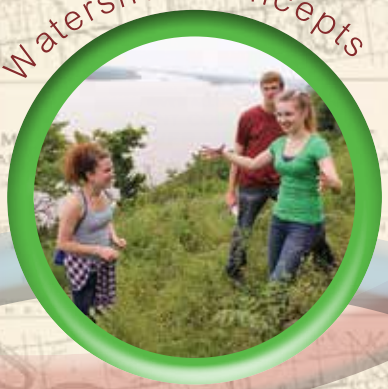
The National Great Rivers
Research & Education Center

Mississippi River Watershed Education Symposium

November 14 & 15, 2014

Lewis and Clark Community College

Godfrey, Illinois



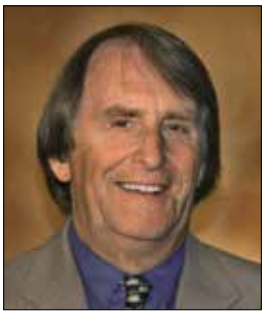
Science, Technology Engineering and Math (STEM)

LEWIS&CLARK COMMUNITY COLLEGE

ILLINOIS
UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

ILLINOIS NATURAL HISTORY SURVEY
PRAIRIE RESEARCH INSTITUTE

WELCOME from Dr. Gary Rolfe



Few ecosystems are as closely linked with the development of human civilization as great rivers, and few ecosystems have been as greatly altered by humans. Sustaining both the ecological and economic health of the Mississippi and other great rivers requires research that addresses critical areas such as invasive species effects on native biota, habitat restoration, nutrient fluxes and strategies to reduce inputs to marine systems. The National Great Rivers Research and Education Center (NGRREC[SM]) located at the confluence of the Mississippi,Illinois, and Missouri rivers and in the heart of the Mississippi River Watershed, is ideally situated to fulfill its mission – the study of the ecology of big rivers, the workings of the watersheds that feed them, and the ties to the river communities that use them.

NGRREC[SM] has solid research and education programs and state-of-the-art facilities to address critical issues within the watershed. NGRREC[SM] affiliates with the Illinois Natural History Survey have been collecting water quality and fish data on the Upper Mississippi River System for over 15 years. We are expanding our monitoring and research activities into new locations on the Mississippi, Illinois, and Missouri rivers, and extending research and monitoring to the terrestrial habitats of these great rivers. Our scientists are working with the YSI Corporation to create a network of monitoring buoys capable of real-time, continuous collection of water quality and phytoplankton data. This effort will begin on the Mississippi, Missouri, and Illinois rivers, with plans to expand to other great rivers throughout the world, creating a Great Rivers Ecological Observatory Network (GREON[SM]).

Given its location, focus, and partners, NGRREC[SM] is ideally positioned to connect the watershed research that extends from the Great Lakes to the Gulf of New Mexico. An important facet of our mission is to support policy deliberations with reliable data and knowledge. Thus, NGRREC[SM] and partners are launching the Great Lakes to Gulf Virtual Observatory (GLTG[SM]) Initiative to expedite the data-to-knowledge-to-policy connections. Initial efforts will also consider real time reporting and visualization of nitrate data from GREON[SM], within a cyber-infrastructure framework in collaboration with the National Center for Supercomputing Applications and Illinois Indiana Sea Grant at the University of Illinois. The early phases of the initiative are being funded by the Walton Family Foundation and the State of Illinois.

This past year has seen tremendous growth. Three new scientists have been hired to bring new areas of expertise to the program. Michael Brennan M.S. was hired as the water quality outreach specialist to assist with the GLTG[SM]. His extensive experience working with complex database architectures, involving the National Center for Supercomputing Applications, allows him to draw on skills needed to develop the GLTG[SM.] Dr. John Crawford joined the program this past summer and will be establishing the terrestrial wildlife ecology program. His area of focus is at the interface of aquatic and terrestrial ecosystems examining the impacts of land use and climate change in riparian areas. Dr. Anthony (Tony) Dell comes to us from the Department of Biology at the University of Göttingen (Germany) as the center's macro-invertebrate ecologist. Tony desires to make NGRREC[SM] and his lab a global hub for automated vision research in ecology with a larger vision to develop a network of collaborative laboratories that share resources.

On the education front, Allison Rhanor is the newest member of our environmental education team. Allison's background with stream ecology and her passion for bridging science and public engagement make her an ideal fit for NGRREC's education program. NGRREC's contributions through research, education, and public engagement will provide scientists, lawmakers, and the public with critical knowledge to help us manage and sustain our great floodplain rivers, the watersheds that feed them, and the communities that depend on them. I hope your takeaways from this meeting are meaningful and I encourage you to continue your commitment in providing inspiration for future generations of stewards of our great rivers and their watersheds.

Dr. Gary Rolfe, Executive Director, NGRREC

The National Great Rivers Research & Education Center

One Confluence Way, East Alton, Illinois • www.ngrrec.org • 618-468-2900

WELCOME from Natalie Marioni

As our name indicates, the National Great Rivers Research and Education Center (NGRREC) places a strong emphasis on education, reaching over 3,500 students and educators annually with our various programs. Many people equate NGRREC's education program with our long-standing fifth grade Water Festival and Summer College Internship program. However, NGRREC is committed also to providing professional development and training as well as generating dialogue and collaborations to further education and outreach efforts. That is the aim of this symposium.

This event marks NGRREC's eighth in a series of public conferences and symposia, and the first with an education focus. We understand that to reach a broad spectrum of audience members with river- and watershed-focused messaging that is both rooted in sound science and results in a more informed and more involved citizenry, you need to bring educators together with other watershed stakeholders. The Mississippi River Watershed Education Symposium provides an opportunity for both formal and non-formal educators who have an interest in infusing watershed topics into their programming to network and participate in open discussion with other professionals. The goal of these interactions is to inspire and develop unique collaborations on important topics around watersheds.

We are only able to host an event that allows us to meet these goals with the help from our generous sponsors and the logistical support from key people on and off campus. Please let me extend special and sincere thanks to Dr. Gary Rolfe, NGRREC Executive Director; Dr. Dale Chapman, L&C President; and Bill Kruidenier, NGRREC Associate Director, for their varied support to ensure a successful symposium. Finally, conference co-chair Crystal Bartanen, the NGRREC education team, and conference planning committee all provided invaluable contributions to this symposium and without this team, this event would not have been possible.

Natalie Marioni, Environmental Education Manager, L&C and NGRREC
nmarioni@lc.edu

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- Southwestern Illinois College
- University of Illinois Department of Natural Resources and Environmental Sciences

CONFERENCE COMMITTEE PLANNING MEMBERS

- Co-Chair, Crystal Bartanen, Program Administrative Assistant, NGRREC
- Patti Brown, Education Director, The Nature Institute
- Mary Culler, Regional Office Watershed Coordinator, Missouri Department of Natural Resources
- Tracy Haag, Regional Office Watershed Coordinator, Missouri Department of Natural Resources
- Co-Chair, Natalie Marioni, Environmental Education Manager, NGRREC
- Allison Rhanor, Environmental Educator, NGRREC
- Ted Kratschmer, Field Station Manager and Science Liaison, NGRREC
- Amanda Patrick, Public Affairs Officer, US. Forest Service - Shawnee National Forest
- Angie Smith, Natural Resources Specialist, U.S. Army Corps of Engineers St. Louis District

LEWIS AND CLARK COMMUNITY COLLEGE STAFF ACKNOWLEDGMENTS

Dr. Dale Chapman, President and NGRREC Board Chair
Janet Borror, Assistant Director, Campus Events
Tammy Childers, Division Assistant, Math, Science and Technology
Natalie Coleridge, Administrative Assistant, NGRREC
Dr. Sue Czerwinski, Dean of Math, Science and Technology
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Hannah Schallenberg, Catering Specialist, Dining Services
Dawn Zedolek, Coordinator Continuing Education and College for Kids
L&C Facilities Department

KEYNOTE SPEAKERS

Utilizing Technology in Citizen Science to Expand Educational Opportunities

Sean O'Connor is the program manager of educational mapping for National Geographic Education. His experience with educational mapping includes designing maps and interactive map technologies for a range of audiences. His work also involves a strong outdoor education component, helping educators understand best practices in using technology inside and outside of the classroom to enhance field learning experiences.

Helping to Clean America's Rivers: From the Bottom Up

Chad Pregracke is the president and founder of Living Lands & Waters (LL&W), the world's only "industrial strength" not-for-profit river cleanup organization. Chad formed LL&W at the youthful age of 23, after spending his life growing up and working on the Mississippi River. Early on, he became appalled by the amount of garbage in the river and decided that if no one else was going to do something about it, he would. Over the last 16 years, he, his crew and nearly 70,000 volunteers have removed more than seven million pounds of garbage out of our nation's rivers. He's also broadened his mission to include a MillionTrees and an Adopt-A-River Mile Project, as well as a new floating classroom aboard a barge that he and his crew live on seven months out of the year, teaching students, educators and individual citizens about the value of our rivers and natural resources. Most recently, Chad was named the 2013 CNN Hero of the Year.

AGENDA

FRIDAY, November 14, 2014

8 a.m. Registration Check-in and Refreshments

Location: Lobby, Trimpe Advanced Technology Center (TR), Lewis & Clark Community College

8:50 a.m. Welcome – Natalie Marioni

National Great Rivers Research & Education Center

Location: TR 141

9 a.m. KEYNOTE PRESENTATION

Utilizing Technology in Citizen Science to Expand Educational Opportunities

Sean O'Connor, National Geographic

Location: TR 141

10 a.m. CONCURRENT SESSION A

1) *Having the Science is Not Enough*

Bob Broz, University of Missouri Extension Water Quality

Location: Robert L. Watson Math Building (MA) – Room 308

2) *The Ripple Effect: How One Fish Story Inspired a Community*

Liz Ettelson and Leah Holloway, Park District of Highland Park

Location: MA Room 310

3) *Veterans Curation Program: Archiving Artifacts for Education*

Catherine McMahon, U.S. Army Corps of Engineers St. Louis District

Location: MA Room 311

11 a.m. CONCURRENT SESSION B

1) *Place-based Learning about the Mississippi River to Support Teacher Implementation of the Next Generation Science Standards*

Sharon Locke et al., Southern Illinois University Edwardsville

Location: MA Room 308

2) *Wetlands: Nature's Answer to Mississippi River Water Quality Concerns*

Lisa Chambers, St. Louis University

Location: MA Room 310

3) *Lessons on River Sustainability*

Amy McCoy, Living Lands & Waters

Location: MA Room 311

STRANDS

- Civic Engagement and Sustainability
- Cultural History
- Natural History and Environmental Education
- Science, Technology, Engineering and Math (STEM)
- Watershed Concepts

FRIDAY, November 14, 2014 (continued)

Noon LUNCH (provided)

Location: TR 141

1 p.m. CONCURRENT SESSION C

1) *Stream Discovery – An Outdoor Classroom Experience Meets Real World Data Entry: A Water Quality Monitoring Program for Educators*

Matthew Young and Allison Rhanor, NGRREC

Location: Meet in MA 308. Workshop will be held in Haskell Hall B05

Duration: Noon to 5 p.m. The workshop will include a boxed lunch.

Workshop Description: The Stream Discovery program provides students grades 5-12 with the opportunity to assess water quality in their community by monitoring macroinvertebrates in a local stream. Students, school and youth groups can all develop a deeper connection with their natural environment by monitoring and protecting a special stream. Monitoring involves a habitat, chemical and biological survey of a local, wadeable stream. Water quality data are then uploaded to National Geographic's FieldScope mapping and data platform for comparison with student data in other Illinois watersheds. This workshop includes a program overview and identification of water quality indicator species (aquatic macroinvertebrates) before moving to a local stream for hands-on field training. Workshop fee covers the cost of monitoring materials and instructional resources.

2) *Our Mississippi - Bringing River Resources to You*

Erin Hilligoss-Volkmann, U.S. Army Corps of Engineers

Location: MA Room 310

Duration: 1 p.m. - 5 p.m.

Workshop Description: The Our Mississippi curriculum was developed in partnership with the U.S. Army Corps of Engineers and educators along the Upper Mississippi River System and combines concepts in life sciences, social sciences, mathematics and fine arts into a place-based resource to augment both formal and non-formal education settings. While the curriculum is specific to the Upper Mississippi River and its watershed, many concepts can translate and be used for other river systems. Workshop coordinators will present key components from the 5th-6th grade curriculum, showcase hands-on activities, and discuss activity modifications for upper and lower grades.

3) *Area Tour*

Ted Kratschmer, NGRREC

Location: Meet in TR 141

Duration: 12:45 p.m. - 5:30 p.m.

Tour Description: Visit various area sites important in the context of Mississippi River ecology, culture, and navigation/engineering. The area tour includes visits to the NGRREC Costello Confluence Field Station, Audubon Center at Riverlands, U.S. Army Corps of Engineers National Great Rivers Museum and Melvin Price Lock and Dam, and Cahokia Mounds State Historic Site.

FRIDAY, November 14, 2014 (continued)

5 p.m. POSTER SESSION & RECEPTION

Location: TR Room 141

6 p.m. DINNER (provided)

Location: TR Room 141

6:30 p.m. KEYNOTE PRESENTATION

Helping to Clean America's Rivers: From the Bottom Up

Chad Pregracke, Living Lands & Waters

Location: TR Room 141

Living Lands & Waters barge

AGENDA

SATURDAY, November 15, 2014

8 a.m. REGISTRATION CHECK-IN AND REFRESHMENTS

Location: TR Room 141

9 a.m. CONCURRENT SESSION D

1) *Exploring the Use of Publicly Available Scientific Data in the Classroom*

Ted Kratschmer, NGRREC

Location: MA Room 308

2) *The River Run: Professional Development with a Splash of Technology*

Dr. Gillian Roerhig and Justin McFadden, University of Minnesota – STEM Education Center

Location: MA Room 310

3) *Illinois Master Naturalists Help Others Connect with Nature*

Rhonda Ferree, University of Illinois Extension

Location: MA Room 311

10 a.m. CONCURRENT SESSION E

1) *Perspectives on Archeological and Ecological Education*

Dr. Carol Colaninno, Center for American Archeology

Location: MA Room 308

2) *Model My Watershed*

Nanette Marcum-Dietrich, Millersville University

Location: MA Room 310

SATURDAY, November 15, 2014 (continued)

3) *Planting the Seeds for Regional Sustainability*
Kim Petzing, Madison County Government, Planning and Development Department
Location: MA Room 311

11 a.m. CONCURRENT SESSION F

1) *The Ohio River STEM Institute: A University-Community Partnership Bridging STEM Disciplines, Student Monitoring and Environmental Stewardship*
Heather Mayfield, Foundation for Ohio River Education
Location: MA Room 310
Duration: This session is from 11 a.m. to 11:30 a.m.

2) *Floodplain Simulation Model: A Hands-on Demonstration for Watershed and Floodplain Education and Outreach*
Amanda Flegel and Brian Chaille, Illinois State Water Survey, Association for Floodplain and Stormwater Management
Location: MA Room 311
Duration: This is a free-form session and you can stop by for a demonstration any time between 11 a.m. and noon.

3) *Watershed Cairns: Water Marked with Art*
Libby Reuter, Missouri Coalition for the Environment, Heartlands Conservancy
Location: MA Room 308
Duration: This is a free-form session and you can stop by to view and discuss the Watershed Cairns anytime between 11:00 a.m. and noon.

Noon LUNCH (provided)
Location: TR Room 141

STRANDS

- Civic Engagement and Sustainability
- Cultural History
- Natural History and Environmental Education
- Science, Technology, Engineering and Math (STEM)
- Watershed Concepts

SATURDAY, November 15, 2014 (continued)

1 p.m. CONCURRENT SESSION G

1) *Aquatic WILD . . . Splash Into Me*

Jennifer Tariq, Douglas-Hart Nature Center and Project WILD

Duration: 1 p.m. - 5 p.m.

Location: MA Room 210

Description: Aquatic WILD uses the simple, successful format of Project WILD activities and professional training workshops but with an emphasis on aquatic wildlife and aquatic ecology. Every participant will receive the newly revised 2013 edition of Aquatic WILD. This 396-page K-12 curriculum and activity guide is full of hands-on activities and investigations. Workshop fee covers the cost of the Aquatic WILD curriculum and activity guide.

2) *Creek Freaks: Hands-on Stream Science with Digital Learning*

Erin Johnson, Isaak Walton League of America

Duration: 1 p.m. - 5 p.m.

Location: MA Room 310

Description: This presentation will demonstrate hands-on activities from the curriculum, use of the interactive website, and discussion on how Creek Freaks can be used to engage children in citizen science, stream restoration, and community outreach. Participants will have a first-hand opportunity to conduct some of the activities from the curriculum and to see how the interactive website works. Participants will receive curriculum materials and will learn how to sign up or host future training workshops.

3) *River Island Cleanup*

Chad Pregracke, Living Lands & Waters

Duration: 1 p.m. - 5 p.m.

Location: Meet in TR 141

Description: Help keep the Mississippi River clean by participating in a river island cleanup with the Living Lands & Waters (LL&W) crew. Cleanup participants will load up into LL&W work boats and head out to sites along the shores of various river islands. Once there, the search for garbage is on. The cleanup will last for about three hours. Don't fear the November weather - warm layers and an interest in being a steward of our watershed is all that's needed!

5:15 p.m. ADJOURN

STUDENT POSTER SESSION

Location: TR Room 141

1. *Internship in Science Education in Informal Settings*

   Rosa Schulz, Southern Illinois University Edwardsville (SUIE), Edwardsville, IL

2. *Analysis of Climate Change Misconceptions of Students*

   Raneen Taha and **Ben Legel**, SIUE, Edwardsville, IL

3. *Analysis of Climate Change Misconceptions: The Teacher Perspective*

   Brooke Kottkamp and **Jennifer Sparks**, SIUE, Edwardsville, IL

4. *Flood Risk Near River Confluences*

   Lisa C. Andes and **Daniel M. Hanes**, Saint Louis University (SLU), St. Louis, MO

5. *Challenges and Solutions for the Future Sustainability of Missouri Reservoirs*

   Kaveh S. Nia and **Amanda L. Cox**, SLU, St. Louis, MO

6. *Knowing the Enemy: Cultural Requirements for Germinating Invasive Japanese Hops in Experimental Situations*

   Jonathan Clark and **Kurt Schulz**, SIUE, Edwardsville, IL

7. *Comparative Assessment of the D-Frame Kick Net, Wildco Bottom Aquatic Net, Seine Net, and Hester Dendy Sampling Devices*

   Justin Wallace, Joliet Junior College (JJC), Joliet, IL

8. *Water Quality Based on Macroinvertebrate Taxa Found with Special Focus on Riparian Zones Studied*

   Brandi Martyka, JJC, Joliet, IL

9. *Establishing Schmidtea mediterranea as a Model to Study Nanoparticle Toxicity in Freshwater Systems*

   Morgan Rakers, **Amy Hubert** and **Chris Theodorakis**, SIUE, Edwardsville, IL

10. *Effects of Shell Orientation on Hydrodynamic Drag in a Freshwater Snail*

    Luke Winebaugh and **Paul Brunkow**, SIUE, Edwardsville, IL

11. *Geometric Morphometrics of the Black Spotted Topminnow Across the River Continuum*

    Eric Westhafer[1], **Jake Schaefer**[2], and **David Duvernell**[1], [1]SIUE, Edwardsville, IL; [2]University of Southern Mississippi, Hattiesburg, MS

PRESENTERS

Bob Broz

University of Missouri Extension Water Quality, Columbia, MO

BIO: Bob Broz has a background in production agriculture and education. He started at the University in 1993 for the Extension Water Quality Program. He presently supervises the program that works with many aspects of water quality education. He has been involved with multiple projects, including writing or assisting with grants totaling more than $10 million in funding since 2000, has coordinated several state-wide training courses, works as a liaison between agency partners and the University of Missouri and serves as a resource for water quality and environmental projects throughout the state.

Having the Science is Not Enough

ABSTRACT: Everyone wants to base watershed management decisions on science and research-based information. But is presenting the research-based information the best way to get people to implement practices or change their behavior? Recognizing where landowners and citizens are in their understanding of issues and even their learning styles helps us determine how to approach different audiences. Research has helped us determine which management practices are most effective at reducing erosion, nutrient runoff and pesticide runoff. Research is now revealing that there are barriers that reduce the willingness of landowners to adopt management practices. After working with watershed groups for over 15 years, the process is not as simple as providing research-based information that will benefit water quality and the environment. Understanding the social attitudes, barriers and societal trends may play a larger role in decision-making and adoption of management practices than most people ever thought. Understanding what these barriers are and working with local producers to obtain buy-in to a project can yield long-term water quality benefits. Hypoxia in the Gulf of Mexico is a prime example of trying to get people to understand the issues of nutrient loss and potential reduction while still keeping food production levels and profits high. Learning the barriers and learning what works with landowners are two parts of the solution that ties directly in with the research-based information that is critical. Education and understanding of the issues and the role of producers and landowners is vital for helping people make decisions that are economically viable and environmentally sound.

Lisa Chambers

Saint Louis University, St. Louis, MO

BIO: Lisa Chambers is an Assistant Professor in the Department of Earth and Atmospheric Sciences at Saint Louis University. She teaches graduate and undergraduate courses in environmental science, geochemistry, soils, wetland ecology, and biogeochemistry. Her research focuses on the use of wetlands to improve water quality, soil chemistry, and the impacts of sea level rise on coastal ecosystems. She has a PhD in Soil and Water Science from the University of Florida and a Masters in Oceanography and Coastal Science from Louisiana State University

Nature's Answer to Mississippi River Water Quality Concerns

ABSTRACT: Wetlands are often referred to as the kidneys of our landscape because of their innate ability to filter, assimilate, and transform nutrients and other pollutants. The high rate of primary productivity, extensive contact between the soil and water, and presence of plants creates the ideal conditions for wetlands to remove excess nitrogen and phosphorus from the Mississippi River, as well as degrade chemical pollutants, ultimately enhancing water quality in the watershed. This presentation will discuss the history of wetland drainage in the Mississippi River watershed, why wetlands are so important to ecological sustainability, and recent efforts to recreate (or reconnect) wetlands to the river in an effort to improve water quality. A case study from the Mississippi River delta region will be presented in which a freshwater diversion wetland was successfully created to remove nitrate, combat coastal land loss, and reduce the growing "dead zone" in the Gulf of Mexico caused by nutrients in the Mississippi River.

Carol Colaninno

Center for American Archeology, Kampsville, IL

BIO: Dr. Carol E. Colaninno is the Director of Education at the Center for American Archeology in Kampsville, IL, where she has held this position for the past two years. The CAA is an independent 501(3)(c) not-for-profit organization dedicated to education, research, and public service in archeology that has been a long-standing and active force in the documentation, reporting, and preservation of ancient human-environmental interactions. Dr. Colaninno manages a unique offering of educational programs that include experiential learning opportunities for grade school students to lifelong learners.

Perspectives on Archeological and Ecological Education

ABSTRACT: Humans have been active participants in the Illinois and Mississippi River watersheds for more than 10,000 years, yet researchers and educators often fail to account for this deep-time, dynamic human-environmental relationship. Given the deep history and significance of human actions in this region, archeological and ecological education and research should contextualize present-day systems within long-term perspectives that consider human social systems in conjunction with natural systems dynamics. The CAA, with over 60 years of institutional commitment to archeological education, provides a range of innovative and experiential educational opportunities that immerse students in education through active research contributions. This session will discuss and explore: 1) educational philosophies of archeological sciences; 2) objectives for an integrated approach to archeological and ecological education; and 3) first-hand learning activities that provide students with an immersive and interdisciplinary approach towards understanding deep-time human-environmental interactions within dynamic riverine ecosystems.

Liz Ettelson and Leah Holloway

Park District of Highland Park, Highland Park, IL

BIO: Liz Ettelson has worked with the Natural Areas Program for the Park District of Highland Park for seven years. Her responsibilities vary from Restoration Technician to Volunteer Coordinator for the program. She assists in managing natural areas in a 680-acre park system. Working with staff and volunteers, the Natural Areas Program completed stream restoration at Millard Park with funding by Great Lakes Restoration Initiative (GLRI).

BIO: Leah Holloway is a Naturalist at Heller Nature Center in Highland Park. She loves all things related to water and the outdoors, and is thrilled to have the opportunity to teach about both for a living. Leah worked with a diverse group of people to help create the Park District of Highland Park's unique Ravine Education Curriculum Guide.

The Ripple Effect: How One Fish Story Inspired a Community

ABSTRACT: It started with a dream to improve native fish spawning habitat in the ravine streams along the Illinois Lake Michigan shoreline. In 2010 the Park District of Highland Park received funding through the Great Lakes Restoration Initiative to restore fish habitat in a ravine stream. Throughout the restoration process staff and volunteers saw the need for educational opportunities in the community regarding ravine habitats. This session is a discussion of the ravine restoration process, the partnerships that made it happen and our hopes for the future of watershed education on the Illinois North Shore.

Rhonda Ferree

University of Illinois Extension, Havana, IL

BIO: Rhonda Ferree is Extension Educator in Horticulture serving Fulton, Mason, Peoria, and Tazewell counties and the Statewide Master Naturalist Coordinator. She has been with University of Illinois Extension for over 25 years where she has held several positions and received many awards. Ferree has a master's and a bachelor's degree in horticulture from the University of Illinois.

Illinois Master Naturalists Help Others Connect with Nature

ABSTRACT: The University of Illinois Extension Master Naturalist program provides science-based educational opportunities that connect people with nature and help them become engaged environmental stewards. The Program educates and trains adult volunteers to help disseminate natural resource information to the public and to assist with conservation and restoration activities in their community. The Master Naturalist program began in Texas in 1997 and was piloted in Illinois in 2004 in Rock Island County. Today the program is in 69 of Illinois' 102 counties and is growing steadily each year. In 2013, 456 Master Naturalist volunteers contributed 33,250 hours "Helping Others Connect with Nature."

This session will highlight the Master Naturalist program in Illinois. You'll learn how this natural resource education and community service program increases environmental literacy and conservation action, thus addressing the growing need to connect people to nature. Special emphasis will be given to Master Naturalist projects working in the areas of river watershed research, education, and stewardship. Learn how to build new and strengthen existing networking opportunities for partnering with Master Naturalist volunteers on watershed programs statewide. If you want to become a Master Naturalist volunteer or find out how your organization can become a program partner, then this session is for you.

Amanda Flegel and Brian Chaille

Illinois State Watery Survey / Illinois Association for Floodplain and Stormwater Management, Champaign, IL

BIO: Amanda is a Hydraulic and Hydrologic Engineer at the Illinois State Water Survey (ISWS) and has been working at the ISWS since 2005. She earned a Bachelors of Science Degree in Civil Engineering with an emphasis in Hydrology and Hydraulic Engineering from the University of Illinois at Urbana-Champaign in 2000. Ms. Flegel is a Professional Engineer in Illinois and a Certified Floodplain Manager. Amanda has worked on several floodplain analysis studies, completing hydrologic and hydraulic analysis and has provided engineering support for producing floodplain mapping for Flood Insurance Rate Maps. She was the Education and Outreach Committee Chair for the Illinois Association for Floodplain and Stormwater Management for the past seven years and is now the Inter-Organizational Chair for IAFSM.

BIO: Brian S. Chaille, PE CFM, is the Senior Technical Reviewer for the Illinois State Water Survey Federal Emergency Management Agency Letter of Map Revision Delegation Program. He is also the Youth Outreach Chair for the Illinois Association for Floodplain and Stormwater Management. Mr. Chaille has more than 28 years of professional experience in water resources analysis, planning, design, permitting and construction in both public and private sectors. His experience includes stormwater and floodplain management, flood control, residential and commercial site development, bridge and highway engineering, drainage litigation, environmental planning, stream restoration and maintenance. Mr. Chaille loves reading to and talking with kids because they love life. His sons can't fathom why anyone would want to take a three-hour test to become a Certified Floodplain Manager, but do understand that building a nursing home behind a levee is not too bright. Mr. Chaille is a graduate of Rose-Hulman Institute of Technology in Terre Haute, IN as well as the University of Illinois at Urbana-Champaign in Hydro-Systems Engineering.

A Hands-on Workshop for Watershed and Floodplain Education and Outreach

ABSTRACT: The Illinois Association for Floodplain and Stormwater Management has two WARD's Stormwater Floodplain Simulation Systems available to borrow to assist with education and outreach about floods and floodplain management. The model is a heavy duty, hands-on simulator for educational outreach that brings home many key concepts in floodplain management to target audiences of all ages. It utilizes interchangeable headwater scenarios and accessories so users see the impact of development in the floodplain as never before. The model will be presented and the speaker will provide insight on how the model might be presented at public work meetings, open houses, school classrooms and other public education opportunities.

Erin Hilligoss-Volkmann

U.S. Army Corps of Engineers, East Alton, IL

BIO: Erin graduated from Arizona State University with a BAE in Elementary Education. She taught middle school science in an urban public school for four years before moving to the Riverbend area. Erin earned her MS in Environmental Sciences from Southern Illinois University Edwardsville and now works as a Park Ranger for the U.S. Army Corps of Engineers at Rivers Project where she focuses mainly on outreach and education. Erin has been with the Corps for five years and finds her work both exciting and rewarding. Erin loves to read, kayak, hike, and watch her son play ball.

Our Mississippi — Bringing River Resources to You

ABSTRACT: In 2012, the Corps of Engineers launched the Our Mississippi curriculum and currently offers educator workshops along the Upper Mississippi River at no cost to local formal and non-formal educators. Participants will take away nuggets of the river's natural and cultural resources through interactive, hands-on activities. Our primary objective is to connect people to this amazing river system and propose a call to action for its long-term sustainability. While the curriculum is specific to the Upper Mississippi River and its watershed, many concepts can translate and be used for other river systems. Participants will shout "Eureka" when they receive a copy of the curriculum at session's end. The Our Mississippi educators' curriculum was developed in partnership with the U.S. Army Corps of Engineers and educators along the Upper Mississippi River System. This product, more than six years in the making, combines concepts in life sciences, social sciences, mathematics and fine arts into a place-based resource to augment both formal and non-formal education settings. The program coordinators will present key components from the 5th-6th grade curriculum, showcase hands-on activities, and discuss opportunities to modify activities for upper and lower grade levels. This will give educators familiar with the Mississippi River and those wishing to learn more a fantastic resource to present a diverse array of subject material with an interdisciplinary, place-based focus. Participants will receive their own copy of the Our Mississippi curriculum.

Erin Johnson

Izaak Walton League of America, Gathersburg, MO

BIO: Erin is the Clean Water Fellow for the Izaak Walton League. She received a Bachelor of Science in Environmental Science from Elizabethtown College. Erin currently leads the League's Creek Freaks program, engaging kids in after-school programming locally, and traveling to provide teacher training workshops nationwide. Prior to joining the League, Erin served as a Watershed Ambassador for the New Jersey Department of Environmental Protection through AmeriCorps. In this position she developed and delivered water-based environmental education to students in grades K-12, organized community events, and performed local stream monitoring. Erin is a self-proclaimed Creek Freak and enjoys sharing this passion with kids and adults!

Creek Freaks: Hands-on Stream Science with Digital Learning

ABSTRACT: Learn how to use Creek Freaks to combine environmental education with digital technology. Creek Freaks engages children ages 10-14 in exploring, monitoring and protecting local streams. Students share photos, stories and data online. Experience Creek Freaks activities hands on, tour the online tools, and pick up the curriculum. The curriculum, called Holding onto the Green Zone, includes activities that teach students about stream ecology, water pollution, monitoring water quality, and presenting information to the public. The field activities are designed to introduce students to scientific careers, including geologist, chemist, biologist, and restoration ecologist. Field activities include biological, chemical, and physical water quality monitoring. This presentation will demonstrate hands-on activities from the curriculum, use of the interactive website, and discussion on how Creek Freaks can be used to engage children in citizen science, stream restoration, and community outreach. Participants will have a first-hand opportunity to conduct some of the activities from the curriculum and to see how the interactive website works. Participants will receive curriculum materials and will learn how to sign up or host future trainings.NEW! Creek Freaks has become an educational partner with OAR Northwest on their Adventure: Mississippi River rowing trip. Students participate virtually, and follow the crew down the length of the Mississippi. Educational outreach from the boat includes stops at schools along the river, lesson modules, webcasts, social media, and blogs. Creek Freaks lessons provide the core foundation for the science on the OAR Northwest trip. Learn how your students can participate!

Ted Kratschmer

National Great Rivers Research and Education Center, East Alton, IL

BIO: Ted Kratschmer is the Field Station Manager and Science Liaison for NGRREC. He has experience in field research, scientific writing and environmental education, and works to make scientific research and concepts understandable for a non-scientist audience. He has a bachelor's degree and master's degree in environmental science from the University of Notre Dame and Webster University, respectively.

Exploring the use of publicly available scientific data in the classroom

ABSTRACT: The session will explore the use of publicly available scientific data sets in the classroom. Utilizing these data sets can help integrate critical thinking, mathematical concepts, biological concepts, and technology into a lesson using real-world data.

Examples of publicly available data will be given, some strategies on finding data accessing, and determining the suitability of those data will be discussed as well. Some examples of potential lessons will be provided. Each participant will be given a lesson plan at the conclusion of the session. The activity will be targeted to high-school level students, and data from the environmental sciences will be the focus.

Sharon Locke

Georgia Bracey

Sue Wiediger

Colin Wilson

Sharon Locke, Georgia Bracey, Sue Wiediger, and Colin Wilson

Southern Illinois University Edwardsville, IL

BIOS: Sharon Locke is Director of the SIUE STEM Center and Associate Professor of Geography and Curriculum & Instruction. Her research areas include geoscience education and strategies for increasing the diversity of the STEM pipeline. Georgia Bracey is Research Associate in the SIUE STEM Center and Project Director for the Inspire STEM teacher professional development program, which focuses on the Mississippi River. She conducts research on STEM learning in formal and informal settings. Susan Wiediger is Associate Professor of Chemistry and supervises chemistry education majors and conducts research on effective teaching in chemistry. Colin Wilson is the SIUE STEM Center Resource Center Manager. He leads teacher professional development programs.

Place-Based Learning about the Mississippi River to Support Teacher Implementation of the Next Generation Science Standards

ABSTRACT: With Illinois' adoption of the Next Generation Science Standards (NGSS), teachers are being asked to re-envision their curriculum to enable students to meet a new set of performance expectations that integrate Disciplinary Core Ideas, Crosscutting Concepts, and Scientific and Engineering Practices. To help teachers meet this challenge, Southern Illinois University Edwardsville, in partnership with the East St. Louis School District and community organizations, developed a teacher institute focused on the Mississippi River and locally relevant science, technology, engineering, and mathematics (STEM) topics. The Mississippi River is an ideal theme for STEM instruction in East St. Louis because it features prominently in the geological, social, economic, and cultural history of the city. By teaching about local places, teachers are better able to make connections between STEM content and students' everyday lives.

Our session will showcase hands-on activities related to rivers that can help middle and high school students meet NGSS Performance Expectations in Earth and Space Sciences and Life Sciences. During the teacher institute, we arranged PE's into bundles, as recommended by Krajcik (2014), and identified a set of activities to support each PE. Teachers had the opportunity to complete the activities individually or in small groups in a self-paced learning environment. This approach provided teachers with additional engagement with the content, and also served as a model for how to provide instruction in a classroom with students of varying abilities.

Nanette Marcum-Dietrich

Millersville University, Millersville, PA

BIO: Nanette Marcum-Dietrich, PhD began her career as a secondary science teacher where her passion for sharing the wonder of science flourished. After a decade of classroom teaching, she completed her PhD in Curriculum and Instruction in Science Education at the University of Delaware. Now an Associate Professor at Millersville University of Pennsylvania, she teaches both Instructional Technology and Science Education courses. Her research interests include the effect of residency models on pre-service teacher training and the use of data-driven technologies in the secondary science classroom. She is the Primary Investigator for a collaborative National Science Foundation (NSF) grant with Dr. Susan Gill (PI) at the Stroud Water Research Center and Carolyn Staudt (PI) at the Concord Consortium called Teaching Environmental Sustainability- Model My Watershed. This grant-funded project developed a national watershed modeling web-based application and curricula that uses GIS data and a professional grade hydrologic model to easily allow the public the ability to model the hydrology in their own neighborhood.

Model My Watershed: Using Local Data to Make Local Decisions

ABSTRACT: Come learn about an exciting free online application that gives anyone (age 8+) the ability to explore and learn about their local watershed. The application uses local data and an online hydrological model to let users make accurate decisions about local watershed issues. The application even lets users implement best management practices in their neighborhood and see the impact of these changes using the online hydrologic model. join the workshop and become passionate about your local watershed!

Heather Mayfield

Foundation for Ohio River Education, Cincinatti, OH

BIO: Heather oversees the development of FORE's educational programs and often serves on the front lines as an educator. Her other responsibility is making sure that all of FORE's programs are adequately promoted and funded. Heather has a degree in Biology from Northern Kentucky University (NKU). Before coming to FORE, she organized a citizen water monitoring program through the Sierra Club Water Sentinels Program, and worked in the Biohazard Assessment Research Laboratory at the U.S. Environmental Protection Agency.

The Ohio River STEM Institute: A University-Community Partnership Bridging STEM Disciplines, Student Monitoring and Environmental Stewardship

ABSTRACT: The Ohio River STEM Institute began as a partnership between the Foundation for Ohio River Education and NKU's Department of Biological Sciences. The goal of the partnership is to bring the STEM disciplines to life through innovative, inquiry-based activities that foster a strong sense of connection and stewardship of the Ohio River. Through this partnership, NKU and FORE have collaborated on a variety of programs that have focused on water quality monitoring, Ohio River Ecology, and current pollution issues, for a diverse collection of audiences including students in grades 4-12, science teachers, watershed volunteers, environmental educators, NKU students, English Language Learners, and communities. In 2013, the Ohio River STEM Institute focused strongly on immersing underserved and minority audiences and delivered five exceptional programs that exposed students to water quality monitoring on the Ohio River as well as careers in source water protection and water quality treatment. Another outcome of the Ohio River STEM Institute was the development of Water Quality, a new mobile application (app) developed by FORE and NKU that enables citizen monitors, teachers and students to easily log and interpret water quality data from rivers, lakes and streams.

Amy McCoy

Living Lands & Waters, East Moline, IL

BIO: Amy McCoy has a BS in Biology Secondary Education and a MS in Environmental Studies. She has taught for ten years as a high school classroom teacher of Biology, Earth Science, and AP Environmental Science. She now works for Living Lands and Waters (LL&W) designing lesson plans and teaching workshops for teachers and students aboard the LL&W floating classroom barge.

Lessons on River Sustainability

ABSTRACT: Living Lands & Waters educators teach lessons about river appreciation and sustainability aboard their floating classroom barge and want to share their unique lesson plans with you. Unlike most outreach educators, LL&W targets an audience of high school students. Learn ways to include high schools in your outreach programs and design lessons that meet the expectations of high school educators.

Catherine McMahon

U.S. Army Corps of Engineers - St. Louis District, St. Louis, MO

BIO: Catherine "Kate" McMahon began her work at the Veterans Curation Program (VCP) in 2009 as a Laboratory Manager in the St. Louis facility. She now serves as an archaeologist for the St. Louis District Corps of Engineers and a project manager for the VCP. Kate completed her undergraduate work at the College of Wooster with a major in Archaeology and minors in Geology, Anthropology, and Sociology; she is currently pursuing a Master's Degree in Archaeology and Heritage Management from the University of Leicester. Kate has participated in numerous archaeological investigations throughout the southwestern United States. These include surveys and excavations in California and Arizona. She received a 2004 National Science Foundation Grant to excavate at the Athienou Archaeological Site in Cyprus.

From Soldiers to Civilians: Educating Veterans for the Future

ABSTRACT: The U.S. Army Corps of Engineers Mandatory Center of Expertise for the Curation and Management of Archaeological Collections created the Veterans Curation Program (VCP) in December 2009. The goal of the VCP is to provide veterans with tangible work skills through the rehabilitation and preservation of archaeological collections and to advance the public stewardship of federally owned archaeological collections. The VCP addresses the need for innovative programs that assist veterans with their transition to the civilian workforce while using archaeological laboratory work as a means of teaching computer skills and history. This session will look at the establishment of this program, its effects on the archaeological and veteran communities, and its future implications for education.

Kim Petzing

Madison County Government, Planning & Development Department, Edwardsville, IL

BIO: Kim Petzing, Madison County Green Schools Coordinator, joined the Madison County Government's Planning and Development Department in January of 2014. Prior to that she served as the Manager of Sustainability Education Programs at the Missouri Botanical Garden's Earthways Center for over 5 years. She has been an environmental educator for nearly 25 years. Throughout her career, Kim has overseen the development, implementation and delivery of multiple sustainability education programs for preK–adults throughout Illinois and the St. Louis region. She develops materials and helps conduct teacher professional development workshops and also serves on the Green Schools Committee of the U.S. Green Building Council's Missouri Gateway Chapter.

Planting the Seeds for Regional Sustainability

ABSTRACT: Discover how the Madison County, IL Government is working with K-12 schools and students to increase regional sustainability literacy (and improve local water quality) through its Green Schools program. Join Green Schools Coordinator,Kim Petzing, as she discusses the program and its components — including water-related topics and lessons. Participants in this informative and interactive session will take part in some of the water-themed activities and will also leave with resources and a blueprint for the program that they can utilize in their own schools or communities.

Libby Reuter

Missouri Coalition for the Environment & Heartlands Conservancy, St. Louis, MO

BIO: Throughout her career as an artist and arts administrator (Washington University and Southwestern Illinois College), Libby Reuter has been a painter, found-object sculptor, and an installation artist. After the flood of 1993, her work has been focused on water. Since 2011, she has been building glass sculptures for Watershed Cairns, a collaboration with photographer Joshua Rowan. Watershed Cairns: Water Marked with Art exhibit is at the Missouri History Museum in Forest Park, St. Louis until February 8, 2015. From February 28 through May 10, 2015, the exhibit will be at Cedarhurst Center for the Arts in Mt.Vernon, Illinois.

ABSTRACT: Since 2011, Watershed Cairns artists Libby Reuter and Joshua Rowan have created more than 70 evocative, large-scale photographic images of found-glass sculptures, or cairns. Their beautiful images visualize the connection between the clean water that we expect and our care of local streams. To accomplish this public watershed education goal, the cairns are temporarily placed on sites in metropolitan St. Louis where the watershed is working to collect, clean, and conduct fresh water… or not. The cairns are removed after being photographed and the images are displayed on the Web at www.watershedcairns.com and exhibited in public venues.

The Watershed Cairns: Water Marked with Art exhibitions at the Missouri History Museum in St. Louis, Missouri, through January 2015 and at the Cedarhurst Center for the Arts in Mt. Vernon, Illinois, February – May 2015 encourage visitors to perceive water in their own neighborhoods. An interactive map in the exhibits and on the project's Web site widens the viewer's focus to the network of streams and sewers that connect us to the Mississippi River, the ocean, and each other. Programs created in collaboration with regional, state, and federal organizations, schools and nonprofit environmental groups, and other visual and literary artist inspire citizens to nurture our fresh water resources.

Gillian Roerhig and Justin McFadden

University of Minnesota-STEM Education Center, St. Paul, MN

BIO: My research and teaching interests are centered on understanding how teachers translate national and state standards into teaching events and curriculum in their classrooms. Teachers' knowledge and beliefs about teaching and learning directly influence the specific teaching practices implemented by teachers. Of particular interest is how teachers, from pre-service through induction and into the inservice years, represent "science as inquiry" in their teaching and how different induction and professional development programs can influence teachers' knowledge, beliefs, and classroom practices. My early research focused on the constraints experienced by beginning teachers as they implement inquiry-based instruction in their classrooms and how these constraints can be mitigated through participation in a science-focused induction program. Key areas of interest have been the teaching beliefs and views of the nature of science held by the beginning teachers, and the role of curriculum in supporting beginning teachers.

BIO: Justin McFadden is a graduate research assistant at the STEM Education Center at the University of Minnesota. He has taught science methods and technology courses for pre-service teachers building upon his experiences teaching high school science the previous 5 years. Upon completing his MA in Science Education, he has begun working towards his doctorate in STEM Education and is on track to graduate in the spring of 2015. He has supervised teacher candidates and works with in-service science teachers through the university's induction program. His research interests include informal teacher professional development, STEM integrated curriculum development, and technology integration in K-12 schools.

Gillian Roerhig and Justin McFadden (continued)

The River Run: Professional Development with a Splash of Technology

ABSTRACT: This presentation will highlight the professional development efforts of the River Run (http://stem-projects.umn.edu/riverrun/). The River Run is designed to help K12 teachers develop a curriculum designed at teaching students about the impacts humans have on the Minnesota River Valley Basin.

The research team is headed by Dr. Gillian Roehrig and assisted by Devarati Bhattacharya, Engin Karahan, Justin McFadden, and Senenge Andzenge. This presentation will discuss the team's research agendas and preliminary results, teacher professional development experiences, and curriculum development efforts. The presentation will discuss technology integration (as it can apply to an environmental science class) and highlight student-created projects that highlight the socio-scientific issues of the watershed. The presentation will also discuss the relationships that have been created during the project, which include: non-profits, private businesses, citizen-led organizations, and research scientists. The professional development is aimed at creating meaningful relationships with teachers in the watershed and the creation and development of a meaningful, context-dependent learning experience that creates an authentic and engaging learning experience for students located within the watershed.

Jennifer Tariq

Douglas-Hart Nature Center & Project WILD

BIO: Jennifer Day Tariq is the Project Wild Coordinator for Illinois and the Education Director for the Douglas-Hart Nature Center in Mattoon, IL. Hailing from rural Effingham County, Jennifer grew up splashing in the creek beds, chasing butterflies, and even trying to build a fort in a locust tree. Her adventures led to a desire to teach, but not in a classroom — the outdoors is her classroom. With 10+ years experience in Environmental Education, Jennifer's mission is to provide the experiences children need to accompany the learning and information they are given. Jennifer is a Certified Interpretive Guide and facilitator for Project Learning Tree and Growing Up Wild in addition to coordinating the revival of Project WILD and Aquatic WILD in Illinois. Jennifer and her family, including her six year old son, spend a lot of time back at her old family homestead, encouraging her next young naturalist!

Aquatic WILD… Splash Into Me

ABSTRACT: Water in all its forms is one of the most dramatic of today's arenas in which informed, responsible, and constructive actions are needed. Aquatic WILD uses the simple, successful format of Project WILD activities and professional training workshops but with an emphasis on aquatic wildlife and aquatic ecology. Every participant will receive the newly revised 2013 edition of Aquatic Wild. This 396-page K-12 Curriculum and activity guide is full of hands-on activities and investigations.

Matthew Young and Allison Rhanor

National Great Rivers Research and Education Center, East Alton, IL

BIO: Matthew Young is the RiverWatch Biologist for the National Great Rivers Research and Education Center. RiverWatch is a statewide citizen science program for adults that focuses on monitoring the water quality of wadeable streams. Matthew received a BS in Fisheries and Wildlife Biology from Arkansas Tech University in 2010, and an MS in Zoology from Southern Illinois University Carbondale in 2012. Matthew has since worked as a Fisheries Technician for the Illinois Natural History Survey, and came on board as the RiverWatch Biologist in August 2013.

BIO: Allison Rhanor is the Environmental Educator for the National Great Rivers Research and Education Center. Allison received a BS in Zoology from Southern Illinois University Carbondale in 2012, and continued working for the university as a research assistant following graduation. With a background in stream ecology and a passion for bridging scientific and public communities, she joined the education team at NGRREC in May 2014 where she has since assisted in the development and implementation of education and outreach programs for potential watershed stewards of all ages.

Matthew Young and Allison Rhanor (continued)

Stream Discovery: A Water Quality Monitoring Program for Schools

ABSTRACT: The Stream Discovery program is an environmental education project that provides students in grades 5-12 with the unique hands-on opportunity to learn about water quality in their community by monitoring a local stream. Students, schools and youth groups can all develop a deeper connection with their natural environment by monitoring and protecting a special stream. Stream monitoring and related service activities such as stream clean up and plantings inspire a lifelong stewardship of our environment. Monitoring involves a habitat, chemical, and biological survey of a local wadeable stream. The first part of the workshops involves a program overview and identification of aquatic macroinvertebrates. The second part of the workshop involves field training at a local stream. Stream Discovery uses the Field Scope Database by National Geographic to store and analyze stream quality data. FieldScope is also being demonstrated at this symposium during an additional session.

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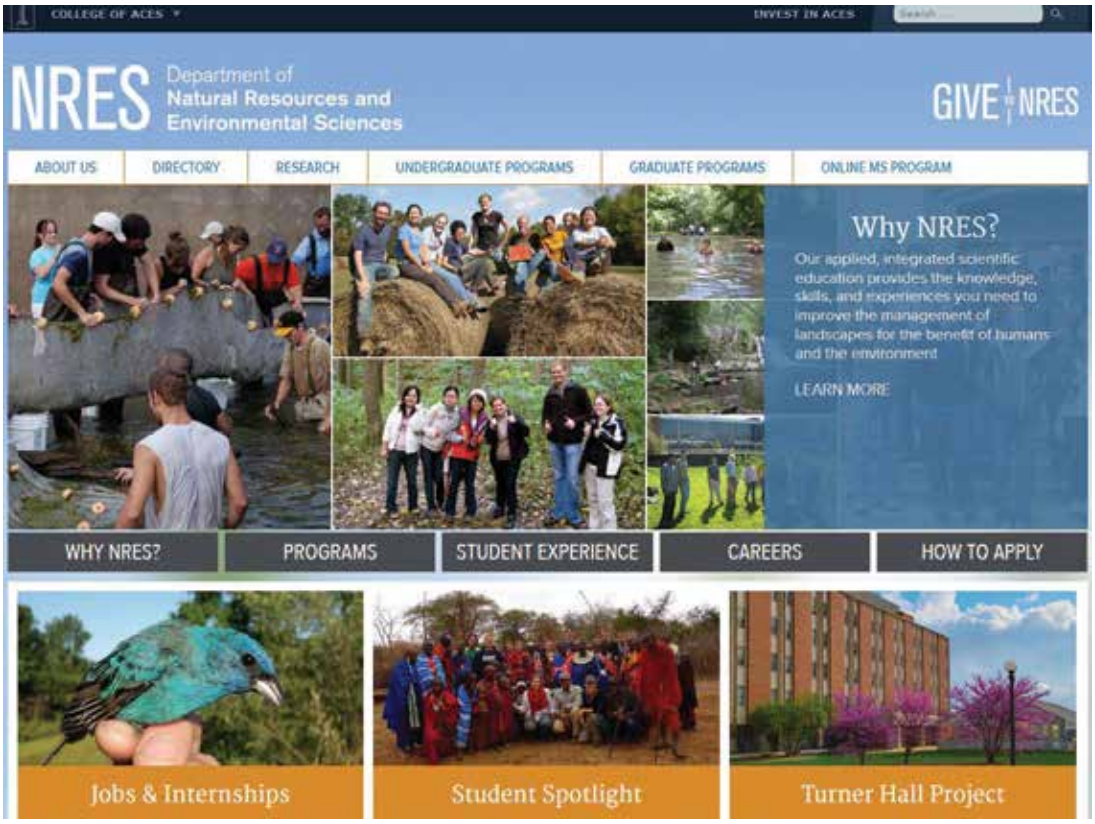

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