Project: Northwest Arkansas Low Impact Development (NWA LID) Conference

SGA 20-700

Final Report

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Executive Summary

The Illinois River Watershed is characterized by rapidly growing urban centers, ranging from the headwaters just south of Fayetteville to Bentonville, with many smaller outlying towns exhibiting growth rates that outpace that of the big four cities (Fayetteville, Springdale, Rogers, and Bentonville). As the region develops westward into the now rural areas along the Oklahoma border, we anticipated the need to address NPS pollutants. The installation of best practices for managing NPS pollution driven by precipitation runoff, specifically low impact development (LID) and green or natural infrastructure (GI), have proven to be a cost-effective way to address phosphorus loading, as well as address other NPS pollutant impairments such as pathogens, sulfate, and nitrate that are currently present in the watershed (ADEQ, 2016).

The Northwest Arkansas Low Impact Development (NWA LID) Conference was held on November 3rd and 4th 2021 at Thaden Fieldhouse in Bentonville, Arkansas and educated an average of 91 adult learners over the two days. The conference was delivered in a hybrid format, hosting both in-person attendees and virtual ones via Zoom. IRWP invited 12 guest speakers with strong professional backgrounds in various aspects of stormwater management, design, planning, and financing to deliver 45-minute presentations followed by questions and answers. A field tour portion was hosted at Osage Park wetland preserve in "praise of our floodplains, wetlands, prairies" to demonstrate creative ways to increase utilization of and positive public perception for LID, GI, and use of stormwater-infiltration, management and native species in community and public spaces.

The Problems: Urbanization and Increasing Rates of Precipitation

The Illinois River Watershed (IRW) has experienced rapid urban growth over the last two decades, with an estimated 32 people moving into the metropolitan statistical area per day (NWA Council, online). The population of the region increase by nearly 25% between 2010 and 2020, the fastest in the State of Arkansas (AEDI, 2020). The increased presence of impervious surface areas associated with urbanization, such as road construction, commercial development, and residential expansion, has exacerbated NPS pollutant loading and stream instability. Impervious surfaces has also altered the infiltration capacity of soils and quantity and quality of runoff into stream channels. In addition to direct NPS pollutant loading from immediately adjacent lands, additional water velocity and quantity can lead to unstable and eroding streambanks in downstream portions of the watershed. Within the IRW, 74% of soils are considered moderately to extremely erodible, which can result in high quantities of new sediment and nutrient loading (FTN and Associates, 2012). An additional factor to consider is that rainfall variability and frequency of extreme precipitation events are predicted to increase for the Ozark-Ouachita Interior Highlands over the next decade, resulting in even greater extremes of both wet and dry conditions (Diffenbaugh et al. 2005). Therefore, increased focus on stormwater runoff and flooding mitigation education is paramount to improving water quality in Northwest Arkansas as its urban centers continue to grow and expand.

Water Quality Goals and Objectives

The conference was intended to provide educational opportunities and demonstrate methods for implementing LID and GI best management practices. It provided a national perspective on water quality challenges resulting from urban growth and solutions that could encourage sustainable management with a goal of overall water quality benefits. This national perspective was placed in the context of a rapidly urbanizing Northwest Arkansas to encourage proactive water resource management and protection. In doing so, the conference promoted awareness of the watershed and current non-point source water quality challenges and identified a range of solutions from active measures, such as site planning for green infrastructure practices, to passive measures such as conservation of undeveloped floodplains, wetlands, and riparian forests and flood mitigation.

Original Project Timeframe

The pandemic necessitated adjustment to the original schedule and delayed the conference from November of 2020 until November of 2021. A request for extension from ANRC was verbally granted to extend the grant until the December 31, 2021 to conduct the conference.

Cooperators Involved and their Roles

IRWP as the primary conference organizer worked with partner organizations and companies from around the region and the United States to hold the conference. More than a dozen private companies, trade associations, watershed management organizations, and consultants presented during the conference with many other organizations assisting in co-facilitating and organizing the conference. We also partnered with the American Society of Landscape Architects, Arkansas State Board of Licensure for Professional Engineers, and others in pursuing Continuing Education Unites (CEU).

Funding Breakdown (Federal and State)

The 319(h) grant funded a total of $30,000 (36%) of the costs which was matched with Walton Family Funding of $54,270 (64%).

Measures of Success

The NWA LID Conference implemented under this grant provided educational opportunities for development professionals from city and municipal governments, engineering, and landscape architecture to learn new or updated practices and measures to proactively address water quality through LID and GI via stormwater management. IRWP engaged qualified professionals to fill speaker slots throughout the conference. 93% of participants said the conference increased their awareness of water quality impacts from stormwater. Our aim was to improve educational access for those target audiences with the goals of identifying cost-effective methods for water quality improvement on both large and small scales and for attendees from defined target audiences to change some facet of their professional work to assist in mitigating surface runoff from precipitation flows. Survey results indicate that 90% of conference

attendees “Agree” or “Strongly Agree” that there is at least one new idea that they can implement in their professional work in the next year to help the region proactively address stormwater management.

Conference Curriculum

With the overall message of “In 10 years, what will we wish we had done to protect the Illinois River?” we focused the LID Conference curriculum on driving awareness of current non-point source water quality challenges in the watershed. The conference provided an overview of water quality challenges in the Illinois River watershed and introduced a range of solutions from active measures, such as site planning and financing green infrastructure practices, to passive measures such as conservation of undeveloped floodplains, wetlands, and riparian forests and flood mitigation. A project steering committee with representatives from Crafton-Tull, Burns-McDonnell, Baldwin-Shell Construction, and Northwest Arkansas Master Naturalists provided guidance on creation of effective curriculum tailored to a professional demographic and assisted in the search of ideal local, regional, and national guest speakers and appropriate vendors.

The technical themes that guided the conference curriculum development included:

I. Comprehensive review of the water quality status and sources of water quality impact in the Illinois River Watershed.
II. Solutions for low impact precipitation management for new developments, retrofits, and areas with aging infrastructure.
III. Methods of passive stormwater management through conservation of floodplains, existing green space, and wetlands.
IV. How to fund and appropriately design and construct ecological restoration projects.
V. The role of LID and GI in mitigating flood hazard resulting from urban expansion and extreme weather events.

The NWA LID Conference curriculum featured national, regional, and local experts in LID and GI to advance the concepts behind leveraging ecosystem services to mitigate NPS pollution. Conference materials were provided in an easy-to-access online Resource Hub and conference presentations were recorded and made available to participants and the broader public after the conference. Stormwater-focused educational materials on each of the five technical topics were made available and accessed via QR codes and weblinks during the conference. Some educational materials provided included The Illinois River Watershed Toolkit, Community Design Center’s LID Manual, brochures/books from presenting and partner organizations, speaker presentations, and local city and national stormwater resources referenced throughout the event were made available for download. The resulting curriculum is accessible to conference attendees and the public through the NWA LID Conference Hub (www.irwp.org/nwalid2021/). A full agenda and speaker bios are available via weblink or see Appendix 1.

Our aim was to improve educational access for those target audiences with the goals of identifying cost-effective methods for water quality improvement on both large and small scales and for attendees from defined target audiences to change some facet of their professional work to assist in mitigating surface runoff from precipitation flows. Survey results indicate that 90% of conference attendees "Agree" or "Strongly Agree" that there is at least one new idea that they can implement in their professional work in the next year to help the region proactively address stormwater management (see Professional Development Survey Remarks in Appendix 2.)

Project Chronology

The pandemic led us to adjust the original timeline for the project and delay the conference from November of 2020 until November of 2021. The schedule of tasks and subtasks along with the actual chronology is outlined in Table 1. In addition, a timeline of promotional activities is included as Appendix 3.

Table 1: Schedule of Tasks and Outputs

Task	Subtask Number	Description	Start Date	Completion Date	Date Completed
1	1.1	2021 Financial Review	Jan. 1, 2021	March 31, 2022	October 1, 2021
2	2.1	Assemble educational content	Oct 1, 2020	Oct 31, 2020	January 1, 2021
	2.2	Disseminate meeting promotional materials	Oct 1, 2020	Oct 31, 2020	January 1, 2021
	2.3	Prepare pre- and post-event surveys	Nov 1, 2020	Nov 30, 2020	Nov 1, 2021
	2.4	Host the conference	Nov 1, 2020	Nov 30, 2020	Nov 3-4, 2021
3	3.1	Quarterly Reports	Oct 1, 2020	Oct 15, 2021	Oct 2020 – Dec 2021
	3.2	Annual Report	Oct 1, 2021	Oct 15, 2021	October 15, 2021
	3.3	Attend and participate in annual project review meetings if requested	June 1, 2021	Dec 31, 2021	None requested
	3.4	Draft Final Report	Oct 16, 2021	Dec 31, 2021	Extension to January 15, 2022. Submitted January 12.
	3.5	Submit Final Report	Jan 1, 2022	Mar 31, 2022	

All deliverables completed under this grant are included in Appendix 4.

Challenges and Lessons We Learned

We had to be flexible and creative due to the pandemic which led us to delay the conference by one year, originally scheduled in 2020, to hold it in December 2021. In consultation with ANRC and Walton Family Foundation, we ultimately decided to deliver the conference both in-person and virtually via Zoom. Managing in-person vs. virtual registration for both attendees and speakers proved challenging. For future hybrid-delivery events, it is recommended to charge a small fee that would incentivize registrants to want to participate in-person where the peer-to-peer education opportunities are better. We had many registrants switch to virtual participation close to the conference date and many who registered but did not contribute and/or participate at all, lowering our overall attendance below the target of 150 participants. For future events, communications will be tailored to emphasize the importance of in-person contribution and imply less flexibility on switching so that conference logistics may be finalized, and therefore communicated, earlier.

Only 29 participant surveys were collected (29 out of 91 average attendees = 32% survey completion rate) although we had a target of 90% survey responses. This lower than desired completion rate was likely due to the survey being given electronically. We did follow-up with participants multiple times to complete the surveys to achieve this rate of completion. Future surveys should be completed exclusively in-person and in hard-copy to ensure higher participation rates.

Retrospectively, we also believe the conference should have put more emphasis on direct outreach to participants. Survey results indicated that 83% of attendees that participated did so because of direct outreach by staff, board members, and others. While our advertising and outreach efforts targeted the specified demographics specified by the grant, we learned that really the most effective method for outreach are personal invitations from peers. To get professionals who are new to LID, we will need to expand relationships with non-traditional participants in, for example the construction industry, and do more outreach. Along that same line, in the future we will create breakout groups with more technical education and discussion in order to tailor content to individual areas of professional work.

Outcomes and Survey Summary

Outcomes

The conference's most notable success was in the advancement of a shared vision among diverse stakeholders on the need for and approaches to incorporating Low Impact Development best management practices into policy and planning. The conference provided an opportunity to learn from each other how environmental, government, non-profit, and business groups can individually and collectively work to manage stormwater, expand partnerships, and integrate best management practices into short and long-term planning. Both

sentiment and survey results among participants indicate that the conference successfully provided educational opportunities on stormwater impacts and provided tools for its responsible management.

We are proud of the innovation utilized for distributing paperless conference materials, limiting the amount of waste from printed agendas, surveys, and educational resources. Our online resources can be referenced by attendees and the community alike, which includes the recorded sessions, furthering the impact. The process created for verifying virtual attendance was praised by ASLA and they will be adopting this paperless process for their future seminars, just as we now use this approach at our organization when doing educational events.

115 people registered for in-person or virtual attendance and the maximum number of participants was 99 on Day 1. Some reasons for lower than anticipated attendance were likely due to COVID-19 fears, competing priorities due to a booming real estate market, traditional views that LID is a low priority and optional in development, among other reasons. Attendance over the course of the two days is summarized in Table 1. Registrant audiences included: Engineers: 38; Landscape Architects: 7; City/Municipal: 21; and Agency and Business Partners: 43.

Table 1: Summary of Conference Attendance

	In-Person	Virtual	Total
Day 1	59	40	99
Day 2	52	31	83
Average	55.5	35.5	91

Survey Results

A post event survey was conducted to gauge the overall effectiveness of the conference in meeting the education and awareness goals. Respondents used a scale of -2 (Strongly Disagree) to 2 (Strongly Agree), with 0 being neutral. Results are summarized as averages in Table 2.

Table 2: Summary of Responses to Post-Event Survey

Question	Average Response
I was satisfied with event communications and logistics	1.59
I was satisfied with the presentations and topics covered at the conference	1.69
The conference increased my awareness of water quality impacts from stormwater	1.55
There was enough time for discussion	1.52
If another LID conference was held I would plan to attend	1.69

The information presented was technical enough while providing broader ideas and perspectives	1.48
I feel positive about the future of stormwater management in the NWA region	0.86
I have at least one new idea that I can implement in my professional work in the next year to help the region proactively address stormwater management	1.34

We found that 44% of conference attendees (20 of 45) from the target audiences (architects, engineers, and landscape architects) received continuing education unit hours from the conference. This included: 14 Professional Engineers (PE) received credits and 6 Landscape Architects received Health, Safety and Welfare (HSW) credits through the Landscape Architecture Continuing Education System (LA CES).

More than 90% of conference attendees reported that they “Agree” or “Strongly Agree” that the conference increased their awareness of water quality impacts from stormwater. Responses were scored on a scale of -2 (Strongly Disagree) to 2 (Strongly Agree). The average response for this question was 1.55.

90% of conference attendees reported that they “Agree” or “Strongly Agree” that there is one new idea that they can implement in their professional work in the next year to help the region proactively address stormwater management. Responses were scored on a scale of -2 (Strongly Disagree) to 2 (Strongly Agree). The average response for this question across the responses was 1.34. In addition, we required those receiving CEUs as Professional Engineers to provide a comment for each presentation regarding how they can utilize a component of the information proactively in their work. These responses are recorded in the Professional Development Records.

Measures of success and performance, as per the grant agreement, are summarized in Table 3.

Table 3: Measures of Success and Performance Results

Pre-Conference Measures	Results
All guest speaker slots are filled with qualified professionals.	Secured 12 Guest Speakers
150 individuals registered to attend prior to Conference day.	Secured 115 Registrants
Development of focused curriculum for professionals on five topics:	Completed
Comprehensive review of the water quality status and sources of water quality impact in the Illinois River Watershed.	Addressed with "Status of the Illinois River Watershed" and "Conservation and Restoration in the Illinois River Watershed" presentations at the summit in addition to the Illinois River Watershed Toolkit
Solutions for low impact stormwater management for new developments, retrofits, and areas with aging	Addressed with multiple presentations

infrastructure.	
Methods of passive stormwater management through conservation of floodplains, existing green space, and wetlands.	Addressed with multiple presentations
How to fund and appropriately design and construct ecological restoration projects.	Addressed with multiple presentations
Post-Conference Measures	**Results**
Over 90% completion of conference surveys.	Only 29 surveys were collected (29 out of 91 average attendees = 32% survey completion rate). This lower than anticipated completion rate was likely due to the survey being given electronically. We followed-up with participants multiple times to complete the surveys. Future surveys should be completed exclusively in-person and in hard-copy to ensure higher participation rates.
Fifty percent of conference attendees from defined target audiences will have changed some aspect of their professional work to proactively address stormwater management.	90% of conference attendees reported that they “Agree” or “Strongly Agree” that there is one new idea that they can implement in their professional work in the next year to help the region proactively address stormwater management

Technical Transfer and Feedback

The LID conference was highly valued by those who participated. This conference should be repeated every few years to support future education and awareness on LID and GI. Future conferences should be structured to divide the attendees into professional working groups tailored to their area of practice or interest to allow for more or less technical learning and discussion based on interests. Working group leaders and technical experts can facilitate breakout groups and lead discussions to give attendees another chance to connect with like-minded LID leaders in their field of work.

Engaging with Continuing Education Unit partners is critical and we recommend giving each education module a unique code once learning objectives have been assigned. Presenters often adjust module titles at the last moment and this can be quite confusing when dealing with organizations certifying professional development hours.

Finally, the use of paperless technology for delivering resources throughout and after the conference was well received, reduced environmental impact, and saved staff labor. We encourage continued use of web pages or applications for information sharing when possible.

References

Arkansas Economic Development Institute (AEDI). Percent Change in Total Population Arkansas by County: 2010 – 2020. Can be accessed at https://arstatedatacenter.youraedi.com/census-2020/

Arkansas Department of Environmental Quality (2016). Integrated Water Quality Monitoring Assessment Report. Can be retrieved online at https://www.adeq.state.ar.us/water/planning/integrated/303d/list.aspx

Diffenbaugh, N. S., J. S. Pal, R. J. Trapp, and F. Giorgi. 2005. Fine-scale processes regulate the response of extreme events to global climate change. Proceedings of the National Academy of Sciences of the United States of America **102**:15774-15778.

FTN Associates, Ltd. (2012) Watershed-Based Management Plan for the Upper Illinois River Watershed, Northwest Arkansas. Can be retrieved online at http://irwp.org/water-quality-monitoring/watershed-based-plan/

Northwest Arkansas Council. Online. Northwest Arkansas by the Numbers. Can be accessed online at: http://www.nwacouncil.org/northwest-arkansas

Appendices

Appendix 1: Final Agenda and Bios

Appendix 2: Professional Development Remarks from Survey

Appendix 3: 2021 LID Event Plan Promotion Timeline

Appendix 4: Grant Deliverables