

MARCH 1–3, 2021 • VIRTUAL

# 11th Annual St. Louis River Summit

## Resilient Ecosystems, Resilient Communities

### 2021 Summit Agenda

\*All times listed Central Standard Time

#### Monday, March 1

8:45AM • WELCOME AND INTRODUCTIONS

Remarks from Fond du Lac Chairman Kevin Dupuis

9:10-10:00AM • KEYNOTE SPEAKER

#### **Dudley Edmondson**

The Disconnect Between African Americans and the Outdoors

Sponsored by EPA's Great Lakes Toxicology and Ecology Division

Dudley Edmondson is an established photographer, author, filmmaker and presenter. His photography has been featured in galleries and nearly 100 publications around the world.

He was one of the first to highlight the involvement of African Americans in the public lands system. Unsatisfied with the numbers of people who looked like him among those he encountered in his outdoor pursuits, Mr. Edmondson set out to create a set of outdoor role models for the African American community by writing his landmark book, *Black & Brown Faces in America's Wild Places* (AdventureKeen Publications, 2006), featuring luminaries in the environmental and outdoor recreation fields. Mr. Edmondson has also been immersed in the effort to help the conservation sector become more inclusive.

His latest book, *What's That Flower? A Beginners Guide to Wildflowers*, was published in 2013 by DK Publishing, London, UK.

[dudleyedmondson.com](http://dudleyedmondson.com)

#### Session 1: The Heart of the River

Sponsored by LimnoTech and Minnesota Environmental Partnership

10:15AM • SESSION 1 INTRODUCTION

Housekeeping and etiquette overview

10:20AM

Placemaking by Students for the U.S. Steel Plant Site

Carl Sack, Fond du Lac Tribal and Community College

It's 2028, and cleanup has finished on the St. Louis River-U.S. Steel Superfund Site. You are now working for a local landscape architecture firm and have been asked by the City Council to come up with a site use plan for the area encompassing the former Duluth Works plant. So begins the prompt for a place-making project in the Cultural Geography course at Fond du Lac Tribal and Community College. Over 40 students in three classes have completed the assignment to develop a vision for the biggest brownfield site in the St. Louis River Estuary that connects it to its past and the surrounding community. This presentation will share highlights and key elements that students have envisioned for the future of this reclaimed place.

10:45AM

St. Louis River AOC update and 2020 progress

Matt Steiger, Wisconsin DNR

The St. Louis River Area of Concern (SLRAOC) Remedial Action Plan describes 80 management actions that must be completed in order to remove nine Beneficial Use Impairments (BUIs) and delist it. At this time, 51% of the management actions are complete, inching our way toward delisting the SLRAOC. In this past year, several construction projects were completed, studies were nearer to conclusion, and important interim project milestones were met. This presentation will highlight the past year's accomplishments, the

current projected BUI removal timeline, planned 2021 field work, and significant milestones expected in 2021.

11:20AM

Neighborhood-scale indicators of waterfront revitalization and human well-being in Great Lakes AOCs and coastal communities

Theodore Angradi, US Environmental Protection Agency

Aside from economic data, local-scale (nominally neighborhood-scale) data on change in human well-being associated with natural capital improvements are rarely collected. Natural capital improvements at the waterfront may result from remediation, habitat restoration, climate adaptation, revitalization, Brownfield, and other projects. Local data are needed to develop indicators with which to assess the socioeconomic and cultural benefits of these projects for tracking outcomes, decision support, and the development of new tools for communities to use for planning sustainable revitalization. We compiled US Census tract-scale data for five coastal metro areas: Duluth/Superior, Green Bay, Milwaukee, Chicagoland, and Cleveland. Data were obtained from Census Bureau, CDC, NOAA, NGO, EPA, and other sources. We assemble a set of candidate benefit indicators, and a set of candidate indicators of green and built waterfront amenities. Indicators are from multiple human well-being domains including urban design, resilience to disasters, health outcomes, leisure and culture, crime and safety, social networks, natural environments, employment and income, public open space, air quality, demographics, housing, education, land use, and social equity. We will explore associations among amenity and benefit indicators and how those associations are mediated by demographic and geographic covariates. In this presentation we will share preliminary results of this study and outline how these indicators may be useful in the local context.

11:35AM

A Virtual Tour of the Kingsbury Bay and Grassy Point Habitat Restoration Projects

Melissa Sjolund, Minnesota DNR

After many years of planning and preparation, restoration of aquatic habitats at Kingsbury Bay and Grassy Point commenced in 2019. Both projects are listed as required management actions associated with the St. Louis River AOC's loss of fish and wildlife habitat beneficial use impairment.

The presentation will give a brief background on the project goals and design, followed by a virtual tour of the restoration in action over the course of the 2019 and 2020 field seasons. The tour will consist of a narrated overview of the restoration work using videos and photos, followed by a brief update on the work remaining for 2021.

11:50AM

Preliminary results from tests of activated carbon on mercury bioaccumulation in mesocosms

Mitchell Jans, University of Minnesota Duluth

Mercury (Hg) contamination plagues many waterways throughout the nation, impairing wildlife consumption opportunities and creating risk for sensitive populations. Historic contamination is a major issue for sediments in harbors and historic industrial zones and contaminated sediment is a top priority in remediation and restoration efforts. Through the use of activated carbon (AC), sediment-associated Hg binds to amended carbon and is removed from potentially bioaccumulative phases in the ecosystem. Prior research into AC's impact on sediment Hg has been conducted on small scales without realistic ecology and in large ecosystems with little control over geochemistry and hydrology. However, no research has demonstrated AC's effectiveness at an intermediate scale that includes vegetation, flowing water, and tight controls on hydrogeochemical conditions. This project is designed to test the ability of AC to reduce bioaccumulation in a controlled, mesocosm environment with ecological and hydraulic complexity similar to that found in wetlands of the St. Louis River Estuary. Preliminary results with amended material from Kingsbury Bay found that a monoculture of vegetation (*Sagittaria latifolia*) grew well in sediment with and without 5% by mass AC amendment in both shallow (< 5 cm) and deep (15 cm) water conditions. Dissolved organic carbon (DOC), a key binding phase for Hg, was reduced by 50 to 70% in sediment porewater during the first year of the study. The bioaccumulative form of mercury, methyl mercury (MeHg), was lower in the sediment solid phase after 6 months of amendment. Subsequent years of the study will focus on maintaining water flushing and realistic ecological complexity in mesocosms to determine whether these reductions of Hg and MeHg in sediment translate to lower bioaccumulation in benthic invertebrates and water column algae.

12:05PM • MEET IN THE HALLWAY

A virtual opportunity to 'Meet in the Hallway' (a Zoom breakout room) with presenters. Use this time to ask additional questions and connect with your colleagues!

12:30-1:30PM

St. Louis River Landscape Conservation Design Project System Analysis Update  
Gini Breidenbach, Minnesota Land Trust

In this networking session, the St. Louis River Landscape Conservation Design team will share an update of the system analysis they have been conducting. This analysis, which is being conducted for eight planning units across the estuary landscape, aims to catalog and describe existing plans and projects, assess issues and stakeholder interests, and identify potential metrics and decision support tools that are either available or desired. The objective of this networking session is to (1) share an update of what has been done to date, and (2) provide stakeholders and partners an opportunity for feedback and to contribute insight regarding potential information, data, or resources. A particular focus will be on the Allouez Bay planning unit, where a more detailed natural resources restoration plan is being developed.

## Session 2: Estuary and Tributaries

Sponsored by Wisconsin Sea Grant and Western Lake Superior Sanitary District

2:00PM • SESSION 2 INTRODUCTION

Housekeeping and etiquette overview

2:05PM

Duluth's First Natural Resource Management Program Plan  
Diane Desotelle, City of Duluth

The City of Duluth received Great Lakes Restoration Initiative Funds from the Environmental Protection Agency to advance its work to protect, restore and manage the City's natural resources all directly linked to Lake Superior and the St. Louis River Estuary. The project is providing funds for the development of the City's first ever Natural Resource Management Program Plan (NRMPP). In addition, there are funds to acquire lands for preservation in the St. Louis River corridor and to restore 30 acres of forest designed to enhance bird migration and nesting habitat in the Kingsbury Creek Watershed. The goal of the NRMPP is to establish a framework that is embraced by the community and our federal, state and local partners. The NRMPP will begin to establish clear goals and strategies for the preservation, restoration and management of the City's highly valued public lands in partnership so we can move forward efficiently to complete projects and monitor our work together. This presentation will outline the NRMPP process and provide information on where you can learn more about the process.

2:30PM

Rusty Blackbird migratory stopover in the St. Louis River Estuary  
Steve Kolbe, Natural Resources Research Institute – UMD

Rusty Blackbirds are among the most rapidly declining bird species in North America, but the reasons driving these declines have confounded researchers. One hypothesis is that suitable habitat during the migratory and nonbreeding seasons is limited. Rusty Blackbirds rely on forested wetlands for nesting, foraging, and roosting during every part of their life cycle. Tens of thousands of Rusty Blackbirds use the north shore of Lake Superior and the St. Louis River Estuary (SLRE) as a migration corridor each spring and fall; this concentration of migrants is rarely seen in other parts of its range. The relative importance of sites within the SLRE to Rusty Blackbirds is poorly understood. In the fall of 2019, eight autonomous recording units were placed along the SLRE to document where, when, and for how long Rusty Blackbirds used the area. While individuals were detected throughout the estuary, Rusty Blackbirds strongly preferred the areas of the upper SLRE from Mud Lake to Chamber's Grove. During the fall of 2020, in an effort to understand the temporal and geographic use of the SLRE by individual Rusty Blackbirds, we fitted 35 birds with telemetry tags and deployed six automated telemetry stations to assess the duration of stay and movements within the estuary. Our results showed that individual Rusty Blackbirds exhibited high levels of stopover site fidelity and remained within the SLRE for up to 24 days, far longer than a typical migratory bird stopover. Our research highlights the critical importance of forested wetlands in the SLRE to declining Rusty Blackbird populations and emphasizes the need to protect and conserve this habitat and restore the estuary and surrounding environs. It also highlights the need for additional research in the estuary that can elucidate the fine-scale habitat needs of Rusty Blackbirds during this important phase of their annual cycle.

2:55PM

An update on the Degraded Fish and Wildlife Populations Beneficial Use Impairment (aka BUI 2)

Melissa Sjolund, Minnesota DNR

The St. Louis River Area of Concern's degraded fish and wildlife populations beneficial use impairment (also known as BUI 2) will be ready for removal consideration in 2021. This will be the fourth BUI proposed for removal out of nine total BUIs in the AOC. The presentation will review the six completed management actions, which include habitat restoration projects, population monitoring, and species-specific studies. Successful completion of the management actions will be compared to objectives set for target species in the estuary and evaluated against the overall removal target for BUI 2. Lastly, the process for BUI removal and public review/participation will be outlined.

3:20PM

Unlocking the Secrets to Citizen Science: When and Where Folks Want to Study Streams  
Tiffany Sprague, Natural Resources Research Institute – UMD

We're back! You may remember us from such classics as "scientists heart big data...but dislike social interactions..." and "we like to give our gauges a monthly sponge bath to keep them clean for our citizens." Rest assured, since the 2019 Summit, we still like data, actively avoid communication, and are routinely sponging down gauges (well, the undergrads are at least). For those just now joining us—Welcome! Duluth was the first city in Minnesota to participate in CrowdHydrology, a nationwide crowd-sourced citizen science stream depth monitoring program. Anyone with a cell phone can submit a text message of water depth data observed from a staff gauge (think giant ruler) placed in a nearby stream or lake. In the meantime, we've expanded the network of gauges into communities surrounding Duluth, and have finally started to look at the number one requested analysis—gauge usage and visitation statistics. Are Tuesdays after 5 p.m. a prime time to measure stream depth? Is Dorothy a rock star data-submitter, whereas Mike—well Mike left their phone back at the house the last 365 days... Are city parks really all they're cracked up to be? Join us as we provide the magical formula for getting folks to your citizen science monitoring locations and submitting the data of your dreams. Disclaimer: True magic is reserved for the fortunate few; we're still waiting on our letters.

3:35PM

A Virtual Tour of the Little Balsam Creek Fish Passage Project, Patzau, WI  
Matt Steiger, Wisconsin DNR

Wisconsin DNR staff will walk you through a filmed tour of the Little Balsam Creek Fish Passage Project. As part of the Loss of Fish and Wildlife Beneficial Use Impairment for the St. Louis River Area of Concern, this project aims to restore free passage to aquatic organisms to over 5 miles of Class 1 trout stream. This project began in 2016 with an AOC-wide culvert/barrier inventory and so far three barriers have been removed in Little Balsam Creek. The final barrier removal is planned for 2022. Perched and damaged culverts were replaced with bankfull-sized, bottomless arch structures and allow fish passage at nearly all flow conditions.

3:50PM

Manoomin Restoration in the St. Louis River Estuary  
Darren Vogt, 1854 Treaty Authority

Manoomin (wild rice) is a culturally significant resource, an important natural food source, and a component of a healthy ecosystem. Historical information suggests that the St. Louis River Estuary once contained vast stands of manoomin. Due to habitat changes and industrial impacts, the resource has been significantly reduced with only small remnant areas present. Improvements in environmental quality in recent years has provided an opportunity for manoomin restoration. Partners worked cooperatively to develop a "Wild Rice Restoration Implementation Plan for the St. Louis River Estuary" in 2014. From 2015 to 2020, a coordinated manoomin restoration initiative occurred. Activities were completed through cooperation between the Minnesota Department of Natural Resources, Minnesota Pollution Control Agency, Wisconsin Department of Natural Resources, Minnesota Land Trust, Fond du Lac Band of Lake Superior Chippewa, 1854 Treaty Authority, and Great Lakes Indian Fish & Wildlife Commission. The Fond du Lac Band acquired manoomin and completed seeding each year. Additional work was done on vegetation removal before seeding and goose deterrents such as construction of exclosures in some years. The 1854 Treaty Authority completed monitoring activities to track restoration success. Since 2015, this restoration effort has seeded 52,944 pounds of manoomin over about 219 acres in 12 different areas. Success has varied, and restoration has likely been impacted by geese browsing and higher water levels. Funding (Great Lakes Restoration Initiative, Great Lakes Restoration Act – National Fish & Wildlife Foundation – Sustain Our Great Lakes, Minnesota Outdoor Heritage Fund) managed by the U.S. Environmental Protection Agency, Bureau of Indian Affairs, Minnesota Department of Natural Resources, Wisconsin Department of Natural Resources, and Minnesota Land Trust has supported project activities. A

report summarizing restoration across all years can be found on the 1854 Treaty Authority website (<https://www.1854treatyauthority.org/reports/reports.html>).

4:05PM

Video: Restoring Wild Rice in the St. Louis River, Matt Steiger

4:10PM • SESSION 2 CLOSE

4:15PM • MEET IN THE HALLWAY

A virtual opportunity to 'Meet in the Hallway' (a Zoom breakout room) with presenters. Use this time to ask additional questions and connect with your colleagues!

## Tuesday, March 2

9:00AM • WELCOME AND INTRODUCTIONS

Remarks from Superior Mayor Jim Paine

9:10-10:00AM • KEYNOTE SPEAKER

### **Cameron Davis**

A Field Guide to Hugging the St. Louis River

Sponsored by Wisconsin Coastal Management Program

About Cameron Davis

Cameron Davis is a vice president at GEI Consultants, where he helps the region with coastal resilience, green infrastructure, climate adaptation and water resources. In 2018, he was elected as commissioner at the Metropolitan Water Reclamation District of Greater Chicago after what was one the most unusual races in Illinois history, where he ran as a write-in candidate, beating the previous statewide write-in record set by Franklin Delano Roosevelt in 1944.

From 2009 until 2017, he was President Obama's Great Lakes "czar," coordinating the work of 11 federal departments and serving as the Administration's liaison to Capitol Hill in investing more than \$2 billion under the Great Lakes Restoration Initiative. He also led the federal effort to block Asian carp from reaching the Great Lakes through the Chicago River.

Cam has dedicated his entire career to the public's interest in water, having served as a public interest Clean Water Act attorney, professor at the University of Michigan Law School, and President & CEO of the Chicago-based Alliance for the Great Lakes. But his proudest achievement is having started his career as a volunteer.

He lives across the street from Lake Michigan with his wife Dr. Katelyn Varhely, a child psychologist, and two children.

## Session 3: Our Shared Watershed

Sponsored by Minnesota Sea Grant and Minnesota Land Trust

10:15AM • SESSION 3 INTRODUCTION

Housekeeping and etiquette overview

10:20AM

Remediation to Restoration to Revitalization: Integrating Ecosystem Services and Human Wellbeing for Waterfront Communities

Joel Hoffman, US EPA Office of Research and Development

Remediation to Restoration to Revitalization (R2R2R) is a social-ecological systems (SES) framework to identify ecological and policy-based relationships between large-scale aquatic sediment remediation projects, associated habitat restoration projects, and waterfront community revitalization. A defining feature of R2R2R is that it possesses three essential feedback loops: a translational ecology feedback loop, an adaptive management feedback loop, and a project management feedback loop. In the R2R2R framework, translating ecological changes from remediation and restoration projects into public benefits (e.g., swimmable water, potential for urban blue and green spaces) using the concept of ecosystem services is critical to support decision-making. The R2R2R framework addresses the role of humans through these feedback loops and recognizes the ability of communities to learn and make choices that

improve the environment through translational science, providing a method to adequately consider the complexity of human society that is difficult to include in SES research. In practice, community perceptions and uses of the remediated and restored ecosystem or habitat are central to achieving both ecosystem and community goals. As a practice, the R2R2R framework integrates diverse interests through ongoing opportunities for engagement and provides an opportunity to consider resilience in decision-making through research and science-based analysis of decision alternatives. We use the Great Lakes Area of Concern program to illustrate how R2R2R is ideally incorporated into ecosystem-based management for large, complex sediment remediation and aquatic habitat restoration projects.

10:45AM

Building Social Resilience Through Equitable Remediation and Restoration

Jennifer Josephs, US EPA

For decades, the EPA has been working to integrate environmental justice (EJ) and social equity through guidance materials, programs, tools, and research initiatives to protect vulnerable and marginalized populations from the harmful effects of environmental contamination. Fully integrating EJ and equity is a work in progress, but the unified calls from marginalized communities for racial justice and equity indicates an opportunity to significantly advance EPA's EJ and equity priorities, including support for marginalized communities impacted by AOC contamination and cleanup. Marginalized populations are disproportionately exposed to environmental contaminants and bear inequitable health consequences. Marginalized populations are often confronted with institutional barriers that inhibit equitable access to resources that support human health and well-being. Marginalized populations are calling on more privileged communities to engage with them to identify, recognize, and break down the barriers of access and institutional racism and to confront racial injustice, discrimination, and inequity. Communities impacted by sustained institutional racism and discrimination may experience trauma that contributes to a cycle of disparity and diminished resilience. We will examine the effects of adverse community experiences and illustrate the connection between institutional racism and discrimination, and how those factors impact marginalized community capacity to not only obtain a higher level of resilience to physical, social, and environmental challenges, but also to engage in and benefit from AOC projects. This research will show that innovative strategies are needed to extend AOC collaborations beyond the standard boundaries of the water and nearshore remediation, restoration, and revitalization activities to address SHC goals for equitable community benefit, well-being, and social resilience.

11:00AM

Expanding the boundaries of resilience: how considering the social creates a stronger Twin Ports

Kathleen Williams, US EPA Office of Research and Development

Resilience is a term that has different meanings depending on context, including the ability to resist the harmful impacts of some type of change. Socioecological systems research has been largely based on biophysical and policy approaches and engineering solutions that rely heavily on physical interventions. Other schools of resilience research include psychological impacts or response, as well as community or social vulnerability to different types of hazards (e.g., natural, environmental, economic, and political). Although resilience research and public policy interventions have relied heavily on systems approaches that favor ecological assessment and engineering solutions, this creates a gap because the community and social dimensions of resilience are considered outside the system and may not be part of comprehensive solutions. Scholars in disaster studies and vulnerability have demonstrated that community attributes (e.g., social cohesion and social networks) are important support systems that enhance how a community responds to disturbances. One important environmental change that faces the Twin Ports region is the legacy of contaminants and habitat loss in the rivers and harbors. We argue that the emergence of a network of community advocates and natural resource professions serve as an important network that enhances the ability of organizations and agencies to address this environmental change. More importantly, strength of the social connections create opportunities to connect to networks addressing other stressors to build stronger, more comprehensive network based on mutually beneficial plans and outcomes to enhance regional resilience.

11:25AM

Contaminated Sediment Sites in the St. Louis River Area of Concern: How we manage risk and select the best remedial approach

LaRae Lehto, Minnesota Pollution Control Agency

The St. Louis River Estuary is the second largest of 43 locations throughout the Great Lakes that were designated Areas of Concern by the International Joint Commission, requiring cleanup of contaminated sediments. Due to decades of uncontrolled pollution before modern pollution laws went into effect, riverbed sediments are contaminated with mercury, dioxins, polychlorinated biphenyls (PCBs), polycyclic

aromatic hydrocarbons (PAHs), and heavy metals. These pollutants have settled out in sediments at the bottom of the St. Louis River and continue to threaten public health, contaminate fish and wildlife, and make waterfronts unusable in Duluth and other coastal communities along Lake Superior.

Minnesota's cleanup plan is now underway, made possible by the availability of state and federal funding. It has taken many years of assessment work and planning to enter into the current phase of remedial construction. Once the sites requiring further actions to address contaminated sediments were selected, the next steps were to fully characterize the risks to human health and the environment, and to select the best remedial alternative to effectively manage those risks. There were many factors considered by the MPCA and our project partners when selecting a remedial approach for each site, including the long-term effectiveness and performance, accommodation of current or planned future use, implementability and constructability, cost and funding, the long-term monitoring and maintenance required, potential to improve habitat, and the landowner and public desires for the site.

The three main remedial strategies selected for implementation at the Minnesota sites are engineered caps, application of activated carbon amendments, and full dredge and removal. To date, four contaminated slips have been remediated with engineered caps to remove exposure to contaminated sediments. A full dredge and removal of contaminated sediments has been selected for the ponds behind Erie Pier and Munger Landing sites. Application of activated carbon amendments is the selected remedial alternative for the Scanlon and Thomson Reservoirs.

Learn about the process the MPCA followed, along with our partners at the U.S. Environmental Protection Agency and U.S. Army Corps of Engineers, to manage risk and select the best remedial alternatives for the contaminated sediment sites in the St. Louis River.

11:50AM

Slow the Spread Campaign for Invasive Spiny Water Fleas

Valerie Brady, Natural Resources Research Institute, University of Minnesota Duluth

The invasive spiny water flea, a predacious zooplankton, is present and often abundant in Lake Superior, the St. Louis River Estuary, and many inland lakes in the Great Lakes region. Preventing the spread of spiny water flea to uninfested lakes is an important management priority because they can reduce the abundance of native zooplankton, reduce the food for planktivorous and young fish, and thus alter food webs. Humans are the primary spread vectors for spiny water flea through movement of infested water and fouled equipment between lakes. We tested the susceptibility of commonly used fishing gear to fouling by spiny water flea by simulating the use of gear (fishing lines, downrigger cables, bait buckets, livewells, and anchor ropes) on two infested Minnesota lakes. We found that surface and downrigger lines became readily fouled by spiny water fleas when the fleas were present in the water, even at low ambient densities. Lesser amounts of fouling occurred with livewells and downrigger cables. Fouling rarely occurred with bait buckets and anchor ropes. We will highlight our upcoming slow the spread campaign including a towel printed with instructions for wiping off spiny water fleas, and PSAs created for television and YouTube.

12:05PM

Quantification and Characterization of Microplastics in the Water Column of Western Lake Superior

John Fox, University of Minnesota Duluth

The amount of plastic waste entering the environment has steadily increased over the past 60 years and plastic contamination is now ubiquitous in aquatic systems across the planet. Before chemically degrading to constituent monomers and oligomers, plastic waste in the environment physically breaks down into smaller, more abundant microplastic particles. The behavior of microplastic in the environment is distinct from that of macroplastic and is not yet fully understood. Recent studies of microplastic in the marine environment have fractionated samples by particle dimension to determine the size distribution of microplastic waste and understand its fate in the environment. Efforts to quantify freshwater microplastic waste within the waterways of the Great Lakes region have focused on size fractions greater than 300  $\mu\text{m}$  and sampling has largely been confined to surface waters, and benthic and shoreline sediments. In this project, we aim to characterize the size distribution of microplastic particles in western Lake Superior from 5  $\mu\text{m}$  to 300  $\mu\text{m}$ , to our knowledge a previously uninvestigated size range within Great Lakes waterways. Samples were collected from various depths in the water column to understand the vertical distribution of microplastic waste. This effort to characterize the vertical distribution of microplastic in the water column of Lake Superior is the first of its kind. Sampling occurred at five locations in western Lake Superior and methods included manta trawling, volume sampling, and in situ pumping and filtering. Microplastic identification and quantification is currently ongoing and utilizes visual microscopy, an established yet laborious and bias-prone technique, and FTIR microscopy, a less-established technique

that nonetheless has the potential to reduce researcher bias and increase throughput speed via automated counting and characterization. Results from this research will contribute to the growing body of knowledge regarding the fate of microplastic waste in freshwater systems. Knowledge regarding the size and spatial distribution of plastic waste throughout freshwater ecosystems will allow for more efficient conservation policies and targeted efforts aimed at mitigating further contamination.

12:20PM • SESSION 3 CLOSE

12:25PM • MEET IN THE HALLWAY

A virtual opportunity to 'Meet in the Hallway' (a Zoom breakout room) with presenters. Use this time to ask additional questions and connect with your colleagues!

## Session 4: Life in a Working Harbor

Sponsored by Roen Salvage Company and Duluth Seaway Port Authority

2:00PM • SESSION 4 INTRODUCTION

Housekeeping and etiquette overview

2:05PM

Beneficial Use of Dredged Material

James Luke, US Army Corps of Engineers

Provide an overview of dredging and the beneficial use of dredged material in Duluth-Superior Harbor. Show examples of previous projects that have utilized material for shore protection, beach nourishment, and ecosystem restoration. Discuss the value and need for partnerships amongst a variety of stakeholders.

2:30PM

Harbor Technical Advisory Committee (HTAC) – An Overview

Mike Wenzholz, Metropolitan Interstate Council (MIC)

The Duluth-Superior Metropolitan Interstate Council (MIC) is a regional transportation planning agency. The MIC works with local jurisdictions to encourage local policy decisions and multi-modal infrastructure projects that will provide a transportation system that effectively moves both people and goods, and serves all users. One of three advisory committees to the MIC, the Harbor Technical Advisory Committee (HTAC) is a longstanding, diverse stakeholder group that addresses challenges and opportunities in the Duluth-Superior Harbor, while promoting the port's economic and environmental importance to both communities. It is the only stakeholder group of its kind in the country and has a growing list of successful planning and policy initiatives. This presentation will provide an overview of the HTAC and share several examples of what the HTAC has accomplished.

2:55PM

Paddle Safe: Enhancing water recreation safety in the Twin Ports

Madison Rodman, Minnesota Sea Grant

The Twin Ports of Duluth, Minnesota and Superior, Wisconsin, St. Louis River Estuary, and the nearby North and South shores of Lake Superior support a diverse array of user groups. Novice paddlers and freighter captains alike share these beautiful waters. Increased recreational traffic in the Duluth-Superior Harbor prompted the formation of a Harbor Safety Workgroup focused on a variety of water safety topics. This group is a working group of the Navigation Subcommittee of the Harbor Technical Advisory Committee, which is an advisory committee of the Duluth-Superior Metropolitan Interstate Council. In the summer of 2017 the group tasked the University of Minnesota Sea Grant College Program with assessing the perspectives of safety and risk by recreational boaters who use local waters. Results from the 2017 survey identified a need for a coordinated effort promoting paddle sport (canoe, kayak, and paddleboard) safety by leaders in the water safety, paddle sport, shipping, and motorized boating communities. Specific actions recommended included creating safety messaging prioritized to high-activity locations in the Duluth-Superior Harbor, addressing mixed user groups, and creating a web portal with information on local non-motorized boating safety.

In 2020, Minnesota Sea Grant and the Harbor Safety Workgroup received a Short Term Action Request (STAR) grant from Minnesota's Lake Superior Coastal Program to address the actions recommended in the 2017 survey. This short presentation will share the outcomes of the collaborative Paddle Safe Twin Ports project including highlighting the features of the interactive website ([PaddleSafeTwinPorts.org](http://PaddleSafeTwinPorts.org)) and launch site signs promoting paddle safety. Specifically, the presentation will share unique features of the

website including a digital fillable float plan and local conditions dashboard in anticipation of a busy 2021 water recreation season. The outcomes of the project work to support safe, multi-use working waters for all by addressing the concerns of the maritime shipping industry, tourism, and local recreationalists. Additionally, these outcomes work to proactively convey targeted safety messages in the attempt to circumvent any potential tragedies that could occur on the water—especially those related to paddlers and freight traffic.

3:10PM

Barkers Island Beach Restoration: Bringing Water Quality and People Back to the Beach  
Heidi Saillard, Lake Superior Research Institute (LSRI) – University of Wisconsin–Superior

Over the past decade, routine sampling for E. coli at Barkers Island Inner Beach, a recreational area managed by the City of Superior in Wisconsin, resulted in a high frequency of beach advisories and closures. Restoration of the beach and recreational area was completed in July 2019 and was designed to address potential pathogen contributors identified in a 2015 and 2016 study, such as lack of infiltration, storm water runoff, and persistent presence of nuisance waterfowl. Post-restoration monitoring results presented in this lightning talk indicate increased community use, and improved water quality with fewer advisories and zero beach closures in 2019 and 2020. Continued long-term monitoring and maintenance will be vital in determining the sustained success of this beach restoration project.

3:25PM

Video: Restoring Barker's Island Beach in Superior, Matt Steiger

3:30PM • SESSION 4 CLOSE

3:35PM • MEET IN THE HALLWAY

A virtual opportunity to 'Meet in the Hallway' (a Zoom breakout room) with presenters. Use this time to ask additional questions and connect with your colleagues!

4:00-5:00PM

**VIRTUAL POSTER SESSION**

Sponsored by University of Minnesota Duluth Large Lakes Observatory and Barr Engineering

This year, the Summit poster session has also moved entirely online. The live poster session will be held from 4-5pm on Tuesday, March 2nd. You will have the chance during this hour to move through various virtual "rooms" to meet and ask questions of poster authors.

Visit the Poster Session site to view all 24 poster submissions. The site is live, and you may view posters at any time before or during the Summit. You will also find the Zoom link to join the live Poster Session on this site.

<https://sites.google.com/wisc.edu/2021-summit-poster/menu>

## Wednesday, March 3

9:00–11:00AM

**OPTIONAL FIELD TRIPS**

St. Louis River Estuary Field Trips

Sponsored by EA Engineering, Science, and Technology, Inc., PBC and Friends of Lake Superior Reserve

## **Session 5: Islands, Points, and Bays**

Sponsored by Wren Works, LLC and Wisconsin Department of Natural Resources

1:00PM • SESSION 5 INTRODUCTION

Remarks from Duluth Mayor Emily Larson

1:15PM

Analyzing Interspersion at Allouez Bay for Marsh Bird Planning  
Nathaniel Miller, Audubon Great Lakes

Audubon Great Lakes and the Wisconsin Department of Natural Resources (DNR) have taken and analyzed drone imagery at Allouez Bay with the goal of understanding the composition and structure of the eastern portion of the bay. These data and analyses will inform future restoration and management of the bay with an eye towards creating adequate habitat for breeding marsh birds. In general, Allouez Bay has moderate interspersions with several areas providing the opportunity to create more interspersions through vegetation control or establishment. We will present the details of our completed interspersions analysis and discuss the historical and recent (2020 surveys from NRRI) presence of breeding marsh birds.

1:40PM

Wisconsin Point Beach Cleanup for Birds, People and the St. Louis River Estuary  
Jim Anklam, Friends of Lake Superior Reserve

On September 26, 2020, the Friends of the Lake Superior Reserve conducted its first-ever beach cleanup on Wisconsin Point. This session will offer highlights and outcomes from that cleanup. What were our objectives for conducting the cleanup? Who were our partners? How did we attract participants and who participated? How much trash was collected and where? You will also hear a heartwarming story that emerged during the cleanup. The session will close with how the cleanup led FOLSR partnering with the City of Superior to adopt Wisconsin Point on an ongoing basis.

1:55PM

Interstate Island Avian Habitat Restoration Project: A Virtual Tour  
Gini Breidenbach, Minnesota Land Trust

Restoration of Interstate Island, home to one of the only two remaining Common Tern colonies in the Lake Superior watershed, is almost complete. The Common Terns, a threatened species in Minnesota and endangered species in Wisconsin, share the island with a colony of approximately 40,000 Ring-billed Gulls. Both species nest there each summer. Sustained high water levels in recent years combined with more severe storms had reduced available habitat on the island to almost half, causing severe predatory pressure on Common Tern eggs and fledglings from the Ring-billed Gulls. Construction of a restoration project to secure the island habitat for the Common Terns into the future began in Spring 2020. Minnesota Department of Natural Resources, Wisconsin Department of Natural Resources, Minnesota Land Trust, US Fish and Wildlife Service, University of Minnesota – Natural Resources Research Institute, and the US Army Corps of Engineers all worked together to complete the restoration, which is a management action required for removing Beneficial Use Impairment #2: Degraded Fish and Wildlife Populations for the St. Louis River Area of Concern. This presentation will provide a virtual tour of the island, focusing on the restoration efforts completed in 2020. Monitoring data from the Common Tern nesting season and shorebird stopover use from 2020 will be discussed.

2:10PM

Resilient Shoreline in Duluth, MN  
Dan Veriotti, TRC Companies, Inc.

The shoreline in Duluth, Minnesota has experienced very high water levels exceeding the 100-year event and the Lake Superior storms in 2017, 2018 and 2019 produced very significant shoreline erosion and damages to the lakewalk and boardwalk areas (popular recreational areas), along with city infrastructure. The offshore Lake Superior wave heights typically vary between 14 and 24 feet during significant storms. FEMA assisted with funding for rebuilding a resilient shoreline in Canal Park (3,000 lineal feet), which combines land-based green stormwater management measures and a new shoreline protection system (concrete wall and armor stone revetment). The project is under construction, to be completed in June 2021. The following will be presented: Coastal analysis, design, and construction phases, along with an innovative design project approach for securing stone materials from regional quarries. A summary of other completed shoreline construction projects will also be included. This series of projects brings a new perspective on—

- Selection of design criteria (water level and wave height) for coastal protection
- Resilient shoreline design
- Public access and shoreline management

2:25PM

Erosion Hazards on the St. Louis River Estuary and Minnesota Point  
Melanie Perello, Minnesota's Lake Superior Coastal Program, DNR

Minnesota's St. Louis River Estuary and Lake Superior shorelines have experienced extensive coastal erosion in recent years, due to high water levels, intense coastal storms and poor land management practices. Erosion impacts on property and infrastructure have cost millions in damages. The first step to understanding the impact of coastal erosion hazards is to locate where hazards exist. However, we lack

historic or current erosion rates in the St. Louis River Estuary or Minnesota Point. The Coastal Erosion Hazard Mapping (CEHM) project, a collaboration of local governments, state agencies and researchers, is working to create new coastal erosion maps for Minnesota. Erosion rates are calculated with the US Geological Survey's Digital Shoreline Analysis System using historical shorelines derived from aerial imagery, harbor charts, and LIDAR datasets. We will present our project to measure erosion rates along our shoreline focusing on the Estuary and Minnesota Point. We will demonstrate how these dynamic shorelines have changed since the Estuary and Harbor were first mapped in 1861 to modern, record high water levels in 2019. We will share how the shoreline has changed over time and how erosion rates have varied over time. As an example, we will show how erosion rates on particular vulnerable areas of Minnesota Point have exceeded three meters a year under recent high water conditions. These erosion rates will help our coastal communities better manage land use and ordinances to mitigate impacts from coastal hazards that threaten public and private property.

2:30PM

Video: Protecting Dunes and Restoring Piping Plover Habitat on Wisconsin Point, Matt Steiger

2:35PM • SESSION 5 CLOSE

2:40PM • MEET IN THE HALLWAY

A virtual opportunity to 'Meet in the Hallway' (a Zoom breakout room) with presenters. Use this time to ask additional questions and connect with your colleagues!

## Session 6: Below the Surface

Sponsored by UMD Natural Resources Research Institute and Great Lakes Maritime Research Institute

3:00PM • SESSION 6 INTRODUCTION

Housekeeping and etiquette overview

3:05PM

Updates from the Lake Superior National Estuarine Research Reserve

Deanna Erickson, Lake Superior National Estuarine Research Reserve

In 2020, the Lake Superior Reserve adapted to virtual work and carried out programming in new, innovative ways. As staff delve into 2021, they reflect on many collaborative successes from the last year and share plans for a resilient 2021. Updates from the Coastal Training Program, Research, Monitoring, and Education programs, as well as a preview of the launch of our Stewardship program, will highlight the ways that Summit attendees can connect to the work of the Lake Superior Reserve.

3:20PM

Decreasing the Environmental Risk Associated with Ballast Water: Updates from Great Waters Research Collaborative

Kelsey Prihoda, Lake Superior Research Institute, University of Wisconsin–Superior

Although several vectors for introduction of aquatic nuisance species (ANS) exist within the Great Lakes (e.g., organisms in trade and water recreation), it is believed that commercial shipping accounts for approximately 60% of known invasions since the opening of the St. Lawrence Seaway in 1959. Commercial vessels that operate exclusively within the Great Lakes System (i.e., Laker vessels) are not major contributors of novel invaders into the Great Lakes because less than 1% of ballast water discharged in the Great Lakes by Laker vessels originates from ports in the St. Lawrence River. However, Laker vessels do pose a risk of accelerating the secondary spread of introduced ANS within the Great Lakes. In 2020, the Twin Ports of Superior, Wisconsin and Duluth, Minnesota received over 11 million metric tons of ballast water from domestic sources, and approximately 98% of that ballast water was unmanaged. The St. Louis River Estuary is a hotspot for ANS due to the large volume of ballast water received, high frequency of ballast water discharge events, and short voyage times that ensure discharge of relatively healthy propagules. The Great Waters Research Collaborative (GWRC) is conducting projects that aim to decrease the environmental risk associated with the ballast water vector, and increase the resiliency of the St. Louis River Estuary and other Great Lakes commercial ports to aquatic invaders. This presentation will provide an update on GWRC's progress toward the goal of identifying ballast water management solutions that are effective at reducing propagules in Great Lakes ballast water. Data will be presented from recent projects, and future work under the Great Lakes Ballast Water Research and Development Plan will be discussed.

3:45PM

Quantifying Adsorption of Model Pollutants onto Various Weathered Plastics  
Raven Buckman, University of Minnesota Duluth Department of Chemistry and Biochemistry

Plastics in the environment are a global environmental problem and, once in the environment, these plastics are exposed to various environmental stressors and begin to weather or chemically transform. While in the environment, plastics, including microplastics, can act as a substrate for small molecule organic pollutants to adsorb to, which may ultimately be ingested by fish or be suspended in water bodies that are used for drinking water. The aim of our research is to quantify the adsorption of coumarin, diuron and bisphenol A (BPA) on the surface of photodegraded polyethylene (PE) and polyethylene terephthalate (PET) that have been weathered with UV light. The polymers were photolyzed with 254 nm UV light for 24, 48 and 72 hours to simulate different degrees of environmental weathering observed in natural samples. Plastics were placed in aqueous solutions with differing concentrations of either coumarin, diuron or BPA and the solution concentration was quantified with liquid chromatography (UPLC). The adsorption was observed as a decrease in the solution concentration of the pollutant and the change in concentration was modeled with a Langmuir isotherm to determine equilibrium distribution coefficients. Changes in the distribution coefficient were related to the materials properties, including hydrophobicity and surface area, and it was observed that adsorption of model pollutants is affected by a balance between chemical changes in the polymer and sites for adsorption. Through this work, we can better understand the implications for plastic waste in our environment.

3:50PM

Minnesota DNR St. Louis River Estuary gillnet survey overview: 1980–2020  
Jeremy Pinkerton, Minnesota Department of Natural Resources

The Minnesota Department of Natural Resources has conducted near-annual gillnet assessments of the St. Louis River Estuary since 1980 to monitor the Walleye population, evaluate the Lake Sturgeon rehabilitation program and gather information on other fish species. Gillnet catch rates of various species, such as Walleye, River Ruffe and Yellow Perch have changed overtime. We investigated how management changes, catch rates of other species and other biotic and abiotic factors may have contributed to these changes.

4:15PM • SESSION 6 CLOSE

4:20PM • MEET IN THE HALLWAY

A virtual opportunity to 'Meet in the Hallway' (a Zoom breakout room) with presenters. Use this time to ask additional questions and connect with your colleagues!

7:00–8:00PM

## The River Talks: A River of Poems

Sponsored by Duluth Pottery & Tile and The Izaak Walton League

During "A River of Poems," a dozen poets from around the world and across the country will read their powerful, provocative and beautiful poems about rivers – the St. Louis River or others. This event is free and open to the public. Come experience a different perspective on waterways!

The selected poets are:

Tyler Dettloff (Michigan) "My Stars"

Heather Dobbins (Arkansas) "I Held us on for 36 Hours after the Levee Broke to Hell"

Ben Green (New Mexico) "Immersion: A Prayer of Intent"

Lorraine Lamey (Michigan) "Catching Your Drift"

Joan Macintosh (Newfoundland) "The Current Feels"

Kate Meyer-Currey (England) "Timberscombe"

Rebecca Nelson (California) "Of the St. Louis River"

Stephanie Niu (New York) "To the Beaver's Eyes"

Diana Randolph (Wisconsin) "Knowing the Way"

Ron Riecki (Florida) "It Took a Long Time to Discover"

Derold Sligh (South Korea) "Rogue River"

Lucy Tyrrell (Wisconsin) "Talking Water"

Held in conjunction with the St. Louis River Summit, the reading will last an hour and will include time for comments and questions. The talk will be recorded and posted afterward on the Reserve's Facebook page and YouTube. A summary will also be posted on Wisconsin Sea Grant's blog.

<https://www.facebook.com/lakesuperiorreserve/>

<https://www.seagrant.wisc.edu/blog/>

Remaining River Talks will be held on April 14 and May 12. For more information, visit the River Talks page.

<https://www.seagrant.wisc.edu/our-work/focus-areas/education/river-talks-speaker-series/>

River Talks are sponsored by The Lake Superior National Estuarine Research Reserve and the Wisconsin Sea Grant Program.

## Summit Presentations On Demand

As we move through the Summit sessions each day, we will continue to make pre-recorded talks available to you on-demand. Visit the Presentations on Demand page to view any talks you missed or want to watch again! After the Summit, live presentation recordings will also be posted here after they are captioned.

View Presentation Videos

<https://sites.google.com/wisc.edu/summitvideos/home>