Breakout Session 1	
Room #1	
Presenter #1:	Terry Tevera, P.E. (Ruekert & Mielke, Inc.)
Title:	Restoration of the Honey Creek Headwaters - A Habitat Restoration and Community Engagement Project
Abstract:	The Honey Creek headwaters, an urbanized and publicly accessible 0.92-mile reach in the City of Greenfield, have historically contributed to the degraded listing status and poor ecological condition of the entire watershed. While the Creek's riparian corridor is generally intact, the functional quality of its emergent and forested wetland communities is low. Restoration of the Honey Creek headwaters commenced in September 2022. The outcomes of the Honey Creek Restoration Project include 1.2 acres of vegetative thatch and sediment removal from the main channel bed and bank; 1.2 acres of stabilized/naturalized banks; Restoration of the hydrological connection to 6.36 acres of riparian floodplain (including a 4.82-acre meandering stream with companion riparian meadow); Restoration of stream form, function, and sinuosity that will enhance dissolved oxygen and provide fish spawning habitat; Addition of 2,302,000 gallons of stormwater storage through the installation of a water quality/flood retention facility; Creation or improvement of 7.6 acres of neighborhood green space (within Konkel Park); Increased access to community members, local groups, residents and technical professionals through designed open areas, paths, and a boardwalk trail system. This project will result in measurable, long-term and sustainable improvements to total phosphorous and total suspended sediment introduced into Honey Creek.

Presenter #2:	Mark Mittag (Milwaukee Metropolitan Sewerage District)
Title:	Restoring Milwaukee Area Underground Waterways and Concrete Lined Channels: Progress to Date and Future Opportunities
Abstract:	The Milwaukee Metropolitan Sewerage District (MMSD) and partners have removed 4+ miles of concrete lining from waterways in the Milwaukee region over the years yet 18+ miles of concrete lining remain. How did so many miles of waterways get paved, what were the perceived benefits at the time, and what have been the benefits of replacing concrete-lined channels with naturalized channels? For over 25 years MMSD has partnered with local governments to reduce flood risk and naturalize concrete-lined channels. This presentation will summarize example projects that have naturalized waterways to not only reduce flood risk but also provide neighborhood-led recreational opportunities, habitat improvements, and other benefits, and look ahead to the additional channel naturalization opportunities of the future.

Breakout Session 1	
Room #2	
Presenter #1:	Christ Olds (Wisconsin Department of Natural Resources)
Title:	Navigating the Floodplain Study Approval Process with WI DNR
Abstract:	There can be many difficulties with getting a floodplain study to meet the regulatory standards set by NR116 and local floodplain ordinances. This presentation will hopefully help explain how, when, and if a floodplain study needs to be submitted to WI DNR for approval.

Presenter #2:	Uriah Monday, P.E. (Wisconsin Department of Natural Resources)
Title:	Wisconsin DNR Dam Inspection Toolkit
Abstract:	Wisconsin DNR requires periodic inspections of large dams. These inspections must be completed by a Professional Engineer registered in the State of Wisconsin hired by the dam owner. The DNR has several forms and resources available for use by engineers conducting these inspections. This discussion will introduce their owners and engineers to these resources and will outline expectations regarding the thoroughness of inspection, documentation, reporting, and timelines.

Breakout Session 1	
Room #3	
Presenter #1:	Rob Woodman PE, NGICP, CPESC (Ferguson Enterprises)
Title:	The 2023 Green Stormwater Designer Survey
Abstract:	Following the success of the inaugural "GSI Designer Survey" conducted by Mr. Woodman in 2021 engaging GSI designers up and down the East Coast, a new survey was developed - the 2023 GSI Designer Survey to ask civil engineers and landscape architects engaged in GSI a series of new questions not covered by the original survey to take a deeper dive into some of the more notable results from the first survey. Specifically - questions surrounding collaboration in design, planning, and budgeting for maintenance and connecting projects to the potential co-benefits of GSI - community, environmental, and financial. Beyond the new questions, some questions were repeated to determine if any change or trends could be identified. This presentation will provide a summary of the results and impactful lessons learned.

Presenter #2:	Carrie Bristoll-Groll, P.E., ENV SP (AQUALIS) Melissa Schmitz, CEM LEED GA (City of Green Bay)
Title:	Developing the City of Green Bay Green Stormwater Infrastructure (GSI) Plan
Abstract:	The City of Green Bay, WI has invested time, effort, and funds into the development of a city-wide green stormwater infrastructure (GSI) plan, to aid in reaching water quality goals, provide flood risk reduction, and contribute to many co-benefit factors. Embraced by City staff including the Mayor and Alders, we'll walk through the journey that the City has taken and get a glimpse of the new GSI plan that will be rolled out in the fall of 2023.

Breakout Session 2	
Room #1	
Presenter #1:	Mark Shubak, P.E. (Strand Associates, Inc.)
Title:	The Lick Run Greenway Sustainable Solution for CSO Control
Abstract:	The Lick Run Greenway Project is one of the largest green infrastructure control projects in the country to reduce combined sewer overflows (CSOs). The 1.5-mile-long project is located on the west side of Cincinnati in the South Fairmount neighborhood. It provides watershed management, flood control, stormwater conveyance and storage, water reuse, and water quality treatment, all integrated into an open channel and civic park. The project also serves to reinvigorate the neighborhood. The Lick Run Greenway project began in 2009, when the design team worked closely with the Metropolitan Sewer District of Greater Cincinnati (MSDGC) to develop a sustainable, community-based watershed management approach to address the excessive number of combined sewer system (CSS) overflows in the 2,700-acre Lick Run Watershed. Within the watershed, which includes 88 miles of storm and combined sewer, opportunities were identified to re-establish the historic Lick Run waterway by redirecting stormwater from the CSS to a central, hybrid surface/subsurface conveyance channel. This project helped MSDGC achieve regulatory compliance by reducing CSO No. 5 overflow volume by 370 million gallons annually. The Lick Run Greenway Project was envisioned to further benefit South Fairmount by being a catalyst for revitalization in the blighted neighborhood.

Presenter #2:	Cassie Goodwin (SmithGroup)
Title:	Addressing Flooding and Equity through Holistic Stormwater Infrastructure Design
Abstract:	The Milwaukee Metropolitan Sewerage District's West Basin project represents the next generation of holistic stormwater infrastructure design: addressing local flooding and water quality issues while creating community access to high quality open space. Manufacturing in the 30th Street Industrial Corridor created thousands of jobs on Milwaukee's north but also took a toll on the local environment. Eventually, industry moved away, leaving a legacy of contamination and impacted hydrology behind. Local infrastructure has often become overwhelmed by more intense storms, flooding thousands of businesses and residences in the Lincoln Creek area. To address this issue, MMSD is planning an 86 acre-foot dry detention basin on a vacant 13-acre brownfield near Lincoln Creek which, combined with two other smaller basins, will manage the 100-year event from a 4.4-square mile watershed. An extensive community engagement campaign has led to an innovative and first-of-its-kind design with community-driven amenities including playgrounds, trails, pavilions, plazas, sledding, a small amphitheater, and even connections to regional trails and adjacent complete street enhancements through a partnership with the City.

Breakout Session 2	
Room #2	
Presenter #1:	Laura Herrick, P.E. (SEWRPC)
Title:	Structure Flood Damage Estimates for Hazard Mitigation Planning.
Abstract:	This presentation will summarize how structure flood damage estimates are completed by SEWRPC staff for countywide hazard mitigation plans. The discussion will include how flood levels are found at each building, how insurable structures are determined, and how damages are calculated based on flooding depth, type of structure, and building assessment. And finally, the talk will discuss how this data can be used by communities to help prioritize mitigation efforts.

Presenter #2:	Steve Neary, P.E. (Wisconsin Department of Transportation)
Title:	Lake Superior Water Level Impacts on Bridge Scour
Abstract:	In August 2021 a routine inspection revealed significant scour at B-4-57, a three-span girder bridge located west of Ashland WI on USH 2. This bridge spans the mouth of Fish Creek as it empties into Lake Superior. Structural analysis of the bridge determined that additional scour would affect pile capacity and increase the potential for pile instability. Field and USGS gage observations show multiple changes in flow direction per day due to lake seiche. As a result, deep scour holes have developed at both upstream and downstream ends of the bridge. A 2D hydraulic model was created to determine future scour potential and guide decision-making for the implementation of scour countermeasures. Pier scour protection was installed in late 2022 using innovative techniques for deep water and low bridge clearance. Sonar depth sensors were installed in May 2023 to provide real-time streambed elevations. 2D modeling showed the greatest scour potential when Lake Superior levels are low and angle of attack on bridge piers is most severe. Recent fluctuations in Lake Superior water levels – including multiple lows since 2007 – provide an interesting perspective for resilient structure design along Great Lakes coastal areas given uncertain future climate conditions and resulting impacts to water surface elevations.

Breakout Session 2	
Room #3	
Presenter #1:	Peter Shedivy (HNTB) Mike Schwar (Stony Point Hydrology)
Title:	Wilson Park Creek 2-D Confluence Modeling
Abstract:	As a part of the Kinnickinnic River Watershed Flood Management Plan, the Milwaukee Metropolitan Sewerage District intends to remove approximately 2800 linear feet of decaying concrete channel in Wilson Park Creek (WPC) and construct a new naturalized rock-lined channel and vegetated floodplain in its place. One design challenge is Holmes Avenue Creek (HAC), a tributary draining 1.7 acres of highly urban land, discharges into this WPC design reach. This introduces flow patterns not reflected in standard 1D hydraulic models, such as HEC-RAS. Therefore, a 2D HEC-RAS simulation of the confluence area was developed to aid in the evaluation of flow conditions and scour risk. The 2-D model was able to represent the 2-D flow patterns observed in natural and modeled confluences described in studies. One significant factor that influences flow conditions is the ratio of the HAC flow to the coincident WPC flow, resulting in momentum from HAC that significantly affects the flow pattern, increasing scour risk in the confluence and along the WPC bank across from HAC. The design team considered the probability of different coincident flows and the probable increase in scour from turbulence and the anticipated flow patterns to determine where stability measures may be required.

Presenter #2:	Megan Bender, P.E. (Geosyntec Consultants) Rishab Mahajan (Geosyntec Consultants) Emily Campbell (Geosyntec Consultants)
Title:	Unconventional Case Studies in Floodplain Mapping
Abstract:	This presentation will guide the audience through up to four case studies (if there is time) that showcase challenging hydraulic scenarios and how technical practitioners were able to develop floodplain or inundation maps to reflect those unique conditions. The case studies are as follows: 1. When flooding doesn't stop at the watershed divide (Texas): This case study features a post-mortem flooding analysis that was done to determine why a property flooded much more than the FEMA flood map anticipated it would. 2. When dams are like dominoes (Georgia): This case study includes three high-hazard dams in series and looks at the impact of flooding when the upstream-most dam breaches. 3. You built what in the floodway? (New England): Superfund projects do not require permits, even if they are constructed in the floodway. This case study shares how a complicated treatment system was incorporated into a community's flood map.

Breakout Session 3	
Room #1	
Presenter #1:	Andrew Struck (Ozaukee County)
Title:	Stormwater Wetlands at Ozaukee County Parks
Abstract:	The Ozaukee County Planning & Parks Department (Department) is creating stormwater treatment wetlands at multiple Ozaukee County Parks in the City of Mequon, WI. Wetland construction at the Little Menomonee River Fish & Wildlife Preserve was completed as part of a unique large-scale ecological habitat restoration project to holistically restore aquatic connectivity and enhance instream, riparian corridor, floodplain, and wetland habitat while addressing water quality impairments. The Department also removed an unnecessary, redundant portion of asphalt near the Mee-Kwon County Park Golf Course clubhouse and created three stormwater treatment wetlands to treat stormwater runoff from the existing parking lot. The Department is also working to improve stormwater/wetland drainage through a wetland restoration at Virmond County Park, a 63-acre park with 1,350 feet of Lake Michigan shoreline and 130-foot-high unstable clay seepage bluffs. Preservation of the clay seepage bluffs significantly contributes to the quantity and quality of surface waters by protecting the groundwater contributions and wetlands on and near the site. Presentation learning objectives include: (1) Stormwater management projects can achieve multiple environmental and ecological objectives; and (2) Incorporate stormwater management into infrastructure planning.

Presenter #2:	Carrie Bristoll-Groll, P.E., ENV SP (AQUALIS)
Title:	Nutrient Sourcing and Mitigation Solutions at a Wisconsin Inland Lake
Abstract:	This case study focuses on a Fond du Lac County lake, approximately 4.5 miles south of Lake Winnebago. The surrounding drainage area consists of both residential and agricultural land use. Algae blooms within the lake, indicative of high nutrients, are becoming more frequent, rendering the lake periodically unusable by residents, and ultimately discharging nutrients downstream to Lake Winnebago and Lake Michigan, via Green Bay. The Lake Association has been unable to adequately identify nutrient sources nor develop affordable, viable solutions to the high nutrient inputs. A local non-profit organization serving the greater Lake Winnebago watershed contracted with AQUALIS (formerly Stormwater Solutions Engineering, LLC) for pollutant source analysis and alternative recommendations. AQUALIS used modeling and field samples to estimate the phosphorus contributions from stormwater runoff, shallow groundwater, and lakebed sediments. A mitigation plan including projects of varying scales and costs was developed with funding from the Fund for Lake Michigan, to reduce the phosphorus inputs identified in the nutrient balance. One solution includes a pilot project using EutroSORB media filters in a channel with high nutrient inputs. The pilot project was installed in July 2023 and monitored through volunteer grab samples. The presentation will discuss the process of the analysis, including community engagement, the recommendations of the plan, and the anticipated future milestones.

Breakout Session 3	
Room #2	
Presenter #1:	Phillip Taylor (Hydro International)
Title:	Innovative Flow Control for Detention Cost Saving and Climate Resilience
Abstract:	On-site management of the stormwater runoff volume is frequently one of the most difficult and expensive parts of a stormwater management. More frequent and intense rainfalls are resulting in many regulators looking to adjust the design storms to higher volume storms, and combined with increasingly restrictive regulations limiting discharge rates, are increasing the amount of on-site detention required. Traditional outlet designs typically use orifice plates to limit the outflow. Modeling the inflow-to-outflow relationship dictates the required volume for detention and the overall cycle time of the tank. As outlet flows become more restrictive, detention tanks get larger, and tank cycle time increases. This can result in the tank not being fully drained and bypassing water that should be detained. The enemy of detention is consecutive storms. As the inflow is fixed by the design storm, the outlet control structure's hydraulic response to the inflow can have a significant impact on the size and configuration of the detention system. The use of vortex flow control devices can offer significant improvements in the inflow-to-outflow response, enabling the designer to make the detention system more robust and able to handle more frequent storms, while optimizing the footprint and volume, saving their client significant money. This presentation will case study the use of vortex flow controls that have resulted in significantly better detention tank outlet design over traditional orifice plate or weir designs, with significant cost savings and faster cycle times.

Presenter #2:	Kyla J. Wood, PhD (Applied Polymer Systems, Inc)
Title:	Flocculants for Passive Stormwater Treatment
Abstract:	Flocculants such as anionic polyacrylamides (PAMs) are used to enhance existing and traditional BMPs when they are unable to meet discharge requirements for small and challenging materials like clay, silt, and metals. These versatile flocculants can provide passive, cost-effective, low-energy, and low-maintenance stormwater treatment. PAM is produced as granular but is also available as a liquid emulsion and solid log form. PAM logs are designed specifically for water clarification and have many characteristics that make them favorable and effective for water treatment. PAM logs release a steady dose of polymer, do not require meters, injection systems, or filters, do not alter pH, are safe for sensitive aquatic organisms, are safe and easy to handle, and can be used in a wide range of temperatures. PAM logs are versatile and can consistently remove upwards of 90-95% of turbidity and TSS when fundamental principles of PAM use are followed. The success of PAM treatments relies heavily on creating conditions conducive to effective and complete flocculation and achieving adequate dosing and mixing. This presentation will discuss anionic-type polymer-based treatment systems that are safely and effectively used in construction, development, and stormwater treatment systems. Proper selection, application, usage, maintenance, and troubleshooting of these systems will be discussed and illustrated with real-world examples. Participants will gain applicable knowledge of PAM treatment systems and how they may be utilized to improve stormwater quality and clarity.

Breakout Session 3	
Room #3	
Presenter #1:	Bryan Christopherson (Floodproofing.com)
Title:	Understanding Active & Passive Floodproofing Solutions
Abstract:	Floodproofing measures are required for all buildings located in a FEMA floodplain. This course identifies the effects of hydrostatic pressure on building sustainability and explains dry and wet floodproofing techniques utilized to mitigate against flood damage. A review of the liability associated with each floodproofing option is provided. Relevant FEMA regulations including the 2021 revised Technical Bulletin 3, ICC building codes, and ASCE 24 are reviewed.

Presenter #2:	Tammie DeVooght Blaney (International Assn of Structural Movers)
Title:	Benefits of Elevation for Buildings Prone to Flooding
Abstract:	A review of data from FEMA and federal sources that discuss elevating homes as one of the viable and allowable options for flood hazard mitigation. This presentation will cover data and share cost comparisons for specific areas in the United States. Wisconsin data is limited, but is transferrable.