWS Co-Chair

Hola CSWEA colleagues! For those who have kept up with our quarterly GWS updates over the past few years, you may be in for a bit of a surprise seeing a different headshot and name attached to this article, rather than seeing Liz Heise. So, let's start there.

Liz Heise

GWS recently saw a leadership transition as our beloved chair, Liz Heise, officially passed the torch after leading our organization for the past three-and-a-half years. I'm not entirely certain Liz understood that she would be committing to a three-plus-year chair role when she stepped into the position back in 2019, but that is the great thing about Liz: her commitment to GWS and its growth/success is always one of her highest priorities. Simply put, Liz has led GWS through some of its most challenging years (including a worldwide pandemic) with a smile on her face and a go-getter attitude. Under her leadership, GWS experienced many firsts, including the introduction of our now annual efforts, TicoSan, Aguafest, and the knowledge exchange program. I would assume that many GWS volunteers share the same admiration for Liz as I do. She was/is one hell of a leader, who is always friendly, professional, and cordial through all her interactions. She routinely met and exceeded challenges and continues to be an inspiration to many YPs in our organization and within the water industry across the US. Liz has a very good reason for stepping down from the chair position at this time, as she and her husband, Jordan Heise, will be welcoming a kiddo to their team this summer!

Costa Rica Delegation at Kishwaukee WRD Tour.

Costa Rica Delegation at Glenbard Wastewater Authority.

We would be remiss to not thank Jordan for his unwavering support for our organization through the last few years – mostly for allowing us to consume a lot of Liz's time. So, with that I will leave everyone with the simple request: If you see Liz anytime in the near future, please be sure to thank her for all that she has done for GWS, and in turn, for CSWEA and WEF. Liz will continue to lead by example and will now focus primarily on researching and applying for grant and funding avenues.

With Liz's time as chair coming to an end, the reigns are now being handed off to two co-chairs (because she was truly doing the work of two people). In late 2022, I was asked to step into a co-chair role with Liz when she pitched the idea of spreading chair responsibilities across two co-chairs. I have unofficially been assisting with chair responsibilities since then. Fast forward to April 2023, and we decided to approach standout volunteer Sarah Guzman, who routinely demonstrates her passion and commitment to GWS. Sarah graciously accepted the invite and as of late May, we both officially assumed co-chair titles and responsibilities. We are both eager and excited to continue to build upon the success and growth that Liz, and all other past chairs, have accomplished.

And now it's time for some recent updates! Summer is always a busy time for GWS and its dedicated volunteers, and this summer is no different. Most of our efforts in the early summer months are spent on Service Trip planning and preparing a new Problem Statement for the GWS Category of the Midwest Student Design Competition (MSDC). The problem statement features a prompt to design a centralized wastewater treatment system and accompanying collection system for a Costa Rican community of choice.

This past April, GWS held its 3rd Annual Knowledge Exchange by hosting a Costa Rican delegation consisting of five students from Universidad de Costa Rica and two ASADA members from Bijagua, Costa Rica for a week-long stay in the US. GWS crafted the week-long stay for the delegation to participate in the regional Midwest Student Design Competition (MSDC), attend the CSWEA Education Seminar, visit multiple wastewater treatment facilities throughout Wisconsin and Illinois, and enjoy local tourist attractions while staying in the Madison and Chicago. This event continues to be a big hit and leaves a meaningful impact on the future engineers and implementers of future Costa Rican wastewater professionals! As delegation trip planner, I'd like to thank all the people and facilities that helped with the on the ground coordination of activities and tours for our Costa Rican friends. Without your help, this year's delegation trip would not have been possible. The delegation trip was a major success for both the visitors from Costa Rica as well as the individuals and facilities that were part of the collective effort. Toured facilities included Sun Prairie, WI WWTF, Sycamore WWTF, Kishwaukee WRD, Glenbard Wastewater Authority, Northern Moraine WRD, and Wheaton SD.

Costa Rica Delegation at Wheaton SD Tour.

Costa Rica Delegation at Chicago Bean.

Aside from our Community Design committee, summer is typically the calm time of the year for many of our other committees where they have the chance to catch their breath after wrapping up big-ticket events that occur over the Winter/Spring. The downtime is short lived as these committees pick up the pace shortly after the August Service Trip as they look to plan next year's event(s) including TicoSan, Aguapalooza, the knowledge exchange program, and various webinars.

Brandon Friedland at Aguafest.

Children enjoying activity at Aguafest.

Aguafest booth with student activity.

Our organization has seen tremendous growth as of late, and we have added some rockstar volunteers to our team. The new volunteer additions have come at a good time as we are consistently adding new events/activities to our annual cadence.

One recent rockstar volunteer addition to the GWS crew is certainly worth highlighting. Brandon Friedland is a Project Manager with Xylem who not only joined GWS in mid-2023, but boldly stepped into a committee chair role for the Public Education & Outreach committee. Brandon hit the ground running and led an effort to plan and organize the inaugural Aguafest this past March. Through the awesome efforts of Brandon and his committee, GWS hosted the educational festival for elementary kids in the community of La Fortuna, Costa Rica that was focused on teaching children about sanitation and the importance of clean water. The event was such a huge success that La Fortuna has asked us to return annually to host this community event.

"This year's event was a huge success as over 170 actively engaged professional engineers, vendors and students collaborated on how to progress sanitation efforts within their beautiful country."

Aguafest was held in conjunction with the 2nd Annual TicoSan Conference which is an annual seminar hosted by GWS in San Jose, Costa Rica. The conference hosts utility managers, plant operators, consulting engineers, technology providers, and students and covers technical presentations on wastewater technologies and resource recovery. The conference offers an opportunity for Costa Rican wastewater professionals to network with US wastewater companies and professionals and collaborate together on developing this new industry within Costa Rica. This year's event was a huge success as over 170 actively engaged professional engineers, vendors and students collaborated on how to progress sanitation efforts within their beautiful country. This event was organized and led by

Aerial of La Fortuna, Costa Rica during Aguafest.

TicoSan Audience.

a handful of volunteers including; Eider Alvarez Puras, María Alejandra González Malavasi, Guissel Davila, Sarah Guzman, Megan Livak, Laura Torres Corral, Mike Pepin, Brandon Friedland, Paulo Rodríguez, and Mohammed Haque. The TicoSan crew is enjoying the well deserved down-time before they dive into TicoSan 2024 planning in the very near future.

Another great volunteer addition from the past year is John Chlebeck from the Minnesota Metropolitan Council. John took on the lead role for organizing the GWS Silent Auction that is held every year at the CSWEA Annual Meeting. John worked extremely hard to find vendors and consultants to donate auction items and he played a huge part in our most successful silent auction to date with a total amount raised of $3,200! I would like to thank John and all vendors/firms/companies who donated goods and services that were used in the silent auction.

Speaking of fundraising, we are extremely happy to highlight the $5,000

TicoSan Exhibitor Hall.

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GWS Executive Director, Mohammed Haque with Keynote Speaker, Alejandro Guillén Guardia, Executive President of AyA.

grant that GWS was awarded from Xylem to help support the costs associated with the inaugural Aguafest. Our very own Brandon Friedland, Megan Livak, Sarah Guzman, and Liz Heise led the effort on completing the grant application. The grant was awarded in May to our surprise. Brandon and the rest of the team will look to build upon our recent success by submitting another grant application for the 3rd Annual TicoSan in the near future. From our volunteers, to the La Fortuna elementary students who reaped the benefits of Augafest this year, we sincerely thank Xylem for their support.

It's always exciting to review our recent highlights, but let's chat about what's on the horizon. We are quickly approaching the Annual Service Trip to Costa Rica as logistics and trip planning is fully underway. This year's trip is scheduled for August 20 to 27, 2023 and 14 volunteers are scheduled to attend, including the five team members from the Marquette University team who won the 2023 GWS Category of the MSDC. Similar to years past, we will have many Costa Rican GWS members also tag along throughout

TicoSan attendee gifts.

the trip. For the first half of the service trip, participants are scheduled to travel Horquetas, Costa Rica, which was recently announced as the 2024 GWS Community of Choice. As part of our visit to Horquetas, we will meet with members of Horquetas ASADA (Costa Rican equivalent of US Public Works), execute a Memo of Understanding, review the typical timeline of the student design competition and subsequent handoff of winning design documents, obtain topographical survey data and other useful information or data required for producing a meaningful Problem Statement, and then scout possible schools for next year's biogarden construction.

GWS will spend a total of three days in Horquetas before heading to Bijagua, Costa Rica, which was the 2023 Community of Choice. The group will spend the next three days in Bijagua, with the first day dedicated to meeting with members of Bijagua ASADA and Bijagua community members. The US winning design team, Marquette University, and the International winning design team, Universidad de Costa Rica, of the GWS category of the MSDC, will both present their team's designs to the ASADA members, interested community members, and project stakeholders. Both teams will then hand off all design documents and presentations for Bijagua ASADA members to use for project planning and future implementation. Other activities include constructing a biogarden to treat grey water and holding education activities at a Bijagua elementary school. The final day of our trip is dedicated for volunteers to return to San Jose for return flights.

I'd like to wrap up this article by making a small request to those who are reading to consider donating to our impactful organization. As one can see from this article, GWS works on numerous efforts to bring clean water and sanitation to Costa Rica with a focus on WASH education, and oftentimes the only thing that limits our success is funding. As a non-profit, the most common challenge we encounter is continuous funding. Everything that we do comes with an expense and you and/or your company can play a big part in helping GWS continue to accomplish our goals and bring clean water and sanitation to the global water environment. It's an exciting time to be a part of the organization. If you're interested in learning more or getting involved, reach out to *chair@globalwaterstewardship.org* to get plugged in! CS

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THE 4th ANNUAL MIDWEST STUDENT DESIGN COMPETITION

By Christine Hengel-Prom

The 4th Annual Midwest Student Design Competition (MSDC) was held on April 10, 2023 at the Monona Terrace in Madison, WI. The MSDC promotes "real world and hands on" design experience for students interested in pursuing an education or career in water/wastewater engineering and sciences field. Speaking as a previous competitor, this opportunity is career-defining and has made me a better engineer. The MSDC offers three competitions. Two are the Water Environment Federation (WEF) Wastewater Category and Water Environment Category. Winning teams from these categories are eligible to compete at WEFTEC in the fall. The third category is the Global Water Stewardship (GWS) Category, with the winning team receiving a trip to Costa Rica. We also had our 2nd Annual Career Fair, which gave students an opportunity to meet with potential employers.

Each WEF Member Association (MA) has the ability to send one team for each WEF competition. We have been expanding our competition to universities outside of the three CSWEA states over the past few years. We need permission from those MAs to enter our competition and we were able to, for the first time, get permission from six of the neighboring states. This year we hosted three different teams from two MAs. In future years, we are looking to expand our outreach efforts to more universities.

This year the MSDC hosted 11 design teams from eight universities in five states and Costa Rica.

Two teams from Iowa State University, representing the Iowa WEA, and one team Washington University, representing Missouri WEA, are eligible to compete at WEFTEC. Adding in the 2 CSWEA teams and the international team from Costa Rica, the total amount of teams eligible to compete at WEFTEC is six. I am so excited our efforts have doubled our impact from previous years. The WEFTEC competition is held the Sunday before WEFTEC so please support these teams and see their great work if you go early!

CATEGORY WINNERS

WEF Wastewater Category: Milwaukee School of Engineering

Team Members: Molly Stewart, Brigid Doyle, and Drew Esson

WEF Water Environment Category: University of Wisconsin – Madison

Team Members: Megan Beaulieu, Anna Cardinal, Josh Nesemer-Sher, Emily Strand, and Ethan Hanewall

Global Water Stewardship Overall: Marquette University

Team Members: Matt Cerven, Claire Connelly, Colton Herbert, Mia Ketelhohn, and Mackenzie Allen

Global Water Stewardship International: Universidad de Costa Rica

Team Members: Roberto Roldan Lopez, Sofia Abarca Rodriguez, Alejandro Rodriguez Vargas, Mauricio Alpizar Murillo, and Madison Arce Jimenez

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The teams that will be representing CSWEA at WEFTEC come from Milwaukee School of Engineering (Wastewater Category) and the University of Wisconsin-Madison (Wastewater Category).

Since CSWEA did not budget for any international participation at WEFTEC beyond what was budgeted for the two CSWEA teams who won the WEF categories, our committee will look to assist each team with seeking team sponsors to assist with and/or cover finances associated with travel and lodging to compete at WEFTEC.

After another successful year I would like to recognize few people and organizations that made the MSDC possible. First, thanks to the CSWEA Student Design Committee and GWS Community Design Committee folks for all of the time and effort throughout the last year. Specific individuals who deserve all the praise in the world include Joe Lapastora (my amazing co-chair) and Jonessa Ruhl (the GWS Design Competition Chair).

WEF Category Judges

GWS Judges

Thank you to all our judges: Emma Larson (City of St. Cloud), Greg Gunderson (MSA Professional Services), Anna Munson (Hazen and Sawyer), Amy Underwood (Downers Grove Sanitary District), Amanda Streicher (Baxter & Woodman), Joanie Hawley (Superior Engineering), Matt Streicher (Glenbard Wastewater Authority), Mario Gonzalez (ASADA representative).

Thank you to all our sponsors: Black & Veatch, Brown and Caldwell, Baxter & Woodman, Mulcahy Shaw Water, MSA Professional Services, and Strand Associates. Without these wonderful sponsors, CSWEA would not have been able to provide the necessary funding support required to attend the in-person competition.

Lastly, I would like to thank all of our students who competed in this year's competition. We were blown away by all of the talent on display and I mean this wholeheartedly, all employers should be linking up to hire these amazing students. Thanks to all those who played a part in this year's success, I look forward to continuing our success at next year's 5th Annual MSDC!

We are always looking for more help on the MSDC Committee. If you are interested, please reach out to Christine Hengel-Prom at *hengelpromc@bv.com* or Joe Lapastora, at *lapastora@nmwrd.org*. CS

If interested in international team sponsorship, and support student advancement within our industry, please reach out to CSWEA Student Design Competition Co-Chair Joe Lapastora at *lapastora@nmwrd.org*.

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MIDWEST STUDENT DESIGN WINNER

WEF WATER ENVIRONMENT CATEGORY: THE UNIVERSITY OF WISCONSIN – MADISON

WISCONSIN
UNIVERSITY OF WISCONSIN–MADISON

The University of Wisconsin – Madison Team Members (L-R): Anna Cardinal, Emily Strand, Joshua Nemser-Sher, and Megan Beaulieu

On April 10, 2023, 11 teams from eight universities competed in CSWEA's Midwest Student Design Competition (MSDC) at the Monona Terrace Convention Center in Madison, WI. The competition itself was broken down into three categories: Water Environment Federation (WEF) Wastewater, WEF Environmental, and Global Water Stewardship. The University of Wisconsin – Madison sent four undergraduate civil engineers to the competition to represent the university: Megan Beaulieu, Anna Cardinal, Joshua Nemser-Sher, and Emily Strand. The four recent graduates of the University of Wisconsin – Madison received their bachelor degrees in Civil Engineering in May 2023. They were all members of the same senior capstone design project, where they were introduced to the Koshkonong Creek Watershed, a watershed known for its frequent flooding. With Beaulieu focusing on Construction Management, Cardinal and Strand focusing on Environmental Engineering, and Nemser-Sher focusing on Civil Engineering Hydraulics, the team pulled their strengths together and created a unique design. They spent months brainstorming and developing ideas on how to reduce the flooding issues seen in Koshkonong Creek and once they found their proposed solution, they entered the MSDC in the WEF Water Environment Category and won first place.

CALL TO ACTION

Koshkonong Creek provides an important surface water resource for the communities of Cottage Grove, Deerfield, and the Friends of Koshkonong Creek, Inc. Over the past 50 years, annual flooding along Koshkonong Creek has increased, now resulting in a continuously flooded state during the spring season. This intense annual flooding causes substantial damage to nearby infrastructure and private properties, and the runoff from nearby farm fields increases phosphorus levels in Koshkonong Creek and Koshkonong Lake, which lies downstream of the creek. Additionally, the threat of flooding limits nearby farmers on crop selection, which has driven many of them to grow canary grass, an invasive species that threatens to strangle out native plants downstream. In response to these flooding events and the interests of the above-mentioned groups, Badger Farms LLC has volunteered their property to be reengineered to reduce the severity and duration of flooding events in the Koshkonong Creek Watershed. In addition to flood mitigation, Badger Farms also wishes to create a year-round water basin and park suitable for recreation.

OBJECTIVE

The team's goal was to evaluate, recommend, and design a system to reduce the duration and severity of annual flooding in the Koshkonong Creek Watershed and create a recreational reservoir for the community located on Badger Farms LLC in Deerfield, WI.

For this project to be deemed successful, the design had to decrease flood inundation along the main stem of the creek. The project was designed around reducing the annual flooding event severity, as discussions with community members indicated that these annual floods and their impacts were the primary concern. The design solution addresses the maintenance issues previously observed in the creek where trees, vegetation, and debris often build up. Additionally, designing a solution that requires minimal maintenance was an important parameter. Aside from creating a solution to the flooding events in Koshkonong Creek, adding a recreational area for the reservoir was of next importance. The client, Badger Farms, where the reservoir is located, emphasized a strong desire for having the solution bring the community together, having people use the reservoir and land around it recreationally.

CONSTRAINTS

Phosphorus levels, water temperature, and fish populations need to be considered to meet standard requirements and are crucial for the safety of the Koshkonong Creek Watershed and surrounding areas. High phosphorus levels are harmful because they can lead to eutrophication in lakes, which causes excessive growth of plants and large algae blooms. This can lead to degraded biological communities, low DO (dissolved oxygen), and water quality use restrictions. To manage the phosphorus in the recreational lake, tests will be conducted once the reservoir is dug, then treatment using ferric chloride will be administered before the recreational reservoir is open to the public. Water temperature is an environmental constraint, since adding a dam can raise water temperatures, which can cause harm for fish and wildlife. Thus, a solution that protects the wildlife of the creek while also keeping water temperature and phosphorus levels in mind is crucial for the success of the project. Regulatory restrictions set up by agencies like the DNR and the Town of Deerfield provide guidelines and regulations to ensure the implementation of this system is beneficial to the environment.

Addressing the communities' needs and concerns regarding the construction that will take place and working closely with the public to mitigate negative social impacts are critical to this project, as the Koshkonong Creek Watershed is used by the community. Most of the creek is extremely shallow, so swimming and boating are not common. A design goal is for the created reservoir to be used recreationally, with room to jet ski, boat, fish, and kayak, and thus these social constraints must be considered. There are many farms in the watershed in proximity to the project site, making it important to consider the way the project may impact the agriculture in the area. Travel cannot be impaired for community members since there is a main road, CTH BB, that separates the Koshkonong Creek from the land available for the flood control reservoir. The proposed location of the project will be near private land and homes, so noise and aesthetics also need to be considered when creating the embankment and reservoir.

CREATING A DESIGN

Initial design considerations included a dam/reservoir, a concrete lined channel, and an embankment/reservoir approach. Environmental concerns and safety concerns as mentioned above led to the team selecting an embankment and reservoir design approach solution. Next, the material for the embankment needed to be determined. The three alternatives are based on varying the material used for the design of the embankment while maintaining a two-tiered structure, with the lower opening accommodating the two-year flooding event and the upper opening accommodating larger flooding events. The embankment alternatives all contained compact earthen fill from the site for the base dimensions but are lined with different materials in areas that are designed to experience significant water flow to protect the embankment.

The first alternative includes an embankment with grouted riprap liner along the channel and backside of the embankment to minimize erosion. Grouted riprap consists of large aggregate material and grout to cement the aggregate together. This riprap minimizes embankment erosion that occurs during flooding events as it reduces the velocity of flood waters, protecting the earthen component of the embankment. The initial costs of this alternative are higher, as grouted riprap incurs material, construction, and implementation costs.

The second alternative includes an embankment with a loose riprap liner to reduce erosion. This embankment will have the same shape as the embankment shown above in Figure 4. Using riprap reduces erosion of the embankment that occurs during flooding events by reducing flow velocities, which can minimize future maintenance costs. This alternative will require increased maintenance relative to the grouted riprap option, as the loose riprap is more susceptible to displacement during flooding events. The third alternative is an earthen embankment without an additional liner. This earthen embankment is designed to mitigate flow into and out of the recreational lake. However, the flow rates over different parts of the embankment will be higher during flooding events, which may result in more erosion and require increased maintenance to maintain the storage capacity of the embankment. This alternative has reduced costs relative to alternatives 1 and 2, as this alternative does not require the purchase and transportation of additional materials.

Figure 2: Existing Flood Conditions on Farmland Bordering Koshkonong Creek.

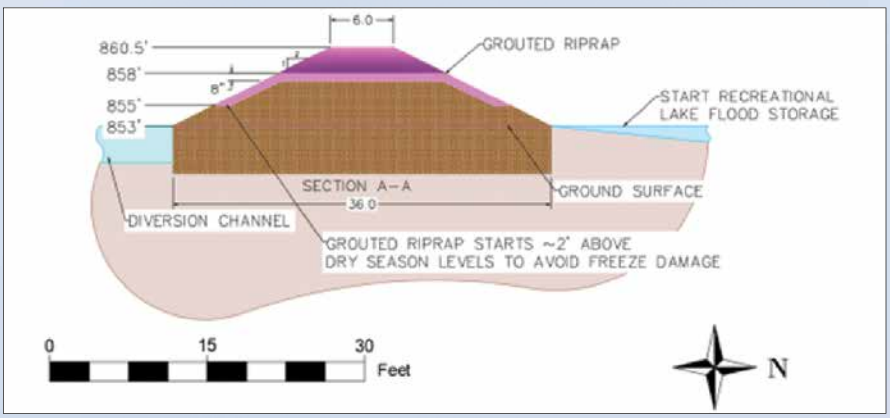

Figure 3: Proposed embankment layout for Koshkonong Creek flood control and recreational lake.

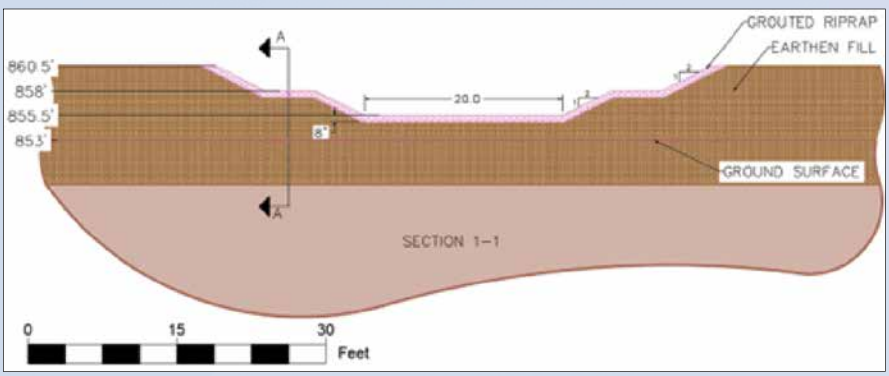

Figure 4: Proposed grouted riprap liner embankment layout for Koshkonong Creek Project.

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The team, with input from the client and professors, landed on using the grouted riprap alternative for the embankment that will lead to the recreational reservoir. When considering this decision, of paramount importance was the initial construction cost of the design, operation, and management costs for its service use, the projected time taken to construct each design alternative, and the potential environmental effect. It was found that grouted riprap was the most practical. While its immediate construction costs were higher, construction time longer, and environmental effect from the use of carbon dioxide greater than the other options, it was significantly more cost effective in the long-term when considering operation and maintenance cost. Ultimately the additional stability that concrete adds to the liner made for much lower projections of maintenance costs for erosion rehabilitation, leaving the group to select grouted riprap for the design.

FINAL DESIGN

The flood control system consists of three main components: a diversion channel, an embankment, and a flood basin. When increased water levels are present, the water from the Koshkonong creek will divert flow through the diversion channel, which will bring the water to the embankment and into the flood basin. The flood basin will have water in it year-round so activities like jet skiing, kayaking, and ice skating can take place. An island created from the cut of the flood basin will be created in request of the client to have a spot to kayak to and picnic. There will also be a disc golf course, parking lot, boat launch, and walking paths for the community to utilize and enjoy. A layout of the design is located in Figure 5.

Diversion Channel

The diversion channel will carry the flood flow to the embankment structure, as shown in Figure 5. There is an existing drainage channel that will be utilized and improved upon for diversion of greater flood flows than it currently carries. Areas of concern within this diversion channel will be lined with riprap where necessary to support larger flood flows than the existing stream handles. Additionally, lining embankments will be constructed along the edges of the diversion channel to contain flood flows of approximately 373 cubic feet per second in accordance with flood flow calculations performed. Figure 6 shows the design cross section of the diversion channel and lining embankments.

The elevations shown in Figure 6 indicate the elevations of the whole diversion channel, so the stream slope of the diversion channel will be 0, with the outer slopes of the embankment tying into the existing grade at the site. This diversion channel passes under CTH BB through an existing bridge culvert structure.

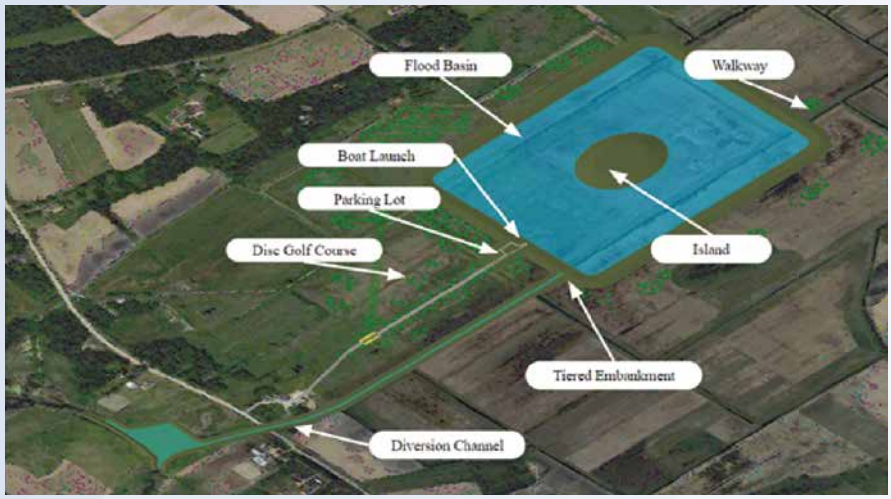

Figure 5: Overall site layout.

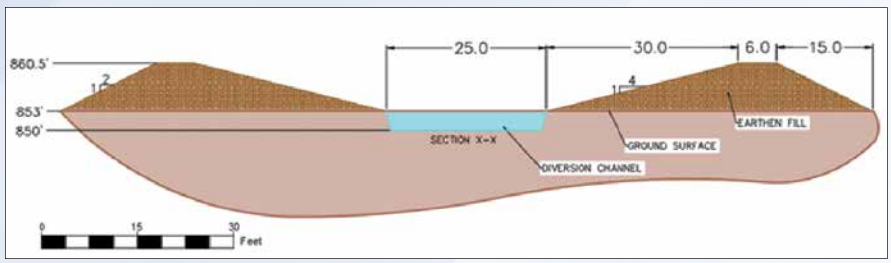

Figure 6: Cross section of diversion channel.

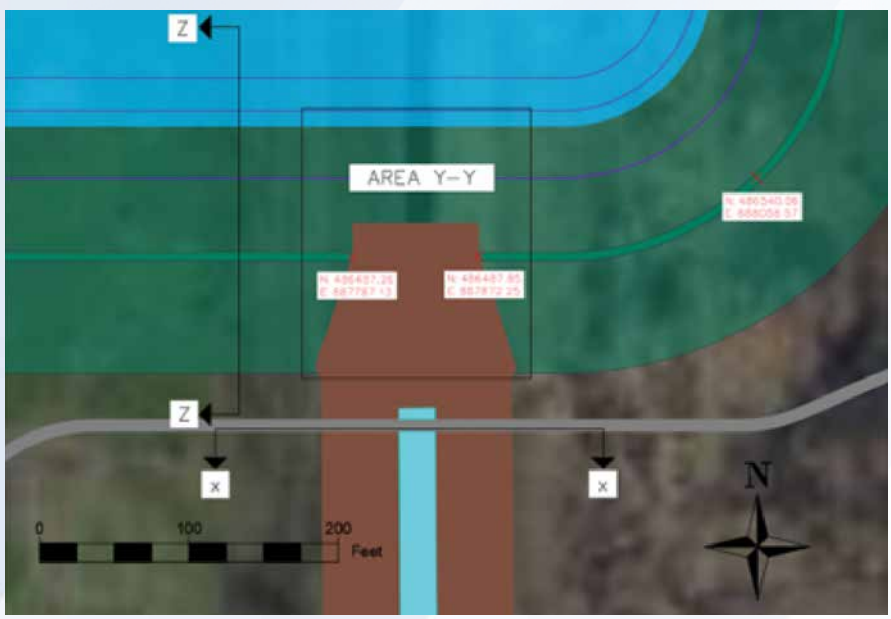

Figure 7: The cross section and area at the southern corner of the recreational lake.

Embankment

There are two embankment structure types at the site, the embankments lining the diversion channel and a tiered embankment, where the diversion channel meets the recreational lake.

The embankment lining the diversion channel and main stem of Koshkonong Creek will be constructed from the cut removed from the lake structure. The tiered embankment is located on the southern edge of the recreational lake where the diversion channel meets the lake, as shown in Figure 7, providing a point of visual interest from County Highway BB.

The embankment structures will tie into the berm surrounding the recreational lake, as shown from a top view and an isometric view in Figure 8.

This embankment will have an east to west length of around 84 feet and feature a two-tiered design in order to accommodate different flood intensities, as shown in Figure 9. The body of each embankment alternative will be constructed from earthen material.

The proposed embankment has a width of 36 feet, a height of 7.5 feet, and 2:1 side slopes, as shown in Figure 10. Geotechnical analysis confirmed that these side slopes will be stable.

The tiered embankment provides an intentional separation between Koshkonong Creek and the water in the recreational lake. Because this project centers on the main stem of Koshkonong Creek, it is important to the project to prevent negative impacts that the recreational lake could have on the creek. By using the embankment, backflow from the recreational lake to the main stem of the creek will be minimized, protecting the creek from potential contamination if the recreational lake were to face environmental issues. The embankments along the edges of the diversion channel and Koshkonong Creek will help to control the flood water and ensure the water moves through the diversion channel during flood events rather than overflowing.

Flood Basin and Recreational Area

The recreational lake will be constructed to a depth of approximately eight feet below the piezometric surface/groundwater table at the site, and thus will always have approximately eight feet of water available to recreational users of the lake, even in drier seasons. Groundwater flows towards the main stem of Koshkonong Creek under the existing conditions, and this project is not expected to dramatically change this flow pattern. The shoreline of the lake will include a berm built up to a height of 7.5 feet at a 10:1 slope with a total width of 156 feet, as shown in Figure 11, to augment the flood storage capacity of the lake and provide a safe recreational area for users of the lake. Because this site is in a flood plain, it is important to recognize that the permitting process for placing this berm is likely to be difficult. However, the increase in flood storage from the proposed lake is expected to offset the reductions in flood storage from constructing in this flood plain. The proposed lake will have a live storage capacity of approximately 500,000 cubic yards to accommodate the flow diverted from the main stem of Koshkonong Creek during two-year flood events.

The 10:1 slope ties into a 15:1 slope for the first 10 feet of width into the lake to improve the safety of the site by reducing the likelihood of slipping directly into the deep water, as well as protecting the shoreline from erosion by waves. The 15:1 slope then ties into a 3:1 slope to the bottom of the lake. The flood storage capacity of the lake has been designed to accommodate a two-year flooding event, and thus will help to mitigate the impacts of annual/approximately biannual flooding events. The lake also includes a recreational island near the center of the lake.

The proposed island will provide an inviting destination for recreational users of

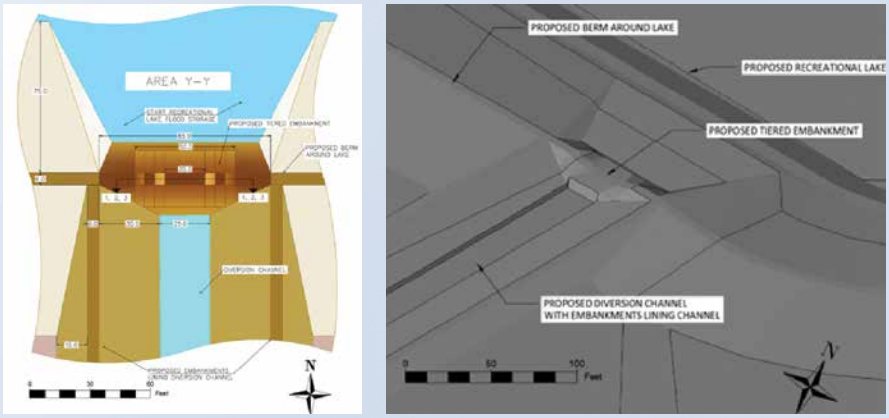

Figure 8: Area Y-Y showing the embankment tie-ins to lake berm from a top view and isometric view.

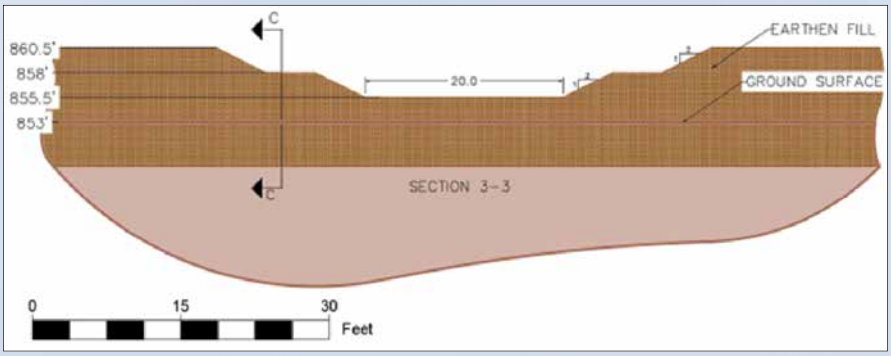

Figure 9: North elevation cross section 3-3 of embankment.

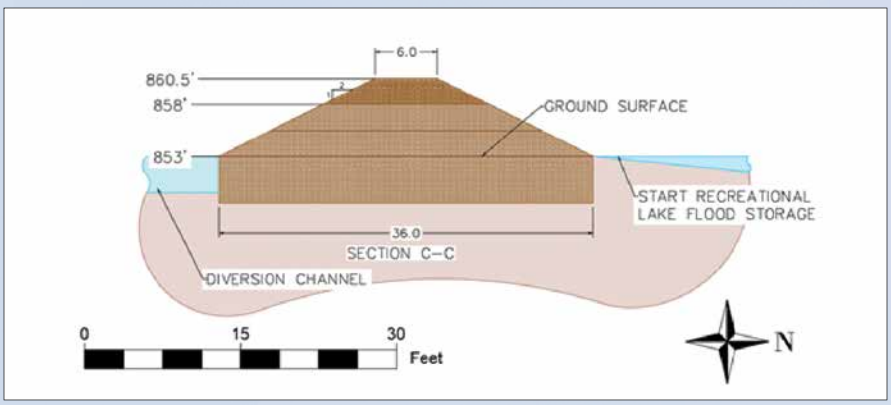

Figure 10: Cross section C-C of embankment.

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the lake and provide an opportunity to reuse some of the earth excavated from the lake. The available lake surface area will also be suitable for recreational skiing, as indicated by the 250' by 2000' stretch of deep water in Figure 12. The recreational aspects of this design will include a boat launch, walking path, pedestrian bridges, and two docks, as shown in Figure 12.

The recreational lake has a surface area of approximately 75 acres, and the island has a surface area of approximately seven acres. There will be around one million cubic yards of excavation to construct this lake, and that cut will be used to build the berm around the perimeter of the lake, the tiered embankment, the diversion channel embankments, the island, and other parts of the recreational area.

ENVIRONMENTAL ANALYSIS

A major consideration when creating the three alternatives was erosion of the embankment. Each material will experience a certain degree of erosion due to the velocity of the flood waters of roughly 7 feet per second, that come from the main stem of the creek as the water travels through the embankment to its final location, the recreational reservoir. Another environmental aspect addressed was the water quality of the current creek as well as the water quality of the proposed reservoir.

High phosphorus levels in this watershed are related to surface runoff and bank erosion. Fertilizer-rich runoff from farm areas is a large source of increased phosphorus levels. The design alternatives considered this and this is a major reason why the current runoff ditches in the area used by farmers and agriculture will not drain into the recreational lake. The rerouted locations of these channels will avoid draining into the flood basin. In 1986, the Environmental Protection Agency (EPA) established the following recommended criteria for phosphorus: No more than 0.1 mg/L for streams that do not empty into reservoirs; no more than 0.05 mg/L for streams discharging into reservoirs; and no more than 0.024 mg/L for reservoirs. Although testing for accurate phosphorus levels in the reservoir cannot be completed until the reservoir is dug, an estimate was used to determine how much phosphorus removal will be expected. By estimating conservatively, there will be more room in the budget if the actual phosphorus levels are lower. It was estimated that there was 0.076 mg/L of phosphorus that will be in the reservoir when it is initially constructed. Based on the EPA standard, a treatment goal of 0.024 mg/L will be used to properly treat the recreational reservoir. The phosphorus will be treated using a ferric chloride treatment.

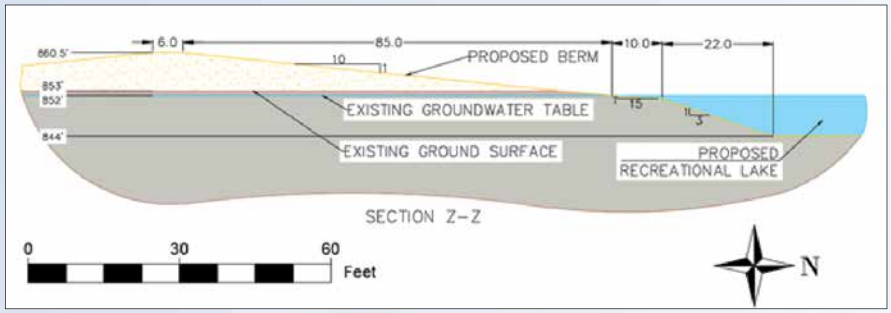

Figure 11: Shoreline slopes of the proposed recreational lake.

When creating the flow path design to get water from the main stem to the reservoir, reducing phosphorus movement from the basin into the main stem of the creek was necessary. Phosphorus movement is limited through the embankment structure, as it allows the lake to store potentially phosphorus rich flood water. The application of ferric chloride has been used in recent decades to remove phosphorus and treat lakes and reservoirs. Full Phosphorus testing and treatment at initial creation of the reservoir will be implemented, and additional testing and treatment should be completed every time a two-year and five-year flood occurs.

CONSTRUCTABILITY ANALYSIS

Construction of a project of this scale brings challenges. The site location at Badger Farms and the surrounding area are all in a wet, marshy floodplain. This means construction will be in the path of running/frozen water depending on the time of year. Winter excavation and temporary dewatering of the area will be required for safe construction. This extends the estimated schedule of the project and likely mean the project will take about a year to complete. Much of the excavated soil will be peat, which can be sold and removed from the property. Most of the remaining excavated soil is to be reused into project components like the berms, island feature, and embankment. This helps to greatly reduce the costs associated with removing soil off of the site.

CONCLUSION

After researching approaches to mitigate flooding in comparable watersheds to the Koshkonong Creek watershed, it was determined that a diversion channel, embankment, and recreational lake system with a recreational area is the appropriate design approach. Due to an increase of inflow from residential sources and climate change, the embankment would most effectively serve the community by allowing more frequent flood events to fill the reservoir which is why the embankment has been designed to accommodate two-year floods. In more severe flood events, the system will be overtopped and intensity of flooding in the area will be reduced through the storage provided by the recreational lake, but not fully eliminated. Because the embankment will experience severe weather and flood events, selecting the right material for the lining of the embankment is critical to its success. After careful analysis, the grouted riprap alternative was found to be the recommended alternative for the embankment, primarily due to its durability. While the initial construction costs are slightly higher, the grouted riprap provides the necessary assurance for the stability of the embankment during and after flood events, resulting in the lowest maintenance costs. CS

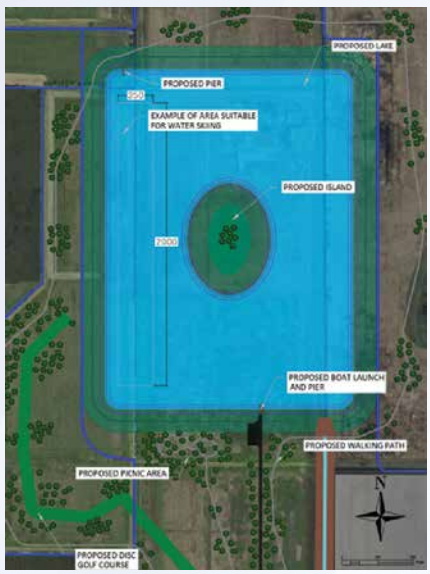

Figure 12: Proposed recreational lake and recreational area.

JULY 26

2023 CSWEA/IAFSM 3-DAY PCSWMM TRAINING COURSE
Chandler's Chophouse | Schaumburg, IL

JULY 27

WI SECTION 2023 NORTHWOODS COLLECTION SYSTEM SEMINAR
Eagles Club | Marshfield, WI

AUGUST 2

CSWEA/WIAWWA 2023 MANAGEMENT SEMINAR – LEADERSHIP IDEAS AND INSPIRATION
Hilton Garden Inn | Milwaukee, WI

WI SECTION 2023 INDUSTRIAL PRETREATMENT SEMINAR
Fox Cities Exhibition Center | Appleton, WI

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2023 WATER'S WORTH IT ESSAY CONTEST WINNERS

RESEARCH CATEGORY

Northern Illinois (1st Place - State of Illinois)

Kaitlyn Phan, 14, Libertyville, IL

Kaitlyn's favorite school subject is language arts. She enjoys walking, tennis, running, writing, and journaling. Kaitlyn's favorite way to enjoy clean water is cooking and baking.

KAITLYN'S ESSAY

The *Clean Water Act*: Protecting America's Water Resources

The *Clean Water Act* (CWA) is one of the most significant environmental laws in the US. Enacted in 1972, the CWA regulates the discharge of pollutants into the nation's waters, including rivers, lakes, and wetlands. The CWA has been an essential key to improving water quality and protecting the health of aquatic ecosystems.

Prior to the CWA, the amount of pollution in our nation's waterways was shocking and grotesque. Industrial facilities, sewage treatment plants, and other sources released pollutants directly into US rivers, lakes, and streams, resulting in poor water quality and harm to aquatic life. The CWA was set forth in response to growing public concern about the impacts of water pollution on human health and the environment.

The *Clean Water Act* authorizes the Environmental Protection Agency (EPA) to establish water quality standards for all surface waters, and to regulate the discharge of pollutants from point sources, such as factories and sewage treatment plants, through the National Pollutant Discharge Elimination System (NPDES) program. It also monitors other sources of pollution. An example of that would be agricultural runoff, which is water runoff from farm fields that can bring soil, fertilizer and other pollutants into our surface waters.

On a more personal level, the *Clean Water Act* has changed the lives of Illinois residents. The CWA has altered Illinois legislation for the better, and here's how: the CWA has helped to improve the quality of Illinois' water resources, including Lake Michigan, the Illinois River, and other rivers and streams throughout the state. The law has reduced the amount of pollutants that are discharged into these waters, leading to improvements in water clarity, the health of aquatic ecosystems, and the safety of water activities such as boating and swimming.

On October 18, 2023, the CWA hit its 51st year anniversary. What has CWA changed since then? Since its enactment, the CWA has had a significant impact on water quality in the US. The law has reduced the amount of pollutants discharged into the nation's waters, resulting in exceptional water quality and aquatic animal health. The EPA estimates that the *Clean Water Act* has prevented over 1.2 trillion pounds of pollutants from entering the nation's waters since its enactment. The law has also played a key role in the restoration of water bodies that were previously considered too polluted for swimming, fishing, or other recreational activities. CWA has raised and set the bar for nationwide wastewater standards, helped pay for sewage treatment plants, and required permits for point-source pollution discharges into navigable waters. This act has done numerous more things, and is overall a great success.

However, with all successes come downsides. The CWA faces several challenges. One of the primary challenges is the regulation of nonpoint source pollution, which can be difficult to control due to the diffuse nature of the sources. The implementation of good management practices and other measures can be costly and time-consuming for farmers and other landowners. Additionally, the CWA has faced political opposition from industries and other groups that argue that the law imposes undue regulatory burdens. In the future, the CWA should work on work to address more recent concerns. As the act was passed in 1972, it fails to address many more recent, and incredibly dangerous, threats to our nation's surface waters. Emerging contaminants such as microplastics are toxic to aquatic ecosystems and need to be regulated and handled.

In closing, the *Clean Water Act* has been a critical tool in protecting America's water resources. This law has been the first step to saving our environment, before it is too late. Without the CWA, our nation's surface waters would be far too polluted, and many people and aquatic animals would face severe consequences for it.

RESEARCH CATEGORY

Central Illinois

David Johnson, 13, Washington, IL

David's favorite subject in school is history. In his free time, David enjoys playing baseball, collecting baseball cards, biking, and reading. David's favorite ways to enjoy water are swimming, tubing, and boating at his aunt's lake house!

DAVID'S ESSAY

Protecting Our Water

Your favorite fishing spot could be polluted if it weren't for the *Clean Water Act* (CWA). The CWA was made to defend our nations' waters from pollution. The National Wildlife Federation states, "Congress passed the *Clean Water Act* in 1972 to protect all "waters of the United States." The CWA has significantly helped protect the water in the US from pollutants.

The CWA was created after the Cuyahoga River caught on fire in 1969. "In 1969 Ohio's Cuyahoga River was so fouled by industrial pollution that the river caught on fire. Public outcry over dirty rivers spurred Congress to pass the landmark *Clean Water Act* in 1972." (American Rivers). This Act became one of the most influential involving the environment.

The *Clean Water Act* has helped the country in many ways. The CWA keeps tons of pollutants out of rivers and streams. "It keeps 700 billion pounds of pollutants out of our waters annually..." (The National Wildlife Federation). The CWA also has slowed the rates of lost wetlands and has doubled the amount of water that is safe for swimming. Not only the environment, but the wildlife has profited from the *Clean Water Act*, too. The National Wildlife Federation says, "As water quality improved, fish species rebounded in damaged systems across the country." The *Clean Water Act*, however, has a weakness. The *Clean Water Act* targets "point sources." Point sources are identifiable causes of pollution and come from a single place. Examples of point-sources are factories, smokestacks, discharge pipes, drainage ditches, and wastewater treatment plants. The problem is the nonpoint-sources. Nonpoint-source pollution is harder to identify and harder to address. "It is pollution that comes from many places, all at once." (National Geographic Society). Nonpoint-sources can happen when rain and snow pick up pollutants coming from city streets, farmlands, and abandoned mines.

Illinois has done well under the *Clean Water Act*. Illinois has a plentiful amount of water. "Illinois has abundant water resources: there are over 119,000 miles of streams within Illinois, which borders 900 miles of large rivers form our western, eastern, and southern borders; there are more than 91,000 freshwater lakes and ponds in Illinois; and Illinois has jurisdiction over more than 1,500 square miles of open water in Lake Michigan." (Illinois Environmental Council). Illinois' water quality is also fine. The Illinois Environmental Council says, "With such an abundance of resources it is easy to take our clean water for granted, making it all the more important that we remember the availability and quality of our water resources is of great importance at the state, regional, and national levels." This quote reminds us that we need to use water for the greater good, and to conserve it as much as we can.

The CWA is ultimately helping keep our waters clean. The act has done its job in helping water cleanliness become more common in the United States. The CWA has made plenty of good impacts on water to make more of it safe for swimming and wildlife. Even though the Act has a weakness in the non-point source pollutants, the Act has helped immensely. Will you help keep the earths' water clean?

RESEARCH CATEGORY

Southern Illinois

Lily Starek, 14, Waterloo , IL

Lily's favorite subject in school is science. Her hobbies include art, horseback riding, and running. Lily says her favorite way to enjoy clean water is swimming in the river.

LILY'S ESSAY

How the *Clean Water Act* Changed Lives

The *Clean Water Act* is an organization that does not get enough recognition. This organization makes our water safe to drink, swim, and bathe in. Without this act, life in America would be unpredictable as well as a drastic change to our ordinary days.

On June 22, 1969 the Cuyahoga River Fire occurred. The Cuyahoga River Fire was a wake-up call to the nation's awareness of the safety and peril of our water pollution rate. The Cuyahoga River has caught flames many times, but was neglected until then. Pieces of oil dipped debris floated in the river, yet the people's industry was thriving. The fire was over five stories high and lasted roughly 30 minutes before

being extinguished by battalions and the city's fire boats. The Norfolk & Western Railway Co. underwent $45,000 in damage to the bridge; they were soon forced to shut down. The Cuyahoga River Fire was the final stroke for citizens to realize the urgency of establishing a solution.

A few years before the fire, John Bird published an article, Our Dying Waters, on April 23, 1966. This article highlights how we have destroyed our natural resources "fouled and degraded our beautiful waters." (Bird, para 2). Bird states how we have been given clean healthy waters, yet show our generosity by polluting our water sources and endangering our animals. He tells how we have been given nature and beauty, yet we make landfills on the earth to fill with our waste.

These examples show what our water and life was like before the *Clean Water Act*. The CWA has changed and benefited the health and cleanliness of our waters by keeping 700 billion pounds of trash and pollution out of our water per year! They have made it unlawful to pollute our waters, and attained an organization that has ensured the safety of many generations. The *Clean Water Act* has doubled the amount of water that is safe to swim and fish in; benefiting the lives of all civilians, and helping many endangered animals thrive once again.

The *Clean Water Act* is the reason we're able to accomplish daily essentials without the stress of chemicals and waste infiltrating our waters. The pollution rate has gone down drastically, considering it has only been active for 50 years; furthermore, life would be so much different if we didn't have the CWA to rely on. Successes that were not possible without the CWA include keeping billions of [tons of] trash and pollution out of our water every year, keeping our natural and man-made water sources clean, and keeping fishing and swimming a possibility.

Although the CWA has many accomplishments, some people say that it has failed to support urban waterways and isn't current with climate changes. A solution to these issues is to set up a smaller program to focus on the smaller/urban water sources, along with creating a locally run program to alert the CWA when they feel their waters need to be tended. The CWA does not get enough funding to fully solve every citizen's needs. There are many things that locals can do to clean up their waters like starting small groups to go down to rivers and ponds and cleaning up the trash in the water.

We need the CWA to protect our water resources and keep on ensuring that we never make the mistakes that caused things like the fire of the Cuyahoga River to happen again. We are able to safely swim in our rivers and have our family-owned waters be safe and pollution free. We can have disease free fish and animals thanks to the CWA. Our towns, counties, and states have beautiful ponds and water sources in them that aren't filled with trash and cans because of the efforts of the CWA.

None of these amazing things would be possible without the CWA. Many people don't realize the importance of this legislation and how different life would be without it. The *Clean Water Act* is something that needs to be enforced for so many reasons and should be more known.

CREATIVE WRITING CATEGORY

Northern Illinois (1st Place - State of Illinois)
Akshay Jaladi, 14, Lake Bluff, IL

Akshay's favorite school subjects are social studies and English language arts. He enjoys writing, hanging out with friends, and playing video games. Akshay says his favorite way to enjoy clean water is drinking it.

AKSHAY'S ESSAY

A Murky, Muddled Life

I blinked my eyes rapidly, still tired and not fully ready to wake up. I rolled over, my blanket swaddling me and providing warmth as I checked the time. 6:27 am. As usual, I was not in the mood to go to band this early. But I had to get over it. I shrugged off the warm comforter and walked to the bathroom.

I absentmindedly turned on the sink and saw a myriad of colors ooze out the tap, from the sickest shade of green to the murkiest brown. I inwardly puked, even though I knew I should be used to it by now. It made the majority of the public sick to their stomachs when they saw it, but it still didn't stop businesses and ordinary people from throwing their crap into Lake Michigan. I'd heard fairytales of a time when people could freely drink water, without getting violently ill or contracting a harmful disease. It made me laugh because there was no way they could be true.

I brushed my teeth, skipped the water, and considered taking a shower. I had just taken one yesterday, and while it was supposed to help us feel clean, it made me feel so dirty and miserable being covered in black sludge. So, I decided to skip [it] today, awkwardly wiping my face with a cleaning wipe.

I headed downstairs, wondering what was for breakfast. Probably some milk-based food. The milk quality was only somewhat decent, as the cows had to drink the same crummy water we had to. It was nightmarish. Turns out, my hunch was right. I gulped it down, trying not to focus on the horrible taste that flooded my mouth. After nearly choking on the flavor, I walked over to the door, looking at my phone. The news was playing and I saw headlines.

Riots break out over "Godsend Water Purifier." Mall Brawl and Store Slams frequent!

Another one? I rolled my eyes inwardly as I grabbed my bag, computer, and clarinet, stowed them in the back, and got into the shotgun seat of my dad's car. Heading out of the garage, I took in the world around me, as I had done so many times before. The small pond next to the exit of the neighborhood had a noxious green to it, covered with toxic algae. I heard in history class that ponds like this used to be beautiful and flowing, but now it's just depressing.

We passed signs for various water treatment products and water alternatives. They were all scams and hacks, but people have gotten so desperate for clean drinking water that they were falling for this. It makes people filthy rich but not rich enough to make a change in the government. There were also propaganda posters on buildings and

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stores, showing pictures of people convulsing violently after they had finished simply bathing or taking a drink of water from a fountain. Behind them lay a dark black puddle, which I knew to be oil.

I didn't even have to see the propaganda to be reminded of the dangers of simply drinking water. Several friends of mine have fallen ill with Hepatitis A, typhoid, and many other diseases. Adults have tried following tall tales and rumors of an oasis with unspoiled water, but here in the US, all of those were lies. Even worldwide no such oasis could ever exist with all the pollution and carelessness. Death tolls had been clocking in at record numbers in recent times.

"WE DEMAND CLEAN WATER! PLEASE LISTEN TO OUR CRIES! WE WANT THE BEST FOR US ALL!" I looked out the window and saw people wearing masks, protesting outside city hall. They were of all ages, from tiny toddlers who could barely talk to ancient adults who could barely walk, they were all unified in their pursuit of healthy water. But our local governments couldn't do anything, no matter how hard they tried. It went all the way up to the president, but they couldn't be bothered to do anything. They would have to fight the huge companies, who would easily make them lose mountains of profits. So, people were fighting in vain sadly.

We pulled into the school's parking lot, and my dad turned to me. "Remember, do not under any circumstances, drink the water from the fountains."

"Yes, I know, I remember," I said. Honestly, I was better off swallowing my saliva than drinking that water. I grabbed my stuff and waved goodbye to my dad.

From that point on, school mostly went off without a hitch. We learned more about the usual, and at lunch we choked down our waterless "food," ending the day watching more protesters and riots on the news. Just wishing we could do something to make a worthwhile change.

CREATIVE WRITING CATEGORY

Central Illinois

Adhrut Kulkarni, 13, Bloomington, IL

Adhrut's favorite school subject is math. In his free time, Adhrut enjoys reading, building Legos, and animating. Adhrut says he "love[s] the taste of water on a hot summer day!"

ADHRUT'S ESSAY

My Life Without Clean Water

There are three things every living being needs to survive: healthy food, shelter, and clean water. Without these things, I wouldn't exist. I can survive indefinitely without shelter and two weeks without food, but if faced with a drought, I would succumb to dehydration within a week. Water is the most important of these resources, so it's no wonder the *Clean Water Act* was one of the first environmental laws enacted by the US. Most of the time, however, I take this law for granted. What would happen if the *Clean Water Act* was never passed? Just how different would my life be?

I use water at home in two main ways; to drink and cook food, as well as to bathe and clean myself. Without the *Clean Water Act*, these basic components of my life would be thrown out the window. My faucet water would be filled with dirt and pollutants, making it impossible to use anywhere without a complex, time-consuming, and expensive filtering process that most families (including mine) could probably not afford. Instead, I would resort to buying water from corporations with the machinery necessary to clean water. Having a monopoly on the water market, these companies would be able to charge exorbitant prices that would put a serious strain on my family's savings. Even after all of this, a large portion of the filtered water would be unfit for human use and would simply be thrown out. This reintroduction of pollutants into my surroundings would make matters even worse.

Outside of my home, the situation would be even worse. The pollutants in the lakes and rivers in my town would be carried away by the water when it evaporated, returning as acid rain and other dangerous weather events. The acid rain would eat away at the buildings and other structures in my town. Bridges and buildings would collapse, and roads would fill with potholes. Schools, libraries, and restaurants would be abandoned, and only the hardiest above-ground structures would survive. Everyone in town would have to buy special, acid-proof materials to cover their house. I would be unable to travel, visit my friends and family, or go outside my home at all. The once-paradise of parks and wildlife would be marred by the chemicals in the water supply. The fauna that once frolicked in my local zoo would have long since died of poisoned water. There would be no more squirrels, crows, or trees outside my front door. Even if I somehow managed to get out of the country, I would not be free of the effects of water pollution. All countries on Earth would be affected by the lack of pollution control in America to some degree. Pollution would leak into the oceans and make its way to South America, Europe, Africa, Asia, Australia, and Antarctica. People from all continents would have to pitch in to solve the problem.

There would be no more sports or entertainment channels when I turn on the television. The only thing being discussed on the news would be the water crisis. Everyone would agree that water pollution is ruining the world, but no one would agree on what to do about it. Some people would think we need to enact more anti-pollution laws, while others would think they would stop our factories from producing the goods we need. With enough effort, we could undo humanity's effects on the planet, but to do that, we would need to work together.

Without the *Clean Water Act*, Earth would be a much darker place. Luckily, we saw pollution before it was too late and put many laws into place to keep it in check. This, however, is not enough. Without the help of every person on the planet, we cannot keep Earth a safe place to live. With enough people, though, we could turn the tide against pollution. There is still hope for humanity, but this wouldn't be the case without the groundbreaking *Clean Water Act*.

CREATIVE WRITING CATEGORY

Southern Illinois

Taylor Stady, 13, O'Fallon, IL

Taylor's favorite school subject is literature. Her hobbies include dancing, reading, writing, and sleeping. Taylor's favorite ways to enjoy clean water is drinking an ice-cold water, swimming in the ocean, and studying marine life.

TAYLOR'S ESSAY

The Water Will Run Dry

I stand in the kitchen, preparing genetically modified greens for tonight's supper. I press the plunger on the huge water recycler that is embedded in the wall between our kitchen and bathroom. A trickle of water squeezes out into the bowl.

I glance out the window. A forest fire rages in the distance and I cough when smog floats through the door as it's opened.

"Shut the door, shut the door!" I cry in between coughs. My little brother, Sekani, hurries to swing it closed between the bags he is carrying. I rush over and do it for him.

"Thanks," he says. He places the brown paper bags on the table, removes his paper mask, and fishes out two huge jugs of water. "These are the backup jugs for the filter," he said. Once a month, we have to add clean water to the filter just to help it move along.

I inspect the water. Tiny particles of dirt and dust float around, almost too miniscule to take note of. "This water isn't clean."

"I know, but with the acid rain going on in Massachusetts this is all they can spare. They're saying that the rain there is the worst it's been, ever. Hundreds of people have been killed." I look at the water once more, wishing that I could use it, but I can't.

"We can't use this, Sekani."

"The neighbors are."

"What neighbors? We live too close to the Flaming River for anyone else to risk coming here." I glance outside again. Through the smog and grime on the window, the orange lights of the forest fire glow in the distance, no doubt caused by the infamous Flaming River. It catches on fire due to pollution often.

"The ones that live a few miles away. The Robinsons. They say that they're going to use the water anyway. Their filter is on its last leg. Could we give them some of our own water?" My face hardens.

"No way. We need that water." I cross back over to the kitchen and set down the bowl of vegetables I hadn't realized I was still holding, and pulled our supper mash out of the radiator cooker. The bubbling, brown mush sizzles and pops as I set it on the counter to cool. "But you can give them the backup jugs. We're not going to use them. I don't want us to get sick, you know it will happen." I cough again, and my eyes water.

The smog is really bad today.

"Fine," Sekani says, and takes the jugs. He hooks the straps of his mask on his ears but doesn't put it on. "Be back soon!" He saunters out the door, closing it silently.

"Be careful!" I try to yell, but it comes out as a raspy whisper. I press my face to the window and watch him run towards the hill to go to the Robinsons' house, but stumbles as the weight of the water jugs drag him down. He falls and stays on the ground, unmoving. "Sekani!"

I grab a mask of my own, cover my face, and rush outside. The smog clings to my body and clothes like a ghost, grabbing me. I clear my throat and, through the haze, see him lying on the ground. I rushed over to him. He was having a coughing fit.

As the coughing subsides, I instruct him to get back in the house. I can feel the heat from the fire on my face, so close it feels like it is searing my skin off. We get back inside the house, and I shut the door tight to keep out the smog. Then, I throw sheets over the window and stuff them under the cracks between the door and the doorframe.

"We have to keep all the smog out," I tell Sekani. He coughs and gives a thumbs-up, then grabs all our towels and helps me seal up any last pockets of space between us and the outside world. He started coughing again, and asked for some water, which I reluctantly gave to him. Our filter only had a few days of water left.

We eat dinner and go to bed as the roar of the fire lights up the night, hoping that some miracle will come. Because sooner or later, the water will run dry and so will we.

CREATIVE WRITING CATEGORY

Wisconsin

Nora Buisch, 12, Racine, WI

Nora is a 12-year-old homeschool student from Racine, WI, who loves cats, guinea pigs, reading, writing, and doing anything that involves art and creativity. She also loves performing with local theater group, NYT. When Nora is older, she would love to be an artist or an author, so she is very thankful for this opportunity.

NORA'S ESSAY

From Everything to Nothing

How did we get here? We have no clean water. Why didn't anyone stop it? I'm Nora, and I'm 80 years old, looking back on my childhood. I lived on a big, colorful farm in Wisconsin near Lake Michigan. We had many animals such as horses, sheep, goats, chickens, cows, and barn cats. My favorite barn cat was named Sunny. She was my favorite because she was always so mellow, and I could take her along with me everywhere. Another fun thing that we had on our farm was a flower garden. We had lilies, sunflowers, poppies, daffodils, and daisies which all had many colors. I loved spring and summer because that's when the flowers started to bloom so beautifully. The farm was fun, but a lot of work. Thankfully, our crops and animals were always healthy, because the water we used was clean. Unfortunately, things have slowly changed.

Over time, people have become more reckless and indolent by dumping waste into our lakes and oceans. Factories spew toxic and hazardous chemicals into our water, which not only affects us, but the creatures in the water. Along with hazardous chemicals, we are also dumping oils, sewage, and other trash such as plastic bags and bottles into the water. If it's a hot day and you need to cool off in either Lake Michigan or in a pool and the water is polluted, then the conditions are too dangerous to swim in. Our beautiful lake is ruined!

We are now drinking water with bacteria in it. Because of that, more people and animals are getting sick, and even the soil is polluted. That means no gorgeous flowers or healthy crops. To make things worse, farmers are now spraying toxic pesticides on our plants to keep the bugs off, but instead, it makes the food even worse.

Things are dying slowly. Now, nature looks gloomy and depressed. Because of that, no one plants flowers because they're afraid that the feeble plants will just die off. Nature looks like an empty pot, waiting to be filled. Diseases are spreading, and people are becoming less healthy and more dehydrated. As I look back on my life when we had clean water, it makes me realize that the world today is massively different. If the water that animals and plants feed off of is polluted, that means that people will be eating dangerously unhealthy food. So then we could get sick, and nobody wants that. I hope my kids and grandkids will be able to have a good life with vibrant meadows of flowers and heathy water for when they're thirsty. This can only happen if everybody can team up together to clean the water and stop pollution. With clean and purified water, we would have better food, better water, and most importantly, a better life.

RESEARCH CATEGORY

Wisconsin

Paarth Gupta, Pilgrim Park Middle School, Elm Grove, WI

Paarth is in 8th Grade and enjoys playing chess, soccer, and cricket. He likes reading about history and sci-fi.

PAARTH'S ESSAY

The *Clean Water Act* and US Water

Water pollution has become an increasingly problematic issue due to the harm it causes to the invaluable resource of water. The *Federal Water Pollution Control Act* of 1948 was the first major federal US law to address the problem of water pollution. This was later expanded in 1972 through the *Clean Water Act* (CWA) due to growing public awareness and concern on the issue of water pollution and dirty rivers from industrial pollution which had become a serious problem in the mid-twentieth century due to rapid industrialization and population growth. Before the CWA, cities commonly dumped waste and trash into America's rivers, lakes, streams, and oceans. According to *www.nwf.org*, "Nearly half a million acres of wetlands were lost annually and by the mid-1980s, more than half the nation's total wetlands were lost."

The CWA aims to protect and restore the physical, chemical, and biological integrity of the nation's waters and prevent and manage the chemical, nutrient, pathogen, sediment, and thermal pollution that harms these waters. This resulted in the CWA establishing the basic structure for regulating pollutant discharges into the waters of

the US, making it unlawful to discharge any point source pollutants into navigable waters without a permit (according to the National Pollutant Discharge Elimination System [NPDES] in the CWA) from the Environmental Protection Agency (EPA) or an authorized state agency, in hope of restoring the physical, chemical and biological integrity of our waters. The permits set limits on the number of pollutants that can be discharged which are regularly monitored and reported to ensure compliance. Speaking of the EPA, they have implemented pollution control programs such as setting wastewater standards for industries and developed national water quality criteria recommendations for pollutants in surface waters.

Since its enactment, the CWA has led to significant improvements in the quality of US waters. For example, the number of water bodies that meet the water quality standards set by the EPA has greatly increased, and levels of pollutants such as fecal coliform bacteria, nitrogen, algae, and phosphorus have decreased. Not only that, but the CWA has brought our waters back to life, turning rivers and lakes from dumping grounds into productive and healthy waterways. The CWA also keeps 700 billion pounds of pollutants out of our waters annually, has slowed the rate of wetland loss, and doubled the number of waters that are safe for fishing and swimming, greatly benefiting the wildlife and the communities in the regions.

Additionally, the CWA has led to the cleanup and restoration of several polluted waters, such as the Chesapeake Bay and the Great Lakes thanks to the construction of multiple nationwide municipal wastewater treatment plants, which treat and discharge millions of gallons of wastewater every day. In fact, according to the EPA, the percentage of assessed waters that meet water quality standards has increased from 36% in 1972 to 60% in 2010. The CWA has also helped to prevent oil spills and other catastrophic events in the beautiful waters of our nation.

Overall, the CWA has been an instrumental tool in protecting and improving the quality of US waters over the past 50 years which has resulted in a lot cleaner water nationwide. While the results are clearly positive, efforts are needed to ensure the sustainability of the nation's water resources and our own welfare in the coming decades of our great nation. CS

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