

# Blue Water Baltimore Rainwater Harvesting Behavior Change Implementation

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## Abstract

Blue Water Baltimore proposes a behavior change project to increase the adoption, installation, and use of rain barrels in Herring Run and Direct Harbor watersheds to decrease stormwater runoff in Baltimore City and County. The project will test a pilot program on specific blocks in one Baltimore City and one Baltimore County neighborhood. We will shape the pilot program and address the audience's barriers and benefits as determined by the focus groups and surveys from Phase I. The pilot program will be adjusted according to evaluation results before the program is broadly implemented throughout areas of those neighborhoods.

## Behavior

*Behaviors: Rain barrel installation and use*

*Behavior Pattern: Continuous*

### Why was this behavior selected?

The proposed project supports BWB's broader mission of restoring the quality of Baltimore's rivers, streams, and harbor to foster a healthy environment, a strong economy, and thriving communities. Increasing the adoption, installation, and use of rainwater harvesting systems will help control the volume of stormwater runoff entering the storm sewer system. In addition to fulfilling BWB's mission, this project is driven by watershed plans which respond to the 2025 water quality goals established by the Chesapeake Bay Program. Increasing the adoption and use of rainwater harvesting methods will help meet the goal, "Implement a public education campaign for residents and businesses to encourage reduction of stormwater pollution," identified in the Healthy Harbor Plan for Baltimore, MD. Additionally, this project would address Baltimore County's Bear Creek/Old Road Bay (Direct Harbor) Small Watershed Action Plan which seeks to, "Promote and increase the use of rain barrels, rain gardens and bayscaping in upland areas."

### Are there component behaviors to the target behavior?

1) get rain barrel 2) install rain barrel 3) use rain barrel

### What are the competing behaviors to the target behavior?

- One challenge to adoption, installation, and use of rainwater harvesting systems by City residents is that residents are discouraged by the 400 gallon minimum capacity required to receive the Stormwater Utility credit from Baltimore City. While conducting site visits, we are often asked about the opportunity to reduce one's stormwater utility fee. Residents are often put-off and discouraged after hearing about the required seven to eight rain barrels that would be necessary to receive a fee reduction. Baltimore County is not offering any incentive to adopt rainwater harvesting systems, as the county's utility does not include a credit system for single family residential properties. Many city residents have limited outdoor space and may be reluctant to use it for a rain barrel or cistern. However, we hope that households will follow through with a rainwater harvesting system following an effective social marketing campaign, despite the challenges.
- Unlike simple environmentally-friendly practices like turning out a light or not idling your car, using rainwater harvesting systems is a multi-step process that requires regular use and maintenance. The resident must obtain the rainwater harvesting system, install the system (another multi-step process involving proper placement), and empty the system between rain events in order to reach its full potential for capturing runoff. Although the steps are not difficult, residents must follow through with each one in order to reap the benefits of having a rainwater harvesting system.
- The competing behavior is using a garden hose to water existing landscaping or gardens. This behavior is competition because it can seem more convenient and less complicated than using a rain barrel. This competition will be addressed by using easy to read, simple outreach and informational materials to describe how rain barrels function, why they are important, and their ease of use.
- Another competing behavior is doing nothing. Some residents may not use a hose or outdoor water access at all and wonder how they could benefit from a rain barrel. We will address this competing behavior by promoting the idea of slowly releasing the water by opening the spigot between rains. We will explain the slow-release concept in promotional materials and in-person during workshops. It will also be a component of the alert mechanism prompt.
- Based on data collected in the focus groups, we developed a list of six possible motivators to use rain barrels and tested them in the phone and web-based surveys. In the City, the idea of using less City water for watering plants and outdoor uses is the most popular motivator. The idea, "enough people with rain barrels and cisterns would help restore local creeks and rivers to be as clean for your children and grandchildren as you remember it when you were young," was very popular in Dundalk. We will use these motivators to develop promotional materials for the pilot neighborhoods and will adjust the materials, if needed, during broad implementation

## Target Audiences

*Audiences: Waterfront/riparian landowners, Rowhome/town home/condo owners/renters, Detached single family homeowners/renters*

*Primary Audience: Detached single family homeowners/renters*

*Secondary Audience: Rowhome/town home/condo owners/renters*

*Demographics: Black or african american, Hispanic or latino, White*

*Ages: 18-24, 25-34, 35-44, 45-54, 55-64, 65+*

## Description of Target Audience

- The target audience for the behavior change pilot project consists of two communities identified in Baltimore City and Baltimore County within the Herring Run and Direct Harbor watersheds. The community chosen in Baltimore City is Belair-Edison. In Baltimore County, we will work with Dundalk.

These communities represent diverse demographics, land use, socio-economic status, and geographic priorities and thus are ideal for reaching new audiences in the Baltimore area.

- Belair-Edison is a lower-income neighborhood located in northeast Baltimore City. Current residents are predominantly African American and long-term members of the community. Some limited gentrification is occurring in the neighborhood. It has active community groups such as Belair-Edison Neighborhoods, Inc. (BENI) and Belair-Edison Community Association. The neighborhood is a good representation of lower-income neighborhoods throughout Baltimore City, so the barrier, benefit, and competition research conducted in Phase I and pilot evaluation can be applied to similar communities. We will partner with BENI to develop and implement the pilot program on one block and expanding to a larger section of the neighborhood for broad implementation.
- Dundalk is a middle income, working-class community located in the southeastern part of Baltimore County. The community is located on the water and the motivators we heard during the barriers and benefits research reflected the influence of close water access. BWB has traditionally conducted less outreach in Dundalk, but believes it is important to target because of its connection to the water and demographic profile. We will partner with Dundalk Renaissance Corporation (DRC) for outreach efforts and to ensure effective communication with their constituents. DRC's experience in the community will help us when recruiting pilot program participants and implementing the program across the entire community.

## Attached Files

1. [BWB\\_Audience\\_Research\\_on\\_Rain\\_Barrels\\_Complete\\_Report\\_2014.pdf](#)

## Research

*How did you research your audiences: A combination of in-person interviews or focus groups and then broader surveys*

## Barriers

- Installation and use of the rainwater harvesting system are the biggest barriers to overcome. The idea of a free installation was much more popular than the idea of providing an installation kit with all necessary tools and parts. This conclusion applied to all the target audiences.
- Mentioning the environment or environmentalists may cause a disconnect with the target audience. This disconnect would be more likely in Belair-Edison.
- An emotional message focusing on restoring the waters so children and grandchildren can use it in the future is most effective at changing behavior among all audience groups.
- A campaign must address the question "what's in it for me?"
- Although in most cases rain barrels will not save residents money on a water bill, incorporating the message of less reliance on public water appeals to them. Our audience likes the idea of having to rely less on City and County water. This idea was particularly appealing to City residents in the focus groups, as they largely distrust the City government agencies.
- Good looking rain barrels must be highlighted, including the suggestion that residents decorate the containers themselves.
- "I don't plant things, so I have no use for the water," was a theme within Belair-Edison. Practical messaging must reach the audience who do not have vegetation to water. Encouraging emptying the barrel and letting the water slowly flow out of the barrel must be emphasized, especially in City neighborhoods where there may not be much green space.

- Words and graphics in materials must be simple. If there are too many words or complicated graphics, the audience will be less inclined to read or look at the materials. This is a challenge because we want to convey enough information, but not so much it makes the action seem complicated.
- Outreach materials used in Dundalk should address and focus on the community's proximity to the water.

## External factors

Some external factors include the absence or near absence of green space at residences, particularly in Belair-Edison. Also, the \$20 price, although discounted, could still be too high because Belair-Edison has a lower income when compared to the local and state median family incomes.

## Benefits

Some perceived benefits include less reliance on City water, better quality water for plants and vegetation, and a positive effect on the environment. See the Audience Research report for more details.

## Gaining insight into your target audience

- The focus groups helped us hone in on the types of promotional materials most likely to spark a change in behavior and get residents to purchase, install, and use rain barrels. In general, we found it is important to keep words and graphics simple and drive users to web-based content compatible with mobile devices. Informational pieces with practical, "how-to" information and clear graphic images scored highest in focus groups.
- One valuable piece of information we learned from the barrier-benefit research is the importance of rain barrels becoming a "social norm" among residents. Residents were most likely to adopt, install, and use a rainwater harvesting system if a neighbor, friend, or family member recommended the behavior. We will use social norms to increase the adoption of rainwater harvesting systems on entire blocks within neighborhoods. If the neighbors begin to adopt, install, and use barrels or cisterns, our findings suggest others will follow.
- We will conduct workshops in Belair-Edison and Dundalk during the pilot program and when the program is broadly implemented. BWB will hold a workshop at a resident's home, which will help develop a social norm in the neighborhood. If one resident gets a rain barrel, and can demonstrate their success to others, it will increase the likelihood of others adopting a rain barrel and successfully using it.
- Finally, improving the response of residents to empty rain barrels will be addressed using a prompt. Previous research conducted by OpinionWorks shows that, in lower income communities, individuals primarily use cell phones to access the internet. This is an opportunity for a prompt. With support from Blue Water Baltimore's partners, we will develop an app or alert mechanism to remind rain barrel adopters to empty his or her rain barrel. The alert will interpret the user's location and send a reminder when rain is predicted with a defined percentage certainty in the weather forecast. This alert will remind people to empty the barrel and, in turn, maximize the amount of water captured during every rain event. We will sign up pilot program participants for the alert at the workshops or from the landing page on the BWB website. We will continue this strategy during the broad implementation phase in these communities.

## Strategy

*Outreach Tactics: Feedback, How-to-skills, Public commitment statements, Social diffusion*

*What media/communication channels did you use? Direct mail, Events, Face to face, Small group or public meetings*

### Products and services

- Outreach materials will be developed February 2015 through April 2015. The print material content will be developed by BWB Program Coordinator with assistance from OpinionWorks and the Maryland Sea Grant Extension. The materials will include a letter and handouts. The handout will be designed in house by Blue Water Baltimore with assistance from RedStart Creative.
- The materials will be distributed and the pilot program implemented from May 2015 through early September 2015. Each household included in the pilot blocks will receive a letter as well as a handout. BWB will work with BENI and DRC to reach residents and recruit pilot program participants. The pilot program will be implemented by Blue Water Baltimore's Program Coordinator and Rain Barrel Coordinator. The Rain Barrel Coordinator will conduct a pre-survey at the time of installation.
- Pilot program evaluation will occur mid-September through October 2015. OpinionWorks will survey all residents within the pilot area to assess effectiveness of the campaign as well as attitudes towards the outreach materials. Using the results of the evaluation, messages and materials may be adjusted November 2015 through January 2016 to prepare for broad implementation. OpinionWorks will help interpret the evaluation results to best shape the broad implementation plan.
- Broad implementation will begin in February 2016 and extend through August 2016. We will collaborate with the neighborhood partners to utilize their social media outlets and other common outreach strategies such as community meetings and newsletters. A final evaluation will be conducted September through October of 2016 to determine the overall change in behavior from before and after implementation.

### Cost or Trade Off

Individuals who participate in the program are giving up \$20 to get a rain barrel. We discounted the rain barrel cost from \$89 (retail value) down to \$20 in order to provide a financial incentive.

In most cases, individuals are trading using their hose or outside water access for using a rain barrel with less water pressure.

### Place

- The target audience for this behavior change project consists of two communities identified in Baltimore City and Baltimore County within the Herring Run and Direct Harbor watersheds. The Belair-Edison community is representative of underserved and economically depressed Baltimore neighborhoods. The median household income is less than half than the state median and the poverty rate is nearly 20%. The racial composition is 90% African American and 7% Caucasian. Dundalk is an older, working class suburban Baltimore community whose income is approximately 70% of the state median and poverty rate is 10%. Dundalk is 80% Caucasian, 11% African American, and 5% Hispanic.
- Blue Water Baltimore (BWB) actively engages with these and similar communities in the Baltimore region through education & outreach and watershed restoration. Both communities have strong neighborhood groups. Belair-Edison Neighborhoods, Inc. (BENI) and Dundalk Renaissance Corporation (DRC) are strong partners and are recognized as critical to BWB's success during the pilot program, evaluation, and broad implementation.
- In the past, BWB worked with BENI and DRC to provide rain barrel workshops and present information about rain barrels at community meetings. Both community organizations supported the Phase I market analysis research, which consisted of focus groups and surveys. Further, BWB partnered with BENI on an education project to reduce trash in stormwater neighborhood-wide.

- With the help of BENI and DRC, the pilot program will target particular blocks within each neighborhood, and will reach 90 households in Dundalk and an additional 90 households in Belair-Edison. The project will result in the installation of 10 rain barrels in each neighborhood, which is a little over a 10% adoption rate.

## Primary Messages

- The project goal is to increase the number of rainwater harvesting systems adopted, installed, and used in two target neighborhoods in Baltimore City and Baltimore County by implementing a pilot behavior change project. This project will ultimately result in broad rainwater harvesting adoption through refined social marketing techniques for Baltimore area residents.
- .As rain falls on impervious surfaces, water cannot be absorbed and quickly moves to storm drains and streams, contributing to stream bank erosion and sedimentation. Further, the rain water picks up pollution and carries it to local waterways and eventually the Chesapeake Bay. Rainwater harvesting systems capture the initial runoff, slowing the stormwater to prevent stream erosion and removing excessive pollutants captured during the “first flush” of a storm. A successful campaign would decrease the volume of runoff during rain events, thereby minimizing stream bank erosion and sedimentation, while removing pollutants from the water. Additionally, improved adoption rates would decrease street flooding while preventing degradation of stormwater infrastructure.

## Attached Files

1. [BlueWaterBaltimore12808StatusReportFINAL.pdf](#)
2. [Rainwater\\_Harvesting\\_Behavior\\_Change\\_BlueWaterBaltimore.pdf](#)

## Lessons

*How did you measure impact? Survey, Other*

### Total People Reached

The rain barrel pilot program began in March 2015 with the development of outreach efforts and strategies, and connection of Blue Water Baltimore (BWB) with the pilot neighborhoods. Blue Water Baltimore Program Manager met with Dundalk Renaissance Corporation (DRC) and Belair-Edison Neighborhoods, Inc. (BENI) in March 2015 to discuss the timeline, structure, and goal of the two-year outreach and behavior change effort. Both community organizations connected BWB with community and block leaders who the community organizations thought would be most interested in participating in the rain barrel pilot program. BWB met with Watersedge Recreation Council in Dundalk and the block leader of Ardley Avenue in Belair-Edison. Both DRC and BENI assisted with reaching out to potentially interested individuals through door-to-door efforts, their one-on-one interactions as they work in the community, and neighborhood meetings. The BWB Program Manager attended the Watersedge Rec Council meeting and the Ardley Avenue block meeting to garner interest in the program and register residents for the program. Interested participants signed up for the program at both meetings.

Working with the Ardley Avenue block leader, the Program Manager set up an information session at which the rain barrel would be installed by BWB and neighbors could attend and receive more information on rain barrels. Although no neighbors attended even after showing interest in the past, the block leader suggested the Program Manager attend the upcoming block meeting to talk again about

the rain barrel program. The block leader suggested that the neighbors will have to hear about the program several times before committing to participating.

Several individuals signed up for the program at the Watersedge Recreation Council meeting, but none were interested in hosting an information session at their homes to demonstrate rain barrels. However, if several individuals are interested without having to attend an information session, it may show there is not a need for it. We evaluated the pilot program strategies as the program progressed and determine if those strategies are worth pursuing as part of broad implementation.

Audience assessment in the form of a survey was conducted at the time of installation to assess the individual's knowledge of rain barrels, the plan for use of the water, and opinions on the outreach and educational materials used throughout the pilot program. A few months after the rain barrel was installed, an additional survey was conducted to gauge the individual's use and opinion of rain barrels. The participants will also be signed up for the automatic alert which will send the participant an email or text message reminding to empty the rain barrel due to impending rain.

No more than a few months after the rain barrel was installed, an additional survey was conducted to gauge individuals' use and opinion of rain barrels. The results of the survey prompted BWB to change a few of the outreach strategies before broad implementation. For example, we received some feedback regarding the price of the barrel. Although not significantly less expensive, \$20 for a rain barrel, installation, and site visit is perceived as much cheaper than \$25. So, we offered the rain barrels at a discounted price of \$20 for the broad implementation program. Additionally, we did not see the need or interest from the residents in attending a workshop to observe a rain barrel installation, so we did not pursue that strategy as part of broad implementation. We felt it was important to establish a relationship with the residents before "selling" the rain barrel program, so instead we focused our efforts on attending community meetings and community events. Because the community organizations holding the meetings are trusted by the community residents, we felt this was a good way to build rapport and not be seen as an outside organization just trying to sell our product or ideas. Also, attending the community meetings and talking to people face-to-face was seen as a better method of communicating than mailing materials to residents who have probably not heard of Blue Water Baltimore.

Additionally, we learned the Dundalk Eagle, a weekly newspaper, is popular among Dundalk residents, particularly in learning about programs and events offered in the community. As part of our outreach efforts for broad implementation, we placed two ads in the newspaper in the Spring of 2016. Additionally, a writer for the paper interviewed an additional rain barrel participant and wrote an article about rain barrels.

Broad implementation included reaching out to residents of all of Belair-Edison and Dundalk, not just targeted neighborhoods. Attending the community meetings resulted in a good amount of interest in the program, but, ultimately, not a large number participated in the program. There were around 30 individuals who expressed interest but did not follow through with the program. To determine the reasons they did not participate in the program, OpinionWorks surveyed 15 of the 30 individuals who expressed interest and from whom we collected contact information (See attached). The results show individuals remember the presentation they saw about rain barrels, but felt they were not followed up with quickly enough. Although we aimed to contact interested parties within a week, perhaps aiming to contact them the next day would have been more effective in recruiting participants. Also, the time of year affected the likelihood of someone participating in the program. For example, if the individual heard about the program in the Fall, they were less likely to pursue the program because the weather



would turn cold soon and there would be no use for the rain barrel. For many individuals, interest was then lost over the Winter. One or two individuals viewed cost as a barrier, but most said it was very reasonable. Some residents did online research on rain barrels after hearing about the program, and they were very much interested in getting the discounted barrel for \$20.

A total of 29 rain barrels were installed in Belair-Edison and Dundalk as part of the broad implementation phase of the program. Our goal was to install 50 rain barrels. The same pre and post surveys conducted as part of the pilot program were given to the broad implementation participants

### Most significant lessons learned

The greatest success of the program is the number of rain barrel adopters who also install and use the rain barrel. Although we were only able to follow up with 17 of the 27 participants, it was clear the rain barrels are used often. By offering installation as part of the rain barrel price, we addressed the installation barrier identified in the audience research conducted in 2014. An effective program aimed at increasing the use of rain barrels would not offer rain barrels without also offering installation.

The biggest challenges of the program were having to schedule outreach opportunities to coincide with scheduled community meetings and recruiting people to follow through with a rain barrel after expressing interest. It is important to contact the community far in advance of wanting to present at a community meeting to ensure there will be time on the meeting agendas. Also, community meetings only happen at most once a month and are often put on hold during the summer, so it limits the number of times you can reach residents through that venue. It is especially important to follow up with interested individuals very quickly after collecting their contact information. If possible, we recommend following up the next day to ensure the individual remembers the information and to maintain his or her interest.

### What worked?

A survey was conducted of a combined 16 people within Belair-Edison and Dundalk who had expressed interest in a rain barrel at some point throughout the program, but ultimately decided not to get one. People had very good recall of the original contact with Blue Water Baltimore where they learned about rain barrels and expressed interest. All 16 survey participants could remember that original contact and their expression of interest in a rain barrel.

Participants had specific reasons why they wanted a rain barrel, with some expressing a conservation ethic, and others citing a practical reason such as saving money on their water bill, preventing water leaking into their basement, or using the water for their garden. Two people specifically mentioned seeing a presentation by Blue Water Baltimore, and two people were referred or encouraged by people they know.

Almost all (93%) had an intended use for the water that would be collected in the rain barrel. All of them mentioned watering their lawn, garden, trees, or other plants.

Overall, participants reacted positively to the Blue Water Baltimore personnel who were in touch with them:

- 73% said they communicated well.
- 87% said they answered their questions.
- 87% said they felt like they could relate to them, and the staff person or volunteer understood any questions or concerns they had.



#### Survey participants made these additional observations:

- 87% said they had enough information about rain barrels, leaving only
- 13% who said they had questions that were not answered.
- 67% said they remembered receiving some kind of information about rain barrels from Blue Water Baltimore.
- 50% said they specifically remembered one or more of the flyers that Blue Water Baltimore made available in-print or online.
- 

In terms of additional information they wanted, people were most likely to mention a desire to have more choices in rain barrel size or style, or whether the rain barrel could be modified, and they wondered how to find that information. One person wanted to know how to store a rain barrel when not in use.

Based on this survey and the post-survey of residents who did purchase a rain barrel, the successes included offering installation as part of the "package deal," providing flyers for painting and maintenance, and partnering with other community organizations and outlets (papers, newsletters) that may be better known within the communities.

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#### What were the most significant limiting factors to greater success?

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### Who helped you with this program/Campaign?

Blue Water Baltimore partnered with Belair-Edison Neighborhoods, Inc. and Dundalk Renaissance Corporation. Both are well-known and trusted community organizations with whom we've worked in the past. We also reached out and attended some individual neighborhood association meetings within Dundalk, as well as Belair-Edison Community Association meetings.

Because word of mouth is one of the ways individuals hear about and are convinced to get a rain barrel, it was important to establish a good relationship with residents at the time of installation.

### Attached Files

1. [Outreach\\_Restoration\\_Narrative\\_Questions\\_BWB\\_FINAL.pdf](#)