

9th Wisconsin Citizen-based Monitoring Conference

<http://wiatri.net/cbm/Conference/2020/>

March 20-21, 2020 in Manitowoc, WI

Presentation Abstracts

Friday, March 20- Workshops (1 hour)

Interactive Online Tools for Improving Monitoring and Data Sharing: An Introduction to Tableau

Anne Pearce, UW-Madison/ WI First Detector Network; Mark Renz, UW-Madison; Niels Jorgensen, UW-Madison

Citizen science programs can enhance volunteer engagement through interactive tools that improve monitoring and visualize data collected in the program. Recently Wisconsin First Detector Network (WIFDN) developed two online interactive tools to help people in Wisconsin learn about invasive species. The Wisconsin Shared Terrestrial Invasive Plant Presence (WISTIPP) Viewer is an interactive map that shows confirmed reports of invasive plants in the state, and the Wisconsin Invasive Species Calendar allows people to select parameters to develop a custom species list for monitoring. Both tools were developed on Tableau, which is free online data visualization software. In this workshop we'll explore WIFDN's tools, and participants will learn about the basics of Tableau. Through an interactive demonstration of Tableau using citizen science data, participants will gain ideas for how to use Tableau to visualize and share their own data.

Wisconsin Mussel Monitoring Program Training

Jesse Weinzinger, Wisconsin DNR; Lisie Kitchel, Wisconsin DNR

This workshop serves to train volunteers to monitor mussels, but anyone with an interest in learning more about mussels is welcome to join. Participants will learn hands-on, how to identify native mussels using shell specimens collected from Wisconsin's lakes and rivers. We will focus on distinguishing mussels with similar growth forms and the differentiating habitats they occupy. This workshop will cover the guidelines for completing a mussel monitoring survey, as well as address the latest updates on mussel monitoring and research.

Snap-A-Thon

Mackenzie Turner, Wisconsin DNR; Claire Viellieux, Wisconsin DNR

Join the Snapshot Wisconsin team in identifying Wisconsin wildlife during the WCBM Snap-a-thon! A Snap-a-thon is a friendly competition that helps people learn to identify wildlife using photos from Snapshot cameras on our crowd sourcing website, Zooniverse. The classifications you make at the Snap-a-thon directly contribute to Snapshot Wisconsin's research. All you need to bring is yourself (required) and a laptop or tablet (preferred).

Friday, March 20- Talks (15 minutes)

Winter Road Salt Monitoring in the Milwaukee River Basin and Actions to Reduce Chloride Pollution at the Source

Katie Rademacher, Milwaukee Riverkeeper

Over application of road salt can pose a very real threat to the health of our rivers and environment. Chloride, the key ingredient in road salt, can permanently pollute our freshwater systems. Acute levels of chloride have the potential to kill fish and other aquatic life instantly, while chronic chloride levels kill or harm aquatic life at lower levels over longer periods of exposure. Learn about Milwaukee Riverkeeper's hardiest volunteers who collect critical data on chloride and its impacts throughout the Milwaukee River Basin. In an additional effort to reduce chloride pollution at its source, Milwaukee Riverkeeper works with the winter road maintenance in a series of workshops focusing on road salt application best practices.

Master Naturalists as Citizen Scientists in Wisconsin

Becky Sapper, Wisconsin Master Naturalist Program, UW-Madison Extension

Learn about the growth of citizen science within the Wisconsin Master Naturalist program. The Wisconsin Master Naturalist program (wimasternaturalist.org) supports a network of well-informed volunteers and instructors dedicated to conservation service, leadership, and life-long learning. Through expert-led trainings out in nature and inside the classroom, Master Naturalists are equipped to address environmental challenges facing the state. Master Naturalists create positive impacts across Wisconsin through stewardship, citizen science, and educational activities. The Master Naturalist Training provides 40 hours of content related to geology, ecology, wildlife, plant communities, water, aquatic life, human influences, and volunteerism. After the training, individuals reporting 40 hours of volunteer service and eight hours of additional training maintain their Master Naturalist certification. Citizen science activities have been growing and this presentation will discuss the breadth of citizen science activities reported by Master Naturalists.

Tune into Nature's Seasonal Cycles. Help Track Migration with Journey North

Nancy Sheehan, UW-Madison Arboretum

Journey North is a citizen science program that engages an international audience in tracking wildlife migration and seasonal change. Launched in 1993, Journey North citizen scientists contribute over 50,000 observations each year for species such as Monarch butterflies, Hummingbirds, Barn Swallows and Red-winged Blackbirds. Migration updates shared via interactive maps, blog posts, email notifications, and social media channels help to foster excitement and participation across the North American continent – from Canada and the United States to Mexico and Central America. Journey North also offers a wide selection of inquiry-based educational materials. This citizen-generated data enhances scientific understanding of migratory species – their migration routes and habitat needs. Join this session to learn about the history of the program; project offerings; and educational resources. Most importantly, learn how you can participate in this international, citizen-science program right here in Wisconsin.

The Determination of Prey Availability for Wisconsin's American Marten: A Fall Trapping Study for Iron County

Amanda Walsh, Iron County Department of Land and Water Conservation

The American marten is the only state-listed endangered mammal in Wisconsin. Foraging ecology is an under-represented component of field research for the estimated 20 individuals that live in northern Iron County. This past fall, Iron County conservation specialist Zach Wilson and myself designed and carried out a small mammal trapping project in four distinct forested areas available to marten (cedar, hemlock, northern hardwood, and northern hardwood with

Canada yew understory). With help from high school kids from Mercer school and Hurley, we caught 44 small mammal individuals from October 28-Nov 1, 2019. This information was compared to known prey items for marten across North America and has the potential to greatly inform conservation for the species with Wisconsin.

Monitoring Karner Blue Butterfly Populations through Volunteer Efforts

Chelsea Weinzinger, Wisconsin DNR

This talk will introduce the Wisconsin DNR's Karner Volunteer Monitoring Program, methodology, and progress over the last two years. The goal of this program is to utilize volunteers to collect Karner occupancy information to get a larger picture of Karner populations. We hope to use volunteer surveys to improve our population monitoring while engaging and informing citizens.

A Clam-Atic Experience: Asian Clam Monitoring

Jayne Jenks, Waukesha County Parks and Land Use Department; Ilana Haimes, Wisconsin DNR

Asian Clams are currently listed by the DNR as verified in only 29 waterbodies in the state. Learn how to conduct a river survey for these clams and see the results from the survey on the Fox River in Waukesha County. Get tips and tricks for conducting your own surveys for target invasive species.

A Leap from a 1999 Nodding Pogonia (Triphora Trianthophora) Incidental Observation to a 2019 Rare Plant Survey

Ben Johnston, Kickapoo Valley Reserve; S. Cathy Chybowski; Megan Barker

In 1999, a forester reported the occurrence of 3 to 6 plants of Nodding Pogonia (*Triphora trianthophora*), State of WI Special Concern species, in a 3-acre wooded stand on the Kickapoo Valley Reserve. A reference to this observation was "rediscovered" in 2015, and subsequently stuck on the back burner. On behalf of the Rare Plant Monitoring Program, a 2019 KVR rare plant monitoring team set out with ambitions of relocating and counting these few 6 to 12-inch-tall plants in the 3-acre wood. In the end after three trips to the site, 400+ stems were found near the initial location, a second population of 100+ plants were "accidentally" found, and a third area was identified for future surveys. The presentation will re-tell the story of this 20 year survey, highlighting the importance of incidental observations.

Biological Effects of Digital Wireless Transmitting Meters

Margaret Majors

Digital wireless transmitting meters, AKA "smart" meters, emit radiofrequency (RF) radiation, classified by the World Health Organization as a 2B carcinogen, with negative biological effects on humans and animals, including DNA breakage, neurologic and metabolic dysfunction, cardiac arrhythmias, infertility, oxidative stress, and cancer. RF also disrupts navigational abilities of pollinators and migrators. "Smart" meter radiation can be measured up to 50 feet from the meter, and each meter sends bursts of radiation an average of 10,000 pulses per day. "Smart" meters put transient frequencies onto household wiring, creating "dirty electricity," another type of electromagnetic field with health consequences. Research will be cited and attendees will be encouraged to become more informed about this emergent environmental health issue with ramifications for humans, domestic animals, and wildlife. Resources for further information and action steps will be recommended, with the goal of raising awareness and seeding interest in a citizen-based monitoring program.

Touched by Nature

Jack Bushnell, volunteer

Inspired by various citizen science projects I've worked on, plus the Master Naturalist training I completed in summer of 2019 I will try to capture in essay style the big picture, so to speak, the spark that impels "ordinary" people (vs. trained scientists) to reach across species boundaries: to hold a chickadee, its heart thrumming beneath your fingers, while you attach a band to its leg; to flush invertebrate larvae into your net during stream monitoring, feel them wriggling and alive against your skin; to stand in awe during an annual chimney swift count, the sky dark above your head, as clouds of birds return, like smoke in reverse, to the massive stack of an old creamery; to venture out into a winter forest in wolf country, searching for tracks and behavior insights, putting your hand next to a fresh print (just to compare), feeling a little bite of adrenaline at your close proximity to such a powerful, wild predator. Half of the process of being a citizen scientist is to learn how to use our senses, to touch, to smell, to hear, to taste, to see. But the other half – the more important half I believe – is to allow ourselves to be touched. To open ourselves to all those stimuli and to be transformed by them, as fellow creatures, as fellow beings. A naturalist doesn't simply stand apart, observing or managing nature. Anyone deserving of the name "naturalist" is also of nature. Eye to eye. Skin to skin. Heartbeat to heartbeat. That's the spirit I hope to capture in my presentation.

How to Use Citizen Science to Detect Hard to Find and Difficult to Identify Species

Kevin Doyle, Wisconsin DNR

As threats from invasive species, pollinator declines, deer overabundance, climate change and other stressors increasingly make life difficult for rare plants, there is an urgent need to monitor their health, and citizen science can help meet that need. However, one of the biggest challenges to partnering with citizen scientists to survey for rare plants is that they can be hard to find and difficult to correctly identify. This talk will share lessons learned from the Rare Plant Monitoring Program, which for 6 years has been sending volunteers to relocate rare plants. I will discuss how nonprofessionals can successfully collect important data on difficult species.

Engaging and Retaining Educators in Natural Resources Monitoring

Sarah Cameron, Wisconsin DNR

Engaging educators in natural resources monitoring provides a unique opportunity to not only collect crucial data, but also to use their roles as teachers and community leaders to reach novel audiences. Snapshot Wisconsin, a Wisconsin DNR led citizen science project for monitoring wildlife, has a volunteer base comprised of nearly 25% educators who have reached over 10,000 individuals throughout their participation. Using data from Snapshot Wisconsin, we evaluated the motivations of educators for engaging in natural resources monitoring to better recruit and retain them as part of a volunteer base. Through conversations with educators and a series of surveys, we have compiled a collection of guidance and considerations, including the creation of lesson plans and other educator specific resources, for effectively engaging and retaining educators in natural resources monitoring.

Bird Collision Corps: Powerful Research by Students, Community Members, and Beyond

Brenna Marsicek, Madison Audubon Society

After completing its fourth survey period (spring and fall 2018 and 2019), the Bird Collision Corps have collected hundreds of datapoints on the locations of bird and window collisions in Madison. As one of the leading causes of bird mortalities -- killing up to 1 billion birds in the US each year -- window collisions are a big problem. Volunteers, including an innovative group of high school students, have studied the problem on a local scale with aspirations to scale up the

project and its research impact. This presentation will share the protocol and lessons learned from a high-intensity (both in terms of time and emotion) project, and how high school students are taking it to the next level.

Newly Minted: Lessons for Getting Started as a Volunteer

Marcia Obukowicz, Wisconsin Master Naturalist volunteer

Newly minted as a master naturalist, eager to get started, share my journey from newbie to useful and how it's offered some great lessons on how to move past very real challenges like living rural, northern, not knowing enough and not affiliated to an organization. Lessons include: Starting Off New: finding mentors, projects, building knowledge and skill, internet supports, completing paperwork. Finding Projects: DNR, county, local and other opportunities. Being open to the unexpected: how project can lead to projects. The outcome of this transitional experience has been how much I've learned, the great connections made with others and an awed appreciation for the complexities of gathering great data and how it leads to better management of our natural resources.

No Kitten Around, Cougars Do Show Up in Wisconsin!

Matthew Gross, Wisconsin DNR; Scott Walter, Wisconsin DNR; Jane Wiedenhoft, Wisconsin DNR

Monitoring rare mammals such as cougars causes many challenges for wildlife agencies; both in that low abundance reduces the chance of encountering animals but also that many species are cryptic or elusive in nature. We have utilized a citizen-based survey method that allows the DNR to solicit, document, and investigate rare mammal observations across the state. Learn how citizen scientists have assisted in important conservation and research efforts from monitoring resident wolf populations, documenting the presence of cougars in the state, as well as helping to document one of the longest terrestrial wildlife dispersal events known in wildlife.

A University-Community Partnership Model to Improve Regional Water Quality in Lake Michigan Watersheds

Rebecca Abler, UW-Green Bay; Richard Hein, UW-Green Bay

The waters that flow into the Great Lakes cover an extensive, varied landscape, including forests, agricultural land, cities, and suburbs. Land uses impact water quality of tributaries, ultimately affecting Lake Michigan. The University of Wisconsin-Green Bay, Manitowoc Campus and Lakeshore Natural Resource Partnership have established a robust collaboration which facilitates systematic, long-term data collection on water quality, community outreach, and watershed education. This poster presents the details of our collaboration. Student interns, mentored by faculty, collect and analyze data, coordinate with community volunteers, communicate results to the public, and mentor high school students. As students benefit from community engagement and hands-on research, their work creates opportunities for increased citizen engagement in local watershed issues, and provides data for evidence-supported decision-making. One long-term goal of this project is to engage landowners and the local agricultural community as partners, and establish EPA 9-Element Watershed Plans in these watersheds.

Bird Monitoring at Woodland Dunes and Surrounding Areas

Jim Knickelbine, Executive Director, Woodland Dunes Nature Center and Preserve

Woodland Dunes Nature Center has coordinated avian monitoring in its preserve and throughout Manitowoc County for 45 years. Included are bird banding and various bird surveys which rely on citizen-scientists for help. This presentation

will summarize migration stopover as well as pre- and post-wetland restoration monitoring and banding of northern saw-whet owls.

The Globe Program at Longfellow Middle School

Liz Ramsay, La Crosse School District

Water quality testing is a common experience for the 7th grade students at Longfellow Middle School from La Crosse, Wisconsin. Still, as a middle level educator, it's really important that I find new ways to get my students excited about science. I want them actively learning about the environment and willingly contributing as citizen scientists. This summer I stumbled across The GLOBE Program as I was searching the internet. I became a certified GLOBE teacher so that my students could connect with scientists from around the world and have a meaningful purpose to collecting data from the La Crosse River. Now my 7th grade class is GLOBE students performing the hydrosphere protocols. They are gaining a better understanding of how earth systems relate and connect, and I believe will decide how they want to take further action. It's an exciting journey that I would like to share.

Wisconsin Mussel Monitoring Program - What's Happening

Lisie Kitchel, Wisconsin DNR; Jesse Weinzinger, Wisconsin DNR

The Mussel Monitoring Program works with Citizen Scientists to gain statewide information on mussel populations that provides much needed up-to-date data on mussel distribution in wadeable streams and lakes in Wisconsin. The volunteer collected data contributes to conservation efforts and provides information to help evaluate the statewide status of individual species. We offer programs, workshops and ongoing trainings, and welcome new individuals and groups interested in learning about our 50 species of native mussels. Volunteers are trained in the field in the collection and preliminary identification of shells. Live mussels are photographed and returned to the stream or lake and photos submitted for verification. Dead shells can be photographed and/or kept for reference collections. Identifications are verified by an expert. Since the Program started in 2009 it has created a network of active enthusiastic volunteers. Come and join us and thanks to all the volunteers!

Saturday, March 21- Workshops (1 hour)

Promoting Frog and Toad Survey Single Wetland Phenology Survey

Ben Johnston, Kickapoo Valley Reserve; S. Cathy Chybowski; L. Sarah Chapman

In an attempt to promote the WI Frog and Toad Single Wetland Phenology Survey, The Call of the Frog presentation was developed for general audiences (i.e. libraries, school groups, baby showers) to educate the attendees of the calls for 12 species of Anura in the state. Furthermore, The KVR's Frog Walk Tuesday has been going strong for four years. This weekly evening walk (late March to mid-July) contributes data to the WFTS single wetland phenology survey. Additional night sounds heard and plant ID by moonlight have developed the weekly frogging event to a nighttime "nature walk". This workshop will provide an overview of The Call of the Frog presentation, demonstrations of mnemonics, share resources for developing your own Frog program, and report on the "success" from 4 seasons of Frog Walk Tuesday.

Citizen Science Open House as a Model for Public Engagement

Jessica Ross, UW-Madison Arboretum

The University of Wisconsin Arboretum held its first Citizen Science Open House in the summer of 2019 with a goal of reaching and engaging a broad audience with citizen science projects. Our open house reached over 100 individuals and featured 12 citizen science projects, in a combination of indoor exhibits and outdoor, hands-on activities. We will discuss the planning and partnership-building steps that we took to implement our open house and present lessons learned during the process. We will also offer recommendations, resources, and opportunities for collaboration for others interested in hosting their own citizen science open house in the future.

Bumble Bee Identification

Jay Watson, Wisconsin DNR; Eva Lewandowski, Wisconsin DNR

The Wisconsin Bumble Bee Brigade is a one of the DNR's newest citizen-based monitoring project. We're partnering with the public to improve our understanding, management, and conservation of Wisconsin's 20 native bumble bee species, many of which are in decline. Bumble bee identification in the field and with photographs is key to the success of the project. Learn about the basics of bumble bee identification, tips for tricky IDs, and resources available to help you identify the species and sex of the bumble bees you see. We'll also discuss how you can get involved in the Bumble Bee Brigade!

Saturday, March 21- Talks (15 minutes)

Introducing Nectar Sources for Endangered Pollinators, and Using Bumble Bee Brigade to Identify Restoration Successes

Emily Peters, UW-Whitewater-Sustainability Office

Lupine is famously known as the host plant to the endangered Karner Blue Butterfly in Wisconsin, but it has also been found to be beneficial to other pollinator species such as the Rusty Patched Bumble bee, and has been added to the list of plants to attract the Rusty Patched Bumble Bee as well. Since the UW-Whitewater Sustainability Office started practicing Bumble Bee Brigade sessions this fall, we want to expand on our volunteer sessions. We are introducing

lupine back to our nature preserve to create a habitat for potentially both of our native and endangered pollinators. We have also been using outreach and educational strategies and events to help educate our student body about these endangered pollinators.

Wild in Waukesha: The Launch of a New, County-Wide, Citizen Science Initiative

Julia Robson, Waukesha County Parks and Land Use; Erica Gerloski, Waukesha County Parks and Land Use

The Waukesha County Park System is home to over 9,000 acres of parkland nestled within a landscape that is mottled in unique glacial features and a fascinating blend of Wisconsin's vegetative communities. Actively monitoring, managing, and also engaging the community in the conservation of the park systems ecologically diverse resources is of the utmost importance in effectively preserving them for generations to come. In 2019, the Waukesha County Park System laid out and implemented a framework for a citizen-based monitoring program with a multi-taxa focus for the entire county. This program included projects such as wetland monitoring, nest box monitoring, snake surveys, acoustic bat surveys, bird surveys, turtle surveys, odonate surveys, bumble bee surveys, and butterfly surveys. This presentation will give an overview of notable results from year-one, lessons learned, and the process behind establishing the strategic partnerships with outside organizations and subject matter experts that were aligned in order to accomplish multiple monitoring goals across a variety of taxa.

Beginning A Life Long Citizen Science Journey

Carol Labuzzetta, volunteer

After founding a school-based garden club in 2004, Environmental Educator, Carol Labuzzetta began searching for ways to connect her students to the world around them. One of the group's first projects was to convert an old, unused perennial bed to a Butterfly Garden on school grounds. By 2006, Carol was using both her gardens at home and at school to report phenological observations on monarchs and milkweed to Journey North. Intrigued by the user-friendliness of the Journey North website, Carol began introducing her students to the field of Citizen Science using her own reported data as examples. Now, fifteen years later, Carol speaks to school and community groups on environmental topics of interest, including how they, too, can become citizen scientists. Documenting years of observations on Journey North has helped Carol and others understand the amazing, yet changing natural world, that surrounds us all.

From Classroom to Conservation: Citizen Science at Schlitz Audubon Nature Center

Corinne Palmer, Schlitz Audubon Nature Center; Aubrey Ellickson, Schlitz Audubon Nature Center

Beginning with bird counts nearly 50 years ago, Citizen Science has benefited the overall strategic mission at Schlitz Audubon Nature Center in Milwaukee, Wisconsin. Dedicated education and conservation staff, working alongside our knowledgeable volunteers, helped to grow the program into over twenty citizen science projects. Schlitz Audubon participates in projects like FrogWatch USA, Monarch butterfly monitoring, and Alliance for the Great Lakes Adopt-a-Beach program. The Center is also incorporating citizen science into the preschool, elementary, secondary, and public education programs. The results of these projects have shaped land management goals while advancing community involvement. This presentation will explore the past, present, and future of developing successful citizen science programs at Schlitz Audubon Nature Center.

Wisconsin Turtle Conservation Program

Andrew Badje, Wisconsin DNR

The Wisconsin Turtle Conservation Program was initiated to catalogue existing turtle crossing (i.e., roads and railroads) locations throughout the state, so road agencies, maintenance crews, wildlife biologists, and citizen conservationists can work together to make passages safer for turtles and other wildlife. We will describe the achievements to date and show where the Wisconsin Department of Natural Resources plans to take this program in future years. See how easy it is to volunteer for the Wisconsin Turtle Conservation Program, and learn how your contributions can revolutionize the way we conserve turtles in Wisconsin.

Managing for Data Quality in A Growing Project

Emily Buege, Wisconsin DNR

Data quality is a primary concern for citizen science projects, which aim to produce reliable and useful results. As a project grows, ensuring data are collected in a consistent manner can become increasingly difficult. Snapshot Wisconsin, a trail camera project which has expanded to include over 2,000 cameras, continues to learn how to best manage for quality data. Here we share key components of consistent data collection as outlined in a recent publication, which offers insights into launching and managing a large citizen science project and uses Snapshot Wisconsin as a case study. We provide examples of how communications with volunteers can be leveraged to better ensure data quality and where we have implemented stops to identify and repair problematic data.

Wireless Radiation Damaging and Killing Trees: Monitoring Needed to Guide Policy Development

Catherine Kleiber

Studies show radiofrequency/microwave radiation emitted by wireless technology can damage and kill trees. Wireless radiation can inhibit fall anthocyanin production and cause necrotic lesions on leaves. Wireless radiation can also cause graying or yellowing of leaves, as well as untimely color change. It can cause leaves on the outside of the crown to be small and misshapen. Wireless radiation is known to cause DNA breakage, oxidative damage, and inappropriate activation of voltage-gated ion channels. It can increase populations of tough pathogenic bacteria, while simultaneously decimating beneficial microbe populations, including nitrogen-fixing bacteria. Wireless communication consumes at least ten times more energy than wired communication to send the same information. A radiofrequency/microwave radiation monitoring program is needed to guide development of a Wisconsin wireless policy that protects the environment and public health.

Volunteering with the Cerceris Wasp Study in Wisconsin

Paul Doxsee, WI Master Naturalist and WIFDN volunteer; Art Wagner, USDA-APHIS-PPQ

We will present the biology and mechanics of doing Cerceris Wasp surveys to identify metallic borer beetle activity in an area. Special emphasis is on identification of invasive species like Emerald Ash Borers. The presentation will cover the biology of Cerceris wasps, the USDA borer beetle program, the volunteer experience under the program and program results with volunteer efforts.

The Need for More Plant-Focused Citizen Science Projects

Kevin Doyle, Wisconsin DNR

Wisconsin has established citizen science projects focused on both invasive plants and rare plants, but other than property-specific species lists there are few projects focused on common native plants. Since invasive and rare plants account for only 40% of the state's flora, there is a great need to monitor common native plants. This talk will review one statewide botanical project, The Wisconsin Botanist Big Year, highlighting the outcomes, benefits, and challenges and conclude with a discussion of potential future botanical citizen science projects.

The Tick App: Balancing Education, Public Health Messaging and Research to Understand Human Behavior and Tick Encounters

Bieneke Bron, UW-Madison; Lyric Bartholomay, UW-Madison; Susan Paskewitz, UW-Madison

Over the past 50 years, Lyme disease cases increased from none to 30,000 per year in Wisconsin. Researchers understand where ticks that spread Lyme disease, deer ticks, live and what can be done to reduce the chance of a tick bite. However, we do not know how well these methods work in real-life. In 2017, The Tick App was developed as a citizen science tool to better understand how human behavior and tick encounters are related. It was a collaborative process, whereby app content was developed to engage and educate users, and to complete our research goals. During the first year, 2018, research focused on a retrospective survey (663 Wisconsin submissions), the next year we targeted outdoor activity diaries including tick prevention (445 Wisconsinites submitted 4689 diaries), and in 2020 we will test an intervention. We will discuss our lessons learned and core findings.

The Future Is Now: Citizen Science in the Kindergarten Classroom

Peter Dargatz, Woodside Elementary

Citizen Science is a wonderful way to connect children to the natural world in a meaningful and memorable way. This presentation will describe how a kindergarten classroom uses various citizen science projects to build a love of learning, strengthen cross-curricular integrations, build community partnerships, and nurture the next generation of environmental stewards.

Retaining Volunteers in a Long-Term Wildlife Monitoring Project

Jamie Bugel, Wisconsin DNR

Many citizen science projects rely on the donated time of volunteers. These volunteers contribute to data collection, aid in processing large data sets, and recruit new volunteers within their communities. This presentation highlights initiatives used to recognize volunteers for their efforts and improve volunteer retention. We leverage lessons learned from Snapshot Wisconsin, a volunteer-based wildlife monitoring network of trail cameras throughout the state, with over 1,700 active volunteers. We share outcomes of an internal program evaluation, including a survey of volunteers after one year of participation, n=206, and how these results can inform objectives and goals for volunteer retention. We also illustrate strategies used to engage geographically remote volunteers and describe impacts of creating a robust volunteer community on both data collection and participant satisfaction.

CRIKT Revisited: Citizens Researching Invertebrate Kritters Together

Tim Vargo, Urban Ecology Center

In 2014, the Wisconsin Citizen Based Monitoring Network awarded seed money to the Urban Ecology Center in Milwaukee to create a long-term invertebrate monitoring plan as urban natural areas have focal spaces that are likely important pockets of habitat for many invertebrates. Over 30 community scientists collaborated in producing the first phase of that plan. Five years later we revisit the processes that went into making the plan, the results that came out of it and our plans to keep it relevant, adaptive and truly long-term. This plan can help us determine the diversity and abundance of key invertebrates at the Center's three parks and gauge the impact that our stewardship and restoration activities have on our invertebrate communities.

Supporting Citizen-Based Monitoring: Educational Materials

Susan Carpenter, UW-Madison Arboretum

Citizen-based monitoring is an essential and powerful way to address important ecological and conservation questions. People engage directly with projects, attend trainings, and contribute data. In addition, monitoring projects also benefit from broader awareness and support. To pique and deepen public interest in the issues and systems we monitor, we also create and share diverse learning formats and materials. We illustrate these ideas through an 8-year bumble bee monitoring and science-based educational program at the UW–Madison Arboretum that introduces the questions, content, and practices of bumble bee monitoring and conservation. We employ appealing materials, interactive activities, garden tours, open houses, and workshops to address: challenges pollinators face, bee biology and ecology, ID characteristics, bumble bee photography, and how to help bumble bees. Nature centers, schools, community centers, gardeners, and landowners may use and adapt these materials for their own use.

Working with Colleges to Train Students and Do Ecological Restoration

Jared Urban, Wisconsin DNR

The staff and volunteers of the State Natural Areas volunteer program have had the chance to partner with college classes and clubs to get on the ground invasive removals accomplished. This has varied from students showing up to help us at workdays to putting on a specific college class. We'll discuss what we have done and what we have learned through these experiences.

Bats: Status Update and Monitoring

Paul White, Wisconsin DNR

The presentation will outline the current state of white-nose syndrome, a disease impacting bats, in Wisconsin and mitigation efforts related to the disease. A summary of the bat-related citizen-based monitoring projects will also be discussed.