Water Resources Collaborative Meeting
Meeting Focus: Green Infrastructure—Lessons Learned for NC

Triangle J Council of
Governments

Thursday, March 5, 2020
2:00 pm – 4:00 pm
Triangle J Council of Governments
4307 Emperor Blvd, Durham NC 27703

Meeting Minutes

Lessons Learned from Funding Green Infrastructure Projects in NC
Heather Jennings, Albemarle-Pamlico National Estuary Partnership Program Manager

- APNEP works from the headwaters to the sounds to educate and inform, promote partnering and leveraging resources, sponsoring funding or helping write grants, and working with local governments on coastal green infrastructure (GI) projects.
- Previously, Heather managed the 319 Nonpoint Source Grant Program at NCDEQ for 13 years.

Presentation lessons learned:
- Always include (overestimate) O&M costs!
- Map projects and drainage area to communicate the benefits to the public better.
- Always include green infrastructure and watershed protection in your watershed management plans! You're only qualified for [319 grant] funding when you include it in your plan.
- Get community buy-in through selling the aesthetics of GI projects.
- Research level monitoring may not be necessary or cost-effective.

Discussion:
- Deanna Rosario, Spring Lake: Have you studied the financial burden of flooding?
- Heather: Yes; we are exploring this focusing on coastal GI and sea level rise. For instance, when you compare bulkheads and living shorelines after hurricanes, the living shorelines are both more resilient and more cost effective.
- Deanna: Spring Lake is trying to figure out how to help the community mitigate future damages; what funding sources exist for this?
- Heather: Emergency management has FIMAN stations across coast, which are used to predict flooding impacts and storm surge; she can share information. Each station costs approximately $16,000-17,000. O&M costs are low and can be done remotely unless there's a big storm.

- Christy: Is there grant funding to include O&M in budgets?
- Heather: 319 grants can only provide O&M funding during a 3-year window. Would it be possible to come up with school O&M agreements?
- Heather: Agricultural BMPs funded through NC Division of Soil and Water Conservation require 5-10 year maintenance agreements. So far it hasn't been possible to get funding from NCDEQ to do the same, but they recognize the need.
- Anyone is welcome to ask Heather for her list of funding sources; there are more available than you may know of!

Green Infrastructure Lessons Learned at UNC-CH
Sally Hoyt, UNC Stormwater Utility Manager

- Think of UNC as a town of 40,000 with >50% impervious area in the central part.
- At the Battle Grove restoration site, they implemented a Regenerative Stormwater Conveyance (RSC) which is a hybrid between a stream restoration and an engineered stormwater control measure (SCM.) It has a series of step-pools with a mixture of sand and wood chips underneath.
  - Other SCMs she has implemented on UNC's campus include bioretention, permeable pavement and rainwater harvesting; she has worked with NCDEQ on minimum design guidance for these projects.
- The RSC project was identified through UNC's stormwater master plan in 2004 and built in 2016—note the long-term planning needed to implement this project!

10 lessons learned:
1) Be sure to have buy-in from staff (including grounds department) and have someone on your maintenance team trained in specialty landscaping.
2) Be sure to account for groundwater in your designs—it can surprise you. Carefully plan sites before committing to a project; consider how infiltration in your project will affect building foundations, etc.
3) Plan for multiple benefits to show success! Nutrient results were inconclusive, but the RSC showed TSS reduction, buffer, habitat connectivity including for pollinators, and was an excellent education site.
4) Leverage grants! A 319 grant matched with stormwater utility fees funded this project. The grant made it possible to "sell" to the university the plan to implement an innovative project, even while there were other urgent stormwater priorities.
5) Choose a visible location for public education.
6) Pre-qualify contractors with experience doing stream restoration and SCM construction if possible.
7) Know that it's easier to get a project approved if you're solving an existing problem. With the RSC, the area was always wet and hard to mow; now isn't!
8) Plan for cost and time of maintenance, especially if existing staff don't have experience with the specific type of maintenance. They estimate >200 hrs/year for maintenance of this RSC, including student volunteers to do weeding.

9) Communication will be an issue, and you will have to figure out how to deal with mistakes.
10) Research-level monitoring isn't necessary for every project, given site or funding constraints.
11) Getting out ahead of regulations may or may not help you; the regulations may change!

Discussion
- Bill Holman: How did you get a horticulture crew established to maintain the project? This seems rare.
- Sally: The crew originally was formed for another purpose—the UNC Memorial Gardens weren't being maintained. Its establishment was funded by previous university donors, and then the crew was used to maintain the RSC landscaping as well.
- Lori: What was the total project cost?
- Sally: $350,000. This was partly because it is expensive to work on campus; for instance, they had to rent parking spaces to house materials and use fancier stone per UNC regulations.
- Peter Raabe: Can you comment on the project's ecosystem services benefits?
- Sally: Students have done macroinvertebrate sampling on project. In hindsight, she would have done both macroinvertebrate sampling and bird counts before and after the project.

Seeking Meaningful Impacts Through Green Infrastructure at Schools
Christy Perrin, Water Resources Research Institute/NC Sea Grant Sustainable Waters and Communities Coordinator

- Defining terms: She uses the term "green stormwater infrastructure" (GSI), as "green infrastructure" can be defined several ways (ie, to include land conservation, etc.)
- Christy's experience implementing GSI projects at schools spans the last 20 years, starting in the Burnt Mill Creek watershed of downtown Wilmington, NC and more recently, extensively in the Black Creek watershed in Cary.
- She learned from one of her first projects in Black Creek that above-grade landscaped islands are easy to make into bioretention areas, and that GSI in parking lots shows a big nutrient reduction impact due to the amount of polluted stormwater runoff.
- Most projects have been funded through EPA 319 grants; some through the Clean Water Management Trust Fund.

Lessons learned:
- When staff changes, you can lose your champions for a GSI projects and with it, adequate maintenance. She recommends getting teachers actively involved and making sure students, faculty, and staff actively use GSI so that they care about its maintenance.

- When planning a project, she recommends incorporating a bigger team than just stormwater engineers and outreach people—include landscape architects and environmental educators.
- Recommends incorporating team, parent and teacher feedback at all stages of the process, including planning phase.
- Know that you will need to have a flexible budget and timeline!
- Get kids to help with planting—outdoor learning makes kids happy!
- Pick the hardiest plants possible at schools.
- Design GSI to make it welcoming: have boulders around the edges of rain garden so kids will sit on the edge, use it as an amenity.
- Specific note on old landscaping at schools: Heavenly bamboo (nandina) is toxic to birds! Rip it out and replace it.
- Get art teachers to paint cisterns.
- Unless something is failing, small GSI project maintenance is relatively simple: Check 1-2x/year and plan service events, including small amount of funding for materials. She has had success getting local business and Sierra Club funding.
- UNC Environmental Finance Center interviewed staff at major cities that implement extensive GSI to with the goal of scaling up GSI on school grounds in Raleigh and Wake County public schools. They noted similar takeaways as Christy, as well as: a) that regulatory or financial drivers make it easier to scale up GSI implementation; and b) Clear expectations of all parties are key.
- Wake County Green Schools Partnership kicks off next week to help create a network among teachers. They've broadened the partnership beyond GSI to composting and gardening to create a bigger network.

Discussion

Diana Hales:
- In Siler City, people expressed concerns about safety associated with green infrastructure, and there wasn't enough staff to maintain it.
- She identified a need for more training for long-term maintenance.
- Durham has implementing watering of some athletic fields with rainwater. New school in Chatham—will reuse stormwater for field watering.

- Jen Schmitz: Wake Tech offers construction management two-year degrees. If there was demand from local governments to choose outfits with training, maybe community colleges could offer a degree in low-impact development construction management.

- Sally: UNC's stormwater budget funds landscape maintenance staff crew leads obtaining SCM inspection and maintenance certificate from NCSU. She asked, could we find minigrants for this?

1. **Questions & Open Discussion**

- Lori noted that the aesthetic benefits of GSI are the easiest one to sell.
- Christy and Diana suggested getting local businesses to sponsor maintenance of GSI. Need someone to coordinate these partnerships. Ie, a sustainability director or stormwater staff.
- Lori said that East Cary Middle School backs up to property where they plan to build affordable housing; Wake County owns the two acres in between. They'd planned to put a traditional BMP there, but these presentations changed her mind—they will put something in a more public place on school property nearby!
- Sally cited as an example that developers in Baltimore would pay for retrofits at nearby schools.
- Bill Holman suggested raising stormwater fees higher over time to incent landowners to pay for GSI elsewhere, in more effective locations offsite. Philadelphia is one example of a city that does this.

Jen asked: What are other specific challenges of implementing GSI particular to NC?

- Sally pointed out that most stormwater fees in NC aren't high enough to provide that driver.
- Peter noted that it takes a lot of political will to raise stormwater fees.
- TJ confirms this…but noted you already have a mechanism to give people credit.
- Christy said there's a perception of our soils not being good for GSI; but that's only a limited area, the Triassic Basin--and you can amend these soils.

Lori asked: If you could do anything, given the political will, what would you ask politicians to do?
- Sally: When any **government agency** is doing a development or redevelopment retrofit projects, put in some GSI alongside that's not required. Ie, street construction, sidewalk construction—for instance, this could have been done when they tore up Hillsborough Street in Raleigh.
- Christy: Require every **redevelopment** project in an urban area to do GSI. It's wasteful to dig up impervious surface and replace it with more impervious surface. People who are bearing the costs now are getting flooded.
- Peter: Move away from N/P regulation and **regulate volume** instead.
  - Sally: This works in urban and rural areas, but respectfully disagrees in downtowns.
- Sally: Chapel Hill stormwater board is giving **density bonuses** if developers implement GSI.
Peter: Put **permeable pavement** in the parking lane. If you're not doing things for regulatory purposes, it's not necessary to be working at 100%. Also, don't implement wet ponds! They have limited benefits.

Maya asked: What's the best way to pass down knowledge about GSI value and maintenance when staff turns over?

- Christy/Sally: Involve a lot of people so there's redundancy.
- Diana: Wants to get GSI implemented at schools in Chatham as the county continues growing.
- Deanna asked: Does Chatham have a Green Schools Coordinator?
- Diana hadn't heard of such thing.
- Deanna said that every high schools and most middle schools in Cumberland County have a "green teacher" and a coordinator, funded by nonprofit Sustainable Sandhills.
- Several asked: Could an NGO follow this model in the Triangle region?

Wrap-up

Lori noted that Cary has deployed Greenstream sensors as part of their stormwater management pilot project in the parts of Cary that are most vulnerable to flooding. They automatically send a case to public works, so they can deploy staff when needed.

Future meeting topics

- TJ Cawley requested as a future topic gathering information about stormwater fees, to build capacity in advance of next year's budget, especially if anyone has positive examples to share of raising their fees.
- Lori noted that Cary added watershed fees to this year's budget proposal. Also suggested Apex do similarly, using the same terminology so that the public understands the purpose of these different fees.
- TJ suggested water quality and open space (using Raleigh as a model.)
- Lori suggested presentations on any examples or models from other states that North Carolina could learn from.
- Bill Holman suggested a future meeting on green impact bonds, to leverage existing finance for larger projects and potentially attract impact investors.
- If there are any other topics you would like to see discussed at future Smart Growth/Water Resources Collaborative meetings, please let Jen or Maya know!

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2020 Meeting Calendar

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Mark your calendars! The meeting schedule for 2020 has been set. All meetings will be held 2-4pm @ TJCOG.

Thursday, March 12th - Smart Growth Collaborative - Development Trends
Thursday, June 11th - Joint Smart Growth & Water Resources Collaborative meeting (Topic TBD)
Thursday, September 10th - Joint Smart Growth & Water Resources Collaborative meeting (Topic TBD)
Thursday, December 10th - Joint Smart Growth & Water Resources Collaborative meeting (Topic TBD)