

NV5's Shortened Abstract on Bregy Elementary School

Partnership in Practice: How Collaboration Shaped the Bregy Schoolyard Improvement Project

R. Feldstein^{1,*}, R. Mannion¹ & M. Connor¹

¹NV5, Walnut Street, Philadelphia, Pennsylvania, 19107, USA

*R. Feldstein email: rachel.feldstein@nv5.com

What we will be presenting:

Located in South Philadelphia and serving 365 K–8 students, the F. Amedee Bregy Schoolyard was reimagined through Trust for Public Land's *Parks for People* program. A 14-week Participatory Design process placed students at the center of concept development, fostering environmental awareness and empowering them to shape a schoolyard that supports play, learning, and green infrastructure education.

Partnership with the Philadelphia Water Department further advanced the project through the Stormwater Management Incentives Program Grant. The resulting system—a planted rain garden supported by a subsurface infiltration trench—captures runoff from the schoolyard, parking lot, and adjacent streets, managing approximately 1.5 acres of drainage.

The multi-disciplinary presenters (R. Mannion-*landscape architect* and Feldstein-*engineer*) will highlight the community-driven planning and municipal collaboration that helped to transform an underutilized asphalt yard into a resilient, educational, and community-centered public space.

What the audience will learn:

The Bregy Schoolyard Improvement Project demonstrates how factors beyond technical design can significantly elevate the impact of a green infrastructure retrofit. This case study highlights how:

- **Deep community engagement** builds ownership, strengthens programmatic goals, and leads to multifunctional spaces that reflect real user needs.
- **Cross-agency partnerships** expand resources, align priorities, and enable more proactive and integrated stormwater planning.
- **Iterative, multi-stakeholder collaboration** improves project adaptability, ensuring the final design meets environmental, educational, and community objectives.
- **Collaborative, multi-disciplined design** can lead to a more well-rounded project.



Bridging Science and Practice: Disseminating Urban Stormwater Innovations

R. E. Kaintz^{1,2,*}, A. J. Erickson², J. S. Gulliver^{2,3}

¹Department of Civil and Environmental Engineering, Pennsylvania State University, 201 Old Main, University Park, PA 16802, United States

²St. Anthony Falls Laboratory, College of Science & Engineering, University of Minnesota, 2 SE 3rd Ave, Minneapolis, MN 55414, United States

³Department of Civil, Environmental, and Geo- Engineering, College of Science & Engineering, University of Minnesota, 500 Pillsbury Dr SE, Minneapolis, MN 55455, United States

*Corresponding author email: rek5453@psu.edu

Highlights

- Practitioner interviews identified regulation, risk tolerance, and guidance as innovation adoption barriers.
- Practitioners preferred concise summaries, cost and maintenance information, case studies, and tools.
- Effective technology transfer requires engagement and integrated dissemination planning.

Introduction

Rapid urbanization and increasing climate variability have intensified stormwater management challenges, including flooding, erosion, and water quality degradation, due to increased runoff from impervious surfaces. Similar to the Villanova University Center for Resilient Water Systems, the St. Anthony Falls Laboratory (SAFL) at the University of Minnesota conducts extensive research on stormwater treatment technologies in five main areas: aging stormwater ponds, filtration media amendments, resilience to extreme events, infiltration, and chloride reduction.

However, the impact of this research depends on effective communication and technology transfer to practitioners, policymakers, and community stakeholders. This project aimed to evaluate and improve the dissemination of SAFL stormwater research through literature review, stakeholder interviews, and the development of practitioner- and community-focused outreach materials designed to make technical findings more accessible, actionable, and relevant for implementation.

Methodology

Research Synthesis and Data Collection

A mixed-methods approach was used to support the dissemination and technology transfer of stormwater research conducted at SAFL. Two stormwater research themes—ponds and resilience to extreme events—were selected for synthesis because they represent key focus areas in stormwater research: water quality improvement and adaptive stormwater management. Semi-structured interviews were conducted with SAFL researchers involved in both topic areas to gather information on research objectives, project roles, implementation challenges, knowledge transfer needs, and future research priorities. In parallel, relevant technical resources, including publications, presentations, reports, and seminars, were reviewed to extract key findings, practical applications, and research gaps. Interview notes and literature findings were synthesized using a thematic spreadsheet organized around stormwater design, performance, stakeholder engagement, implementation barriers, and technology transfer pathways.

Outreach Development and Practitioner Engagement

To identify preferred outreach formats, communication strategies, and information needs, additional semi-structured interviews were conducted with water resources practitioners and government employees in the Minneapolis region.



Insights from researcher and practitioner interviews, along with technical literature, informed the development of outreach materials tailored to professional audiences. Draft products included webpage content, fact sheets, trade journal articles, and summary articles designed to communicate stormwater research in a clear, accessible format. All outreach materials were iteratively reviewed by SAFL researchers to ensure technical accuracy, clarity, and relevance before finalization.

Key Findings

Practitioners and researchers consistently emphasized that effective stormwater technology transfer depends on clear, concise, and application-oriented communication. Preferred formats include short summaries, fact sheets, visual materials, and centralized online resources that emphasize implementation guidance, maintenance needs, cost considerations, and outcomes. Regular engagement through workshops, symposiums, webinars, and in-person discussions was also identified as important for building trust and supporting the uptake of research into practice.

Research synthesis across stormwater ponds and extreme event resilience highlighted several key system behaviors and performance drivers. For stormwater ponds, findings show that internal processes such as thermal stratification, oxygen depletion, sediment accumulation, and vegetation dynamics can significantly reduce phosphorus retention and overall treatment effectiveness, with performance strongly dependent on site-specific conditions. For extreme rainfall events, modeling results indicate that storage-based strategies, particularly enhanced detention (e.g., wet ponds with increased storage) and Smart Pond approaches, are more effective for flood mitigation than infiltration-based practices (rain gardens) or pipe upsizing alone under high-intensity storm conditions.

Across both focus areas, a major outcome of the project was the translation of technical research into practitioner-oriented outreach materials that support real-world decision-making. Research findings were synthesized into accessible products, including web summaries, fact sheets, and trade-style articles, designed to help engineers, watershed managers, and policymakers interpret results and apply them to planning and maintenance contexts. This work strengthens the connection between stormwater research and implementation by making complex findings more usable across professional audiences.

Recommendations

Effective stormwater research translation depends on clear, practical communication and sustained engagement with practitioners. Future work should expand practitioner input beyond small samples to better represent the range of agencies involved in stormwater management, and continue strengthening collaboration through workshops, roundtables, and other direct exchange formats. Outreach materials should consistently include applied information such as costs, maintenance needs, and implementation pathways to support real-world adoption. For stormwater ponds, continued work is needed to better understand aging systems, improve monitoring, and evaluate treatment strategies like dredging, aeration, and chemical amendments under different site conditions. For stormwater resilience to extreme events, future research should focus on improving climate-informed design assumptions and evaluating storage-based and hybrid strategies across varied watershed contexts while accounting for cost and regulatory constraints.

Key lessons learned:

- Clear, applied communication is essential for translating research into practice.
- Storage-based stormwater strategies are effective but highly context-dependent.
- Long-term resilience requires adaptive planning and better integration of monitoring and decision tools.