

Market-Based Stormwater Management

Today's roadmap for incentives, markets,
and crediting programs

November 2016

Table of Contents

Executive Summary.....	1
Agenda & Objectives.....	3
Final Thoughts and Take-aways From the Fall 2016 Dialogue.....	5
Next Steps: Continuing the Conversation.....	7
Appendix I: Fall 2016 Dialogue Participants	8
Appendix II: Conveners Bios	10

Executive Summary

Stormwater pollution is the only major increasing source of water pollution across much of the country (U.S. EPA, 2012) despite federal regulations and millions of dollars invested in stormwater infrastructure. Communities are in need of 1) cost-effective and innovative ways to address the drivers and impacts associated with stormwater; 2) mechanisms that distribute stormwater infrastructure where it can do the most good, which may be on private land; and 3) ways to drive private investment in stormwater management infrastructure.

These points have led the stormwater management sector to green stormwater infrastructure (GSI) as a means of retaining runoff and managing rain where it falls. GSI practices include green roofs, bioretention facilities, permeable pavements, street trees, planter boxes, bioswales, downspout disconnections, and rainwater harvesting. GSI practices have been shown to mitigate other effects of urbanization by reducing airborne particulates, reducing energy costs, lowering ambient air temperatures, and enhancing the social and economic value of urban areas.¹

Another recent trend is the use of “market-based approaches” in stormwater management, which refers to a wide array of frameworks that rely on elements inspired by the business or private sector, and deliberately work within the economic system to create action or investment that meets environmental goals. This includes trading, off-setting/mitigating, incentivizing, or subsidizing in order to provide flexibility, change behavior, or drive cost efficiencies in stormwater infrastructure investments.

On November 1st-3rd, 50+ practitioners gathered for the National Network on Water Quality Trading’s Fall Dialogue. The workshop focused on making it faster and easier to use economic instruments for stormwater management to incentivize behavior change, drive cost efficiencies, improve performance, activate new funding and financing opportunities, and to drive investment where it is needed most. The workshop agenda was designed to 1) define boundaries for the discussion; 2) identify shared terminology so that participants were speaking the same language; 3) develop a shared understanding of the state of play; 4) identify products/opportunities to make it easier for communities to navigate this topic; and 4) support the development of a community of practice by providing participants with new and expanded partnerships and the opportunity to advance the field as a thought leader.

A draft white paper was distributed prior to the workshop to support a common base of knowledge and terminology amongst participants. The white paper covered the terms and definitions that make up the universe of market-based/economic approaches, regulatory and non-regulatory drivers, policy challenges and opportunities, programmatic frameworks. The workshop agenda included: a review of this paper, panel discussions with speakers from the Chesapeake Bay and across the country, and a facilitated discussion on if/how practitioners could make use of a “road map” for economic instruments to support effective stormwater management.

Based on the discussions had over the course of the two days, a number of themes emerged:

¹ Miller, C. 2007. *Green Roof Benefits*. On-line. Available from internet, <http://www.roofmeadows.com/technical/benefits.shtml>. Accessed 2 July 2014.

Currie, A. and B. Bass. 2008. Estimates of Air Pollution Mitigation with Green Plants and Green Roofs Using the UFORE Model. *Urban Ecosystems* 11:409-422.

Wise, S. 2007. *Cities & Green Infrastructure: Examples from Chicago, Milwaukee, & Philadelphia*. Presented at U.S. EPA Wet Weather and CSO Technology Workshop. Florence, KY, September 2007.

Wise, S., J. Braden, D. Ghalayini, J. Grant, C. Kloss, E. MacMullan, S. More, F. Montalto, D. Nees, D. Nowak, S. Peck, S. Shaikh, and C. Yu. 2010. *Integrating Valuation Methods to Recognize Green Infrastructure’s Multiple Benefits*. On-line. Available from internet, http://www.cnt.org/media/CNT_CNTLIDpaper.pdf. Accessed 18 May 2014.

- **Stormwater management is interdisciplinary.** Participants recognized the importance of considering land-use planning, transportation, and waste water in discussions about stormwater management. Along similar lines, participants recognized that managing stormwater is more effective when integrated with other water management issues.
- **Stormwater programs have multiple objectives.** Most communities initiate stormwater programs to meet MS4 regulatory requirements. However, there are a host of other factors that affect how the program gets set up which may be critical in gaining support from and the public decision makers, like addressing the Endangered Species Act, extending the life of gray infrastructure, climate and equity goals, or improving quality of life for residents.
- **Focus on local values.** Stormwater is not top of mind for most homeowners or businesses, so gaining their support means meeting them where they are at and focusing the conversation around how the program addresses their individual needs and promotes shared values.
- **Language is important.** Participants noted that a common language is critical to furthering the collective understanding and acceleration of work in this space.

Moving forward, the National Network plans to publish a white paper in early 2017 summarizing important workshop findings around economic instruments that promote implementation and financing of stormwater infrastructure.

Agenda & Objectives

Market-Based Stormwater Management: Today's roadmap for incentives, markets, & crediting programs

When: November 1-3, 2016

Where: Carnegie Endowment for International Peace Conference Center; 1779 Massachusetts Avenue NW; Washington D.C.

Dialogue Objectives

1. Define consistent categories for alternative market-based approaches for stormwater management;
2. Connect lessons learned from water quality trading to market-based stormwater management approaches;
3. Provide participants with new and expanded partnerships and the opportunity to advance the field as a thought leader; and
4. Set the stage for the development of a "road map" for market based approaches to stormwater management.

Materials: see the dialogue website for each of the presentations referenced within the agenda.

November 1 - 5:30-7:30; Choate Room A/B

5:30 – 7:00pm	Welcome reception with brief remarks and introductions. Hors d'oeuvres and host bar.
	<u>Framing the issue</u> Why we are here and what we hope to accomplish over the next two days.

November 2 - 8:30-4:30; Root Room A/B/C

8:30-9:00am	Introductory remarks from conveners; goals for the dialogue.
9:00 – 10:15am	<u>Defining the universe</u> We have heard over and over that people are not speaking the same language when it comes to market-based approaches to stormwater management, often using key terms in different ways. We will briefly discuss where confusion over key terms and categories (e.g., credits, markets, trading, rebates, incentives, etc.) creates a barrier for communities new to this space, and confirm a common lexicon for the workshop. What is trading and what isn't? What is a credit? What's market-based?
10:15-10:45	Networking break

10:45am-12:00pm	<p><u>Defining the universe continued</u></p> <p>Building from the first session, this discussion will flesh out the “buckets” in which market-based approaches fall, key regulatory drivers, top policy barriers, and programmatic frameworks.</p>
12:00-1:00pm	Lunch (provided)
1:00 – 2:30pm	<p><u>Program panel part I: Spotlight on Chesapeake Bay</u></p> <p>A panel of staff and participants in existing programs around the Chesapeake Bay explores strengths and weaknesses of the chosen approach, policy and necessary preconditions, and other considerations or steps along the way. Speakers include:</p> <p>Moderator: Christophe Tulou (EPA; Senior Advisor on the Chesapeake Bay) Panelists:</p> <ul style="list-style-type: none"> • Allan Brockenbrough (Virginia DEQ’s nutrient trading program) • Brian Van Wye (DDOE, Stormwater Retention Credits) • Ann English (Montgomery County, Rainscapes Rewards & Stormwater Management Credits) • Erin Hawkins (Lynchburg, VA; stormwater credit program) • Marya Levelev (MDE, status of stormwater trading in MD)
2:30-3:00pm	Networking break
3:00 – 4:30pm	<p><u>Program panel part II: Beyond the bay</u></p> <p>Panel-style session with speakers from around the country will continue the exploration of strengths and weaknesses, policy and necessary preconditions, and other considerations for market-based programs. Speakers include:</p> <p>Moderator: Dan Vizzini (Oregon Solutions, formerly Portland Bureau of Environmental Services)</p> <p>Panelists:</p> <ul style="list-style-type: none"> • Pete Yakimowich (Vaughn & Melton, discussing efforts in Chattanooga, TN) • Janet Clements (Abt Associates, discussing efforts in Grand Rapids, MI) • Ken Susilo (Geosyntec, discussing efforts in San Diego & Los Angeles, CA)
4:30pm	Adjourn for the day
November 3 - 8:30-12:00; Root Room A/B/C	
8:30-9:00am	Welcome and thoughts from yesterday
9:00am –12:00pm	<p><u>Setting the stage for a road map</u></p> <p>Conveners will introduce the application and scope of WEF’s existing road map products, then lead discussions and group exercises to identify the need, appropriate scope, and components for a road map.</p>
12:00pm	Adjourn workshop

Final Thoughts and Take-aways From the Fall 2016 Dialogue

The following themes emerged from the presentations and panels of the November workshop:

- **One piece of a larger puzzle**

Throughout the workshop, we heard that economic instruments to promote, finance, and target stormwater investments are just one of many ways that communities work to meet local goals and regulatory needs. It's one piece of a larger puzzle that may include regulating development or use of LID practices, LID or green infrastructure on public properties, land-use planning and growth management strategies, and gray infrastructure investments. It is important to make clear that economic incentive programs fit within the larger stormwater management system, specifically as a means of encouraging and targeting investment on *private* property, often where the community wants to either engage individual homeowners or provide developers with flexibility in meeting stringent requirements.

- **Effective stormwater management is integrated**

Stormwater management, especially when combined with the use of economic instruments, is a topic that cuts across multiple facets of water resource management, local and regional governance, and therefore cannot be considered on its own. Throughout the dialogue, the conversation touched on land use planning, development and growth management, water infrastructure asset management, drinking water, and waste water. One of the implications is that the stormwater managers must think beyond technical challenges and consider the cultural and institutional change that may be needed in order to implement their programs, and implementing especially these kinds of approaches. This is consistent with the principles described in WEF's [Rainfall to Results](#) and other reports on effective stormwater management.

- **One program, multiple objectives**

Most communities initiate a stormwater program in order to meet the regulatory requirements of their Municipal Separate Storm Sewer System (MS4) permit. However, there are a host of other factors that affect how the program gets set up, and these are critical in public acceptance and support from decision makers. The group felt that the universe of regulatory drivers identified in the white paper is largely complete, excepting consideration of local ordinances and the Endangered Species Act. However, numerous additional non-regulatory drivers were identified including: asset management (extending the life of existing gray infrastructure), risk management and reduction (e.g., flooding), stewardship (amongst market actors, e.g., faith-based organizations), equity, health outcomes (e.g., through improved air quality, physical activity, community cohesion associated with access to nature), support for development and growth management strategies, and quality of life for urban residents.

- **All politics are local: public outreach and the importance of local values**

Stormwater is not top of mind for most homeowners or businesses, so gaining their participation and support means meeting them where they are at and focusing the conversation around how the program addresses their individual needs and promotes shared values. For instance, messages about local water quality, increasing property values, and creating jobs may be more effective than those that stress regulatory compliance or regional targets (e.g., Chesapeake Bay TMDL). It's never too early to consider local values and culture.

- **Allow for change, and expect that progress is often non-linear**

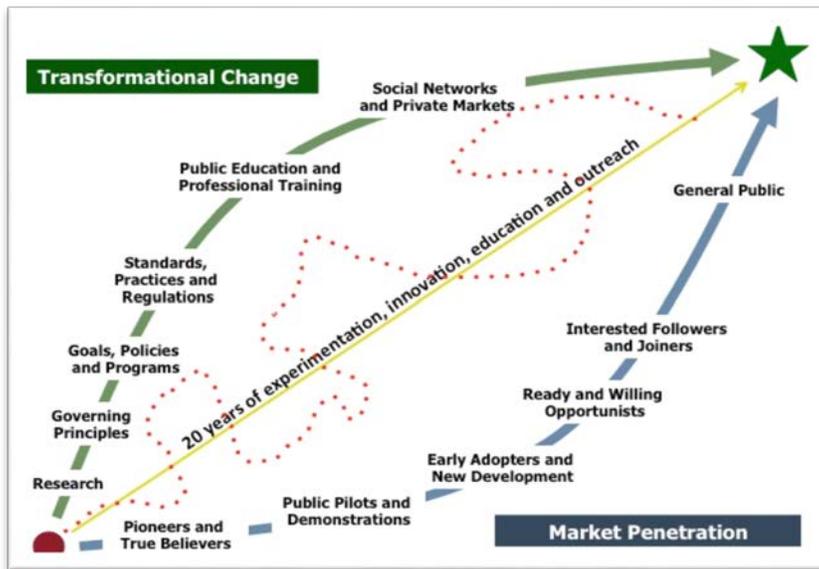


Figure 1. Image courtesy of Dan Vizzini, designed to describe the progression of Portland, Oregon's stormwater management program

Stormwater management was described in the workshop as being in its “teenage years.” A lot of growth has occurred in a fairly short period of time, but there is plenty left to learn, and the path forward is not always a straight line (see Figure 1). Those communities using economic incentives to drive stormwater management consistently reported that their programs

have changed over time. Cities like Portland and Seattle began by installing and studying demonstration green infrastructure projects, then moved to promote those practices that worked best through rebates, incentives, or updates to their stormwater manual. Other programs reported changing which practices they incentivized or how they marketed the program to the public. Stormwater program managers can expect the field to advance, bringing more good ideas and examples to draw from. It's important to make space for the program to evolve over time.

- **Terms and categories are important**

We cannot learn from each other if we don't understand each other, so speaking the same language is critical. Participants at the National Network dialogue recognized the need for clarity and consistency in the use of common terms related to stormwater management and financing. Establishing this common language allows program managers to communicate with each other in order to understand what strategies and approaches will work for their community and watershed. In review of the draft white paper, it was clear that some categories and terms need to be tweaked, particularly the use of “inter- and intra-jurisdictional,” “market-based approaches,” but overall, the paper was not far off in scope or definitions.

- **Getting from here to there: products that pave the way**

The final portion of the workshop discussed the need and potential components of a “road map.” Groups suggested a number of characteristics that describe more or less mature programs, including: strategic management, understanding of the landscape and boundaries, scale, resources; defining gaps; managing uncertainty while allowing for change, and many more.

Participants also stressed the multitude of resources that already exist, challenging organizers to think deeply about the added value of this product, to start by defining the desired outcomes (e.g., # of trading programs;, programs that progress toward a higher level of maturity;

programs are compatible, comparable, consistent), and to collaborate closely with the intended audience (stormwater program managers). Participants also noted that the idea of a roadmap was too linear, and the most useful product would be more like a GPS – taking a community from where they are to where they decide to go, and able to course correct along the way.

Next Steps: Continuing the Conversation

A draft white paper was distributed prior to the workshop to support a common base of knowledge and terminology amongst participants. The white paper covered the terms and definitions that make up the universe of market-based/economic approaches, regulatory and non-regulatory drivers, policy challenges and opportunities, and programmatic frameworks. The draft white paper will be revised based on input gathered during the workshop. A final version of the report will be released in early 2017 and will be made available on the National Network on Water Quality Trading's website (see <http://www.nnwqt.org>).

Willamette Partnership (the dialogue organizer) and along with dialogue conveners Water Environment Federation and Storm and Stream Solutions will continue to discuss the possibility of a “road map” product with partners interested in moving forward with it. As part of the mission of the National Network on Water Quality Trading is to bring together experts in the respective field, it is anticipated that participants in this dialogue will continue discussions as products are released, new opportunities to engage become available, or another gathering is planned.

Appendix I: Fall 2016 Dialogue Participants

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Appendix II: Conveners Bios

Seth Brown

Seth Brown is the Principal and Founder of Storm and Stream Solutions, LLC and Senior Stormwater Advisor for the Water Environment Federation (WEF). In his role with WEF, Seth is the staff liaison to the National Municipal Stormwater Association (NMSA), which provides a voice of the MS4 communities with a vision to provide clean water for the nation by promoting stormwater programs that are efficient, effective and based upon objective scientific information. Seth has a B.S. and an M.S. in civil engineering, and is a licensed professional engineer in the state of Maryland. Beyond his five years in the non-profit sector, he has 20 years of experience in private consulting. He is currently a PhD candidate in George Mason University's Department of Civil, Environmental and Infrastructure Engineering, and his research focuses on economic modeling of incentive-based investments of green stormwater infrastructure on private properties.

Paula Connolly

Paula is committed to making green stormwater infrastructure work in cities. She has led major policy initiatives for Philadelphia's renowned Green City, Clean Waters program, helping to change "business as usual" to implement over 30 acres of green stormwater infrastructure on vacant lands, parks, streets and private property. With the Green Infrastructure Leadership Exchange, Paula seeks to apply her vast networking experience. Prior to her work on Green City, Clean Waters, Ms. Connolly helped spearhead an award-winning collaboration of federal and state governments, non-profits, and citizens, which raised over \$3M to improve and protect the Schuylkill River Watershed – one of Philadelphia's two major drinking water sources. Ms. Connolly has degrees from the University of Notre Dame.

Dan Vizzini

Dan Vizzini spent much of his career as the public finance specialist for the City of Portland's Bureau of Environmental Services. In 2007, Dan led an effort with the City to design a stormwater marketplace under a grant from EPA, investigating a variety of market-based incentive and offset programs. His current work centers on innovative finance for solutions as varied as funding early childhood education via reductions in future Corrections budgets, and applying socially responsible investing.