

Brandywine-Christina Healthy Water Fund

Communications Report
June 2017



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Brandywine-Christina Healthy Water Fund Communications Report

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Section 1. Introduction

Under a grant from the William Penn Foundation, The Nature Conservancy in Delaware (TNC) and the University of Delaware, Water Resources Agency are working toward implementing a water fund in the Brandywine-Christina watershed. At its most basic level, a water fund is a mechanism for downstream beneficiaries to invest in upstream conservation measures designed to secure freshwater resources – both quality and quantity – for man and nature far into the future.

The Brandywine-Christina is an integral part of the larger Delaware River Basin, and is 565 sq. mi. with $\frac{2}{3}$ of the watershed in Pennsylvania. The watershed spans three states, five counties and over 60 townships, boroughs, and cities and includes the Brandywine, Red Clay, and White Clay Creeks, and the Christina River watersheds. It provides many ecological and natural functions and provides over 100 mgd of drinking water for over half a million people. The Pennsylvania portion of the watershed is characterized by open space, including agricultural land and forests, while the more urban, southerly portion in Delaware tends to have more developed land. Only a very small piece of the watershed lies in Maryland. Legacy pollutants, nutrient overloads, failing septic systems and urban runoff have rendered the great majority of the streams, rivers and lakes in this watershed unsafe for swimming and fishing, let alone drinking.

In recent years, the Christina Basin Clean Water Partnership has funded projects to restore the waters of the watershed by piecing together grants. A lack of consistent and stable financing hampers progress in restoring the watershed. University of Delaware, Water Resources Agency and TNC propose to develop a dependable, watershed-based funding stream that will enable strategic funding for restoration projects and financing for conservation needs in the watershed to meet the water quality goals by 2025. This is a multi-year process and includes a feasibility and technical analysis, coordination with and input from key stakeholders, communications research and a business plan.

The communications research and recommendations portion of this project was undertaken to better understand best practices, the current landscape of initiatives in the watershed and to develop strategies that would assist with the successful implementation a Brandywine-Christina Healthy Water Fund. This report details the following:

1. Literature review conducted on communicating water science,
2. Existing education and outreach initiatives in the Brandywine-Christina watershed,
3. Research findings of survey work conducted in the northern portion of the watershed (Southeastern PA) and comparisons with existing research in the Brandywine-Christina watershed and the Delaware River Basin, and
4. Recommendations for future actions related to communications and engagement related to the Brandywine-Christina water fund.

Section 2. Environmental Communication

The University of Delaware, Water Resources Agency conducted a literature review of publications and resources analyzing the communication of environmental and water resource topics and issues. The information was synthesized and resulted in six common themes. These themes shall serve as guiding principles in the development of communications material about the Brandywine-Christina Healthy Water Fund (the Water Fund). These six themes, though not exhaustive, should always be considered when communicating information regarding environmental and water resource issues and more specifically, the Water Fund.

1. *Framing*

Framing is the “process of defining the context or issues that surround a problem or event in a way that serves to influence how the context or issues are seen and evaluated (psychologydictionary.org).” Framing can be used to punctuate environmental events and bring them under causation. People view incoming information through their own “frame.” Information should be presented to match the public frame, not the scientific frame. All of the ideas should be directly tied back into the audience’s overarching frame. It is important to adopt frames that the broader public will find familiar and persuasive. Environmental frames often put arguments (or environmentalists) at odds with social and cultural frames more familiar to the general public. This disparity can lead to resistance or even denial of the subject matter at hand. Pre-existing frames become extremely hard to argue against – negating scientific truths almost no matter their reality. Move away from traditional environmental science frames to broader, social and cultural frames to get the message across.

2. *Scientific “truth” may not be the most persuasive*

As scientists it is often the first inclination to share the facts and figures of the topic we are hoping to communicate. This needs to be done within reason and with deliberate recognition of the audience’s perspective. All people view information through personal, social, and cultural frames. Facts and information may be misconstrued by previous opinions or understandings. Information should be presented as simply and straightforward as possible. The public is often swayed by reasoning and not necessarily facts – emotion and shock value can be extremely persuasive. Information must be solidly founded, accurate information but it must be portrayed in a manner that sticks to the consumer of that information, namely the public.

3. *Word choice*

The words and names associated with water science and water resource topics have to be chosen in a way that will engage the public and not push them away. In connecting with the public use words that are straightforward, emotive and draw in audiences. Extensive

research and documentation is available to provide guidance on the recommended word choices based on the subject matter. For example, Resource Media's report, *Public Opinion Research Synthesis for the Delaware River Watershed Initiative*, provides recommendations on straightforward and emotive word choices to use instead of jargon and scientific words commonly used by the environmental community (Appendix A).

4. *Create a connection with the public*

Many water resource issues have a “not in my back yard” feel to them. Bringing information to the public with a local context is important. Creating a personal tie or sense of ownership and responsibility is key and should be attached to the information as to why someone should listen and act. If possible, physical interaction with the environment (watershed) in question is the best option. Where that is not realistic, getting visuals or interactive media will help bridge the gap and bring the problem closer to home.

Decision-making is potentially the strongest way to encourage public involvement – show that their actions and decisions have the potential to make a direct impact and there is clear effect from the decisions they make. Empowering the community/public and putting decisions in their hands will create ownership and a direct link between the public and water resource issues.

5. *Physical symbology*

It is important to focus on symbolism in communicating environmental ideas. Attaching meaning, or if possible sentiment, to a physical symbol can be extremely persuasive. This symbol should then be used extensively, repetitively, put on signage, literature, and in the public as much as possible.

6. *Consistent narrative*

Stick to “truth” and make sure that any debate is held on scientific, researched grounds and the messaging is consistent. Do not engage with the opposition's frame or word choice. Keep to one idea and do not jump around.

These six themes are important to consider for any environmental or water resources communications. The six themes should be used as guiding principles when developing talking points and communications related to the Water Fund. There are many communication tools and approaches to consider yet starting with these six themes in mind is a critical first step for any future communication initiatives.

Section 3. Brandywine-Christina Education and Outreach Inventory

An inventory of existing education and outreach efforts in the watershed was developed for the Brandywine-Christina Healthy Water Fund project. This inventory is useful because it is evident that there are numerous organizations conducting education and outreach in the Brandywine-Christina watershed. These groups are using a variety of materials and program types to engage a multitude of audiences. Many of the organizations (public, private and nonprofit) that are implementing these outreach initiatives are consistently engaged in education and outreach in the watershed and have a solid knowledge base and historic foundation of working with many different stakeholders in the watershed. Although many of these groups work together an inventory of the education and outreach programs that are underway in the watershed had not been developed. Once compiled this inventory can help these organization collaborate and share resources and it will also serve as a resource for the Brandywine-Christina Healthy Water Fund project team when considering future outreach and communication initiatives. In the future, the Brandywine-Christina Healthy Water Fund team may be able to work with these organizations to use existing programs, expand on these programs, or use the framework of these programs to augment communication efforts related to the Water Fund.

In addition to the numerous education and outreach programs being conducted in the watershed, the Christina Basin Education Group, established in 2014, serves as a valuable resource for the Brandywine-Christina Healthy Water Fund. This group was formed out of the need to coordinate existing and future education and outreach activities throughout the watershed in a collaborative and effective fashion. In February 2014, the Christina Basin Education Group met for the first time. The purpose of the group is for the environmental community to come together to develop and implement a series of collaborative education and outreach campaigns with a united message(s) throughout the Brandywine-Christina watershed that inspires people to act to protect water quality in their watershed. The group recognizes that a unified environmental education mission in the watershed is critical for achieving the Christina Basin TMDLs and pollution reduction goals. The group recognizes that a collaborative campaign is needed to:

- Speak with one voice,
- Deliver a clear message, and
- Reach a much larger and broader audience.

Representatives from all watershed stakeholders living or working in the Brandywine-Christina watershed (public, nonprofit and private) are invited to attend and participate in the Christina Basin Education Group. A list of the existing and potential partners is provided below:

Christina Basin Education Group Partners and Potential Partners

Artesian Water Company	New Castle County
Brandywine Conservancy	Partnership for the Delaware Estuary
Brandywine Red Clay Alliance	Pennsylvania DEP
Chester County Conservation District	Pennsylvania Municipalities
Chester County Water Resources Authority	Red Clay Valley Association
Christina Conservancy	Sierra Club
City of Newark	Land Conservancy for Southern Chester County
City of Wilmington	Stroud Water Research Center
Coalition for Natural Stream Valleys	Suez (formerly United Water Delaware)
Delaware Center for Horticulture	The Nature Conservancy, Delaware
Delaware Nature Society	USDA-NRCS
Delaware River Watershed Coalition	USEPA
DelDOT	UD, Water Resources Agency
DNREC	UD, CANR
Green Delaware	UD, Communications Department
Mount Cuba Center	UD, Environmental Health & Safety
Natural Lands Trust	White Clay Creek Wild and Scenic Mgmt Committee
New Castle Conservation District	White Clay Creek Watershed Association

The group works toward implementing a series of education recommendations for the Brandywine-Christina watershed. The goals of the group include:

- Develop and prioritize an outreach strategy for the Christina Basin based on identified education recommendations, such as those included in Delaware’s Pollution Control Strategy for the Christina Basin, the Christina TMDL Implementation Plan, and the New Castle County and DelDOT National Pollutant Discharge Elimination System (NPDES) Stormwater Pollution Prevention Plans (SWPPP).
- Implement targeted water quality campaigns in the Brandywine-Christina watershed using diverse outreach strategies.
- Enhance coordination and tracking of the existing education efforts in the watershed.
- Increase public involvement and engage the broader community in achieving the TMDLs and overall water quality goals.
- Connect the residents and stakeholders to the watershed through these education recommendations.
- Obtain funding to implement the education recommendations.

The Christina Basin Education Group has met approximately five times since 2014. After several meetings it became evident that there was not a clear understanding of the current or ongoing education and outreach activities occurring throughout the Brandywine-Christina watershed. Through the work of the Christina Basin Education Group, as well as the Brandywine-Christina Healthy Water Fund, it was clear an inventory of the programs related to education and outreach throughout the watershed would be a valuable tool. This tool would help to identify existing programs, determine key areas that were in need of work and coordinate individuals and organizations working on similar programs or working to enhance programs.

With the goals of both the Christina Basin Education Group and the Brandywine-Christina Healthy Water Fund, the University of Delaware's Water Resources Agency compiled an inventory of the existing education and outreach programs in the Brandywine-Christina watershed. This inventory provides a comprehensive look at the ongoing efforts by multiple sectors on a variety of water-related initiatives. This information was compiled through information exchange over several meetings of the Christina Basin Education group, internet searches, literature searches and email inquiries of stakeholders in the Basin. This inventory is not exhaustive but provides an extensive list of organizations conducting outreach, the types of audiences these efforts are reaching, the formats and types of initiatives and the subject matter of the initiatives in the watershed. Summary statistics from the inventory are provided in more detail below.

Brandywine-Christina Education Inventory Summary

According to the Brandywine-Christina education inventory, there are eleven public agencies (four in Pennsylvania and seven in Delaware) that have been engaged in education initiatives in the Brandywine-Christina watershed (Figure 1). The four public agencies in Pennsylvania are:

- Chester County Conservation District (CCCD)
- Chester County Water Resources Authority (CCWRA)
- Chester Water Authority
- Townships and Boroughs (several townships and boroughs grouped as one)

The seven public agencies in Delaware are:

- Delaware Department of Transportation (DelDOT)
- Delaware Department of Agriculture
- Delaware Department of Natural Resources & Environmental Control (DNREC)
- Delaware Department of Education
- New Castle County Conservation District (NCCD)
- City of Newark (Department of Public Works and Water Resources)
- City of Wilmington

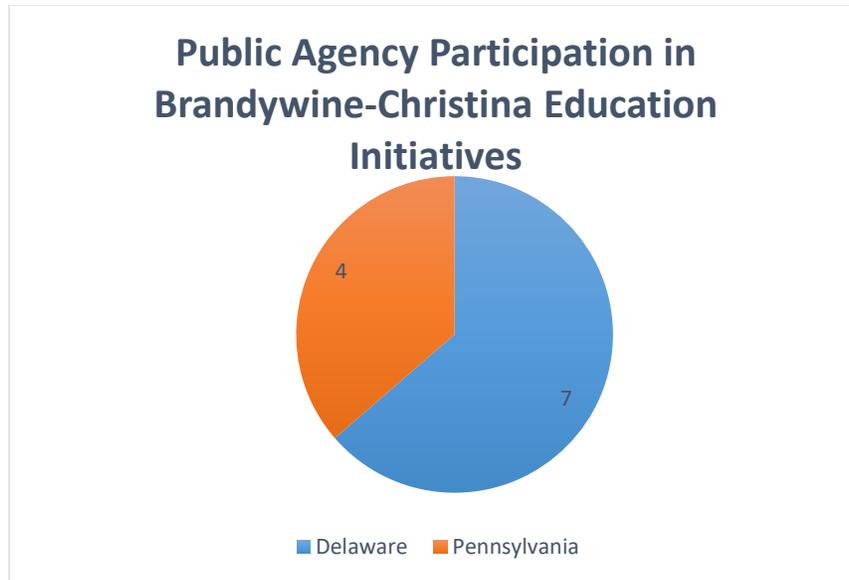


Figure 1. Public agency participation in the Brandywine-Christina

There are thirteen nonprofit agencies (four in Pennsylvania and nine in Delaware) actively engaged in education initiatives in the Brandywine-Christina (Figure 2). Although the organizations are located in distinct states the organizations are active in initiatives that cross state lines. The four nonprofit organizations in Pennsylvania include:

- Brandywine Conservancy
- Brandywine Red Clay Alliance
- Stroud Water Research Center
- White Clay Watershed Association/White Clay Wild and Scenic

The nine nonprofit organizations in Delaware include:

- Delaware Audubon Society
- Delaware Bass Federation
- Delaware Nature Society
- Partnership for the Delaware Estuary
- The Nature Conservancy, Delaware
- Widener Environmental and Natural Resources Law Clinic
- University of Delaware (Water Resources Center and Facilities)

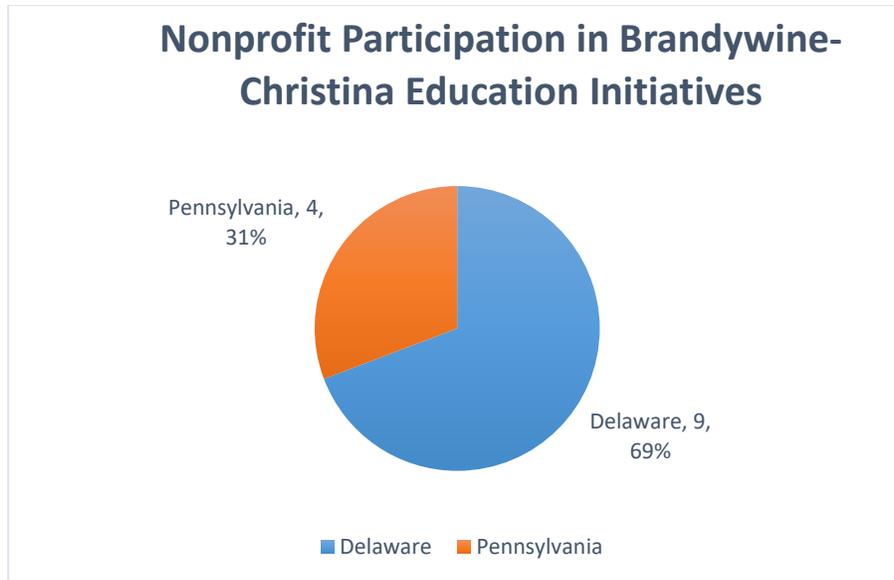


Figure 2. Nonprofit participation in the Brandywine-Christina

This inventory identified 102 distinct education initiatives in the Brandywine-Christina watershed. Among the 102 education initiatives, 70 are targeted to the general public, local residents and volunteers, 27 are targeted to students and educators, and 5 are targeted to miscellaneous groups (Figure 3). Sixty-nine percent of the initiatives are targeted to the general public, local residents and volunteers, 26 percent are targeted to students and educators, and 5 percent are targeted to miscellaneous groups.

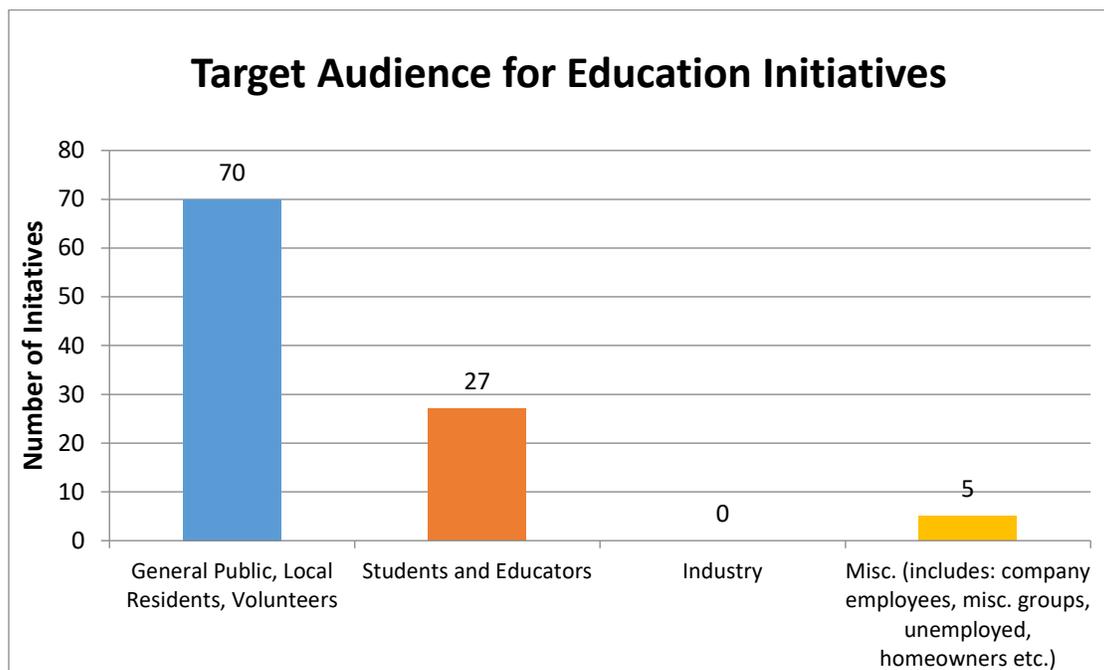


Figure 3. Target audience for education initiatives

The education initiatives in the Brandywine-Christina watershed vary by format/type. Education initiatives are presented in several formats/types, including programs, events, publications, handouts, booklets, brochures, online, displays, and other formats/types (Figure 4). The most popular format/type of education initiatives in this inventory are programs (39%), followed by events (25%), publications, handouts, booklets, and brochures (15%), online (13%), displays (6%), and other (2%).

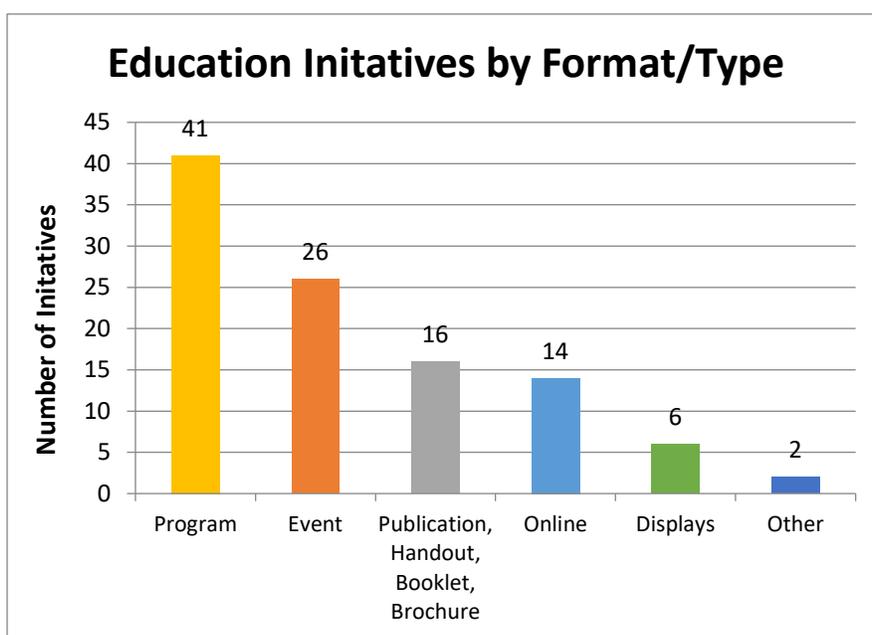


Figure 4. Education initiatives by format/type

Education Initiatives in the Brandywine-Christina vary by subject matter. Subjects include:

- Watersheds and water resources
- General environment
- Stormwater
- Agriculture, planting, food and nutrient management
- Outdoor education
- Cleanup
- Pollution reduction

The largest percentage of initiatives are on the subject of watersheds and water resources (30%), followed by stormwater (20%), general environment (18%), agriculture, planting, food, nutrient management (12%), outdoor education (9%), cleanup (6%), and pollution reduction (4%) (Figure 5).

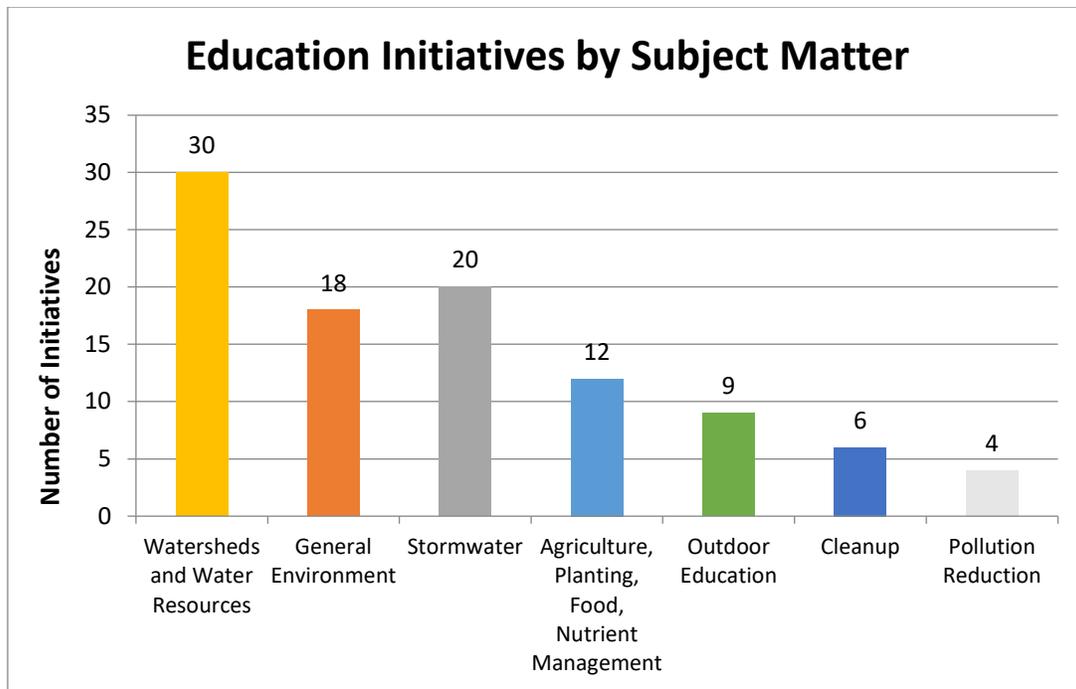


Figure 5. Education initiatives by subject matter

The data gathered in this inventory provides a valuable overview of the extensive education and outreach that is already occurring in the Brandywine-Christina watershed. The Water Fund team, when ready to develop communication programs and information, can obtain valuable knowledge and skills by coordinating with these organizations who have worked on these types of programs and in the watershed for many decades. Synergies between the Water Fund and ongoing education and outreach initiatives throughout the watershed will be ideal, valuable and necessary.

Section 4. Attitudes and Knowledge Related to Clean Water: Research Overview

An important element of the Brandywine-Christina Healthy Water Fund project is to understand the stakeholders' knowledge and attitudes related to clean water in the Brandywine-Christina watershed. For this reason, the Nature Conservancy, Delaware and the University of Delaware, Water Resources Agency initiated a research study of the Pennsylvania portion of the Brandywine-Christina watershed to understand how the public thinks about water quality, and to help inform public outreach in support of a proposed new fund for water restoration in the watershed. The study sought to gain an understanding of three key areas:

- How the public thinks about water quality, and to help inform public outreach in support of a proposed new fund for water restoration in the watershed.
- Baseline level of support for such a proposal, as well as specific priorities that the public would have for water restoration, and
- Language and imperatives that would resonate with them.

The focus area of this research, the Pennsylvania portion of the Brandywine-Christina watershed, was deliberately chosen based on prior research conducted by OpinionWorks. In retaining OpinionWorks for the Brandywine-Christina Water Fund research the team specified that the data collected should complement and take into consideration the William Penn funded research conducted by OpinionWorks in the Delaware portion of the Basin (2014) and watershed-wide in the Delaware River Basin (2016). Thus in development of the research questions and in the analysis provided in the final report, OpinionWorks considers, discusses and makes comparisons to the prior research conducted statewide as well as Delaware River watershed-wide. Additionally, OpinionWorks has conducted extensive research on attitudes and knowledge related to clean water in the Chesapeake Bay watershed and where appropriate provides commentary on regional trends.

The following is an overview of the research conducted by OpinionWorks in three key research studies. The first discussion provides key findings in the Delaware Nature Society's Delaware-based research (*Citizen Attitudes about a Clean Water Fee in Delaware*). The second summary provides an overview of the research conducted for the Partnership for the Delaware Estuary's Delaware River Basin analysis (*The Value of Water: An Innovative Financing Project*). The final summary provided in this section of the report is the research conducted in the Pennsylvania portion of the Brandywine-Christina watershed. This report provides an overview of all three research analyses and provides links to the full reports in the summaries below.

Citizen Attitudes about a Clean Water Fee in Delaware

In December 2014, the Delaware Nature Society commissioned OpinionWorks to conduct a representative statewide survey and three regional focus groups to gauge the level of support or opposition for a proposed clean water fee in Delaware. The poll of 400 randomly-selected adult Delaware residents was conducted by telephone and focus groups were conducted in each of the state's three counties among a cross-section of area residents.

In summary, Delawareans are deeply concerned about the quality of water in their local streams. Twice as many Delaware residents (36%) place water protection at or near the top of their list of concerns, as those who place it at or near the bottom (19%). Delaware residents rate their closest waterway as a "C+." Specifically, New Castle County (the southern portion of the Brandywine-Christina watershed) residents graded the Delaware River a low "C-" with 45% grading the river "D" or "F." Over 80% of Delawareans believe that their water issues can be fixed. A large majority do not believe the State is doing enough to address these water quality issues. Residents support a clean water fee by a solid 25% margin and the majority are willing to support securing funding for clean water. Fifty-seven percent of New Castle County residents supported a clean water fee. More detailed findings and recommendations from this research can be found in the report, *Citizens Attitudes about a Delaware, Clean Water Fee, December 2014* which is located at: <http://cleanwaterdelaware.org/wp-content/uploads/2017/02/Clean-Attitudes-about-a-Delaware-Clean-Water-Fee-Final-Report.pdf>

The Value of Water: An Innovative Financing Project

The Partnership for the Delaware Estuary (PDE), funded by the William Penn Foundation, completed a research project focused on collecting information about people's values and preferences in the Delaware River Basin. This project, conducted in May 2016, led by PDE, aimed to collect, compile and present data to improve the understanding of the attitudes and values of Delaware River watershed stakeholders related to watershed protection. The research and report, *The Value of Water: An Innovative Financing Project*, was part of a broader project led by the University of Maryland, Environmental Finance Center (EFC) and funded by the William Penn Foundation.

The geographic scope of this work was the Delaware River Basin, with an emphasis on the "Clusters" defined by the Delaware River Watershed Initiative (DRWI), one of which is the Brandywine-Christina cluster. The results of the work conducted in the Value of Water project are valuable for communication efforts in the Brandywine-Christina watershed. Data sets were established in clusters, such as the Brandywine-Christina, containing baseline information about watershed stakeholders and their characteristics in categories such as economic data, water supplier and users, recreational users, demographics, natural features and other useful indicators.

Additional information creating profiles used demographic and other socioeconomic data like age, income, diversity and spending patterns to characterize communities for marketing purposes. This data product developed by ESRI is called “Tapestry Segmentation.” Using the tapestry segmentation the PDE work identified dominant values and interests related to water in each of the clusters. This data analysis in the Brandywine-Christina watershed can prove useful for future implementation of education and outreach efforts related to the Brandywine-Christina Healthy Water Fund. According to PDE’s analysis, the Brandywine-Christina cluster is dominated by people who fit the “Affluent Estates” Life-Mode. Some key relevant characteristics for that Life-Mode are:

- Established wealth – educated, well-traveled married couples.
- Accustomed to “more”: less than 10% of all households, with 20% of household income.
- Homeowners (almost 90%), with mortgages (70%).
- Married couple families with children ranging from grade school to college
- Expect quality; invest in time-saving services.
- Participate actively in their communities.
- Active in sports and enthusiastic travelers.

After the baseline data and tapestry segmentation was conducted by PDE, OpinionWorks conducted focus groups to get information from people who best represented the dominant Life Mode within the cluster of interest. A focus group for the Brandywine-Christina and Schuylkill Highlands clusters was held in Downingtown, PA based on the ESRI LifeMode Affluent Estates.

The goal of the focus groups convened for this research was to explore the level of concern and engagement related to water quality among cluster residents. The focus groups also explored messages and ideas that would engage the residents most closely in the effort to restore and protect natural waters throughout the Basin (Adkins and Bouboulis, 2016). According to the *The Value of Water: An Innovative Financing Project: Final Report*, key takeaways for engaging the public from the Delaware River Basin-wide focus groups include:

- A broad perception that water quality in the Basin is impaired.
- A visible focus on contamination is an entry point for engagement. The initial connection through visible contamination is the opening to connect people with other water quality concerns.

- Drinking water is the primary touchpoint for people throughout the Basin.
- Water quality is a personal issue, not altruistic. Let people know how water pollution affects them personally.
- Keep it personal and include some sense of risk or threat. Do not create a message or conversation that is overly negative, ensure it is fact-based but emphasize the risk or threat.
- Local relevance is important.
- There is not a lot of knowledge of local groups working to improve water quality in the Basin. It is important to improve the local knowledge of organizations working to improve water quality (Adkins and Bouboulis, 2016).

According to the report, the focus groups representing Affluent Estates, the dominant life mode in the Brandywine-Christina, displayed common themes which include:

- Sense of futility about water quality and the ability to make a difference,
- Negative impressions of local water quality due to visible stressors, and
- Willingness to pay for clean water (Adkins and Bouboulis, 2016).

In summary, based on the research conducted by PDE and OpinionWorks, PDE verified that the tapestry segmentation was a useful tool in this analysis. Based on the focus group and survey work results, Adkins and Boubolis concluded that local watershed groups need to reach out and engage residents to improve public engagement and support. According to the report, it is important to connect with residents through local water amenities such as parks and rivers. The report recommends that local governments and nonprofits should team together to provide residents with information on water quality. Adkins and Bouboulis conclude that a watershed-wide outreach campaign is recommended. More detailed information regarding the conclusions and key messaging for the outreach campaign is provided in the report.

Attitudes and Knowledge Related to Clean Water: Formative Research Conducted in the Brandywine-Christina Watershed of Southeast Pennsylvania

A key component of the Brandywine-Christina Healthy Water Fund project was to assess the residents' and farmers' level of knowledge as it relates to the health of the water in the Brandywine-Christina watershed. The University of Delaware, Water Resources Agency and The Nature Conservancy, Delaware partnered with OpinionWorks to conduct this research in the Pennsylvania portion of the watershed. The research data was collected in two phases:

1. A representative population survey was conducted by telephone. The survey was conducted among 300 randomly-selected residents of the watershed (May 2016).
2. Two focus groups were held on May 12, 2016. One conducted among suburban residents and one conducted among agricultural producers in the watershed based on the dominant land uses in the Pennsylvania portion of the Brandywine-Christina watershed.

In this research the telephone survey provides a supporting role to the data collected in the focus groups. The following summarizes key points from the telephone survey and further discussion in the focus groups. The full report containing data, conclusions and recommendations can be found at: http://www.wrc.udel.edu/wp-content/uploads/2016/09/TNCBrandywine_ChristinaReportwithAppendices102016.pdf. The following is a summary of the key findings.

In order to assess the level of knowledge of the respondents as it relates to the health of water, respondents were asked to grade the health of the water closest to where they live. In the Pennsylvania portion of the watershed, the prevailing view is that the water quality is a "B-" (2.73). A majority of the respondents (54%) graded their closest water an "A" (17%) or "B" (37%) (Figure 6). For comparison, in a similar survey conducted by OpinionWorks, in Delaware (statewide) there was a slightly stronger awareness of impairment, the average grade was a "C-." In this same survey, focusing only on New Castle County (Delaware) residents, which coincides with the southern portion of the Brandywine-Christina watershed, the average grade was a "C+" (2.20) which is slightly closer to the "B-" grade in the Pennsylvania portion of the watershed. In summary, residents of this watershed did not have an overly negative view of the waters.

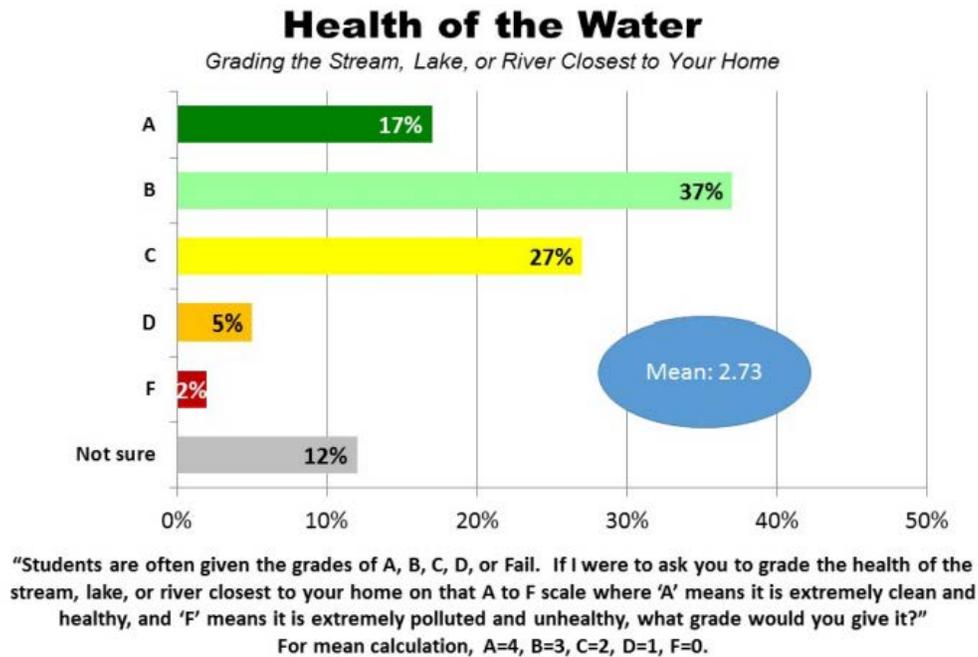


Figure 6. Health of the water (OpinionWorks, 2016)

Another key question in the survey addressed each respondent’s perception of the trend in water quality. OpinionWorks found that nearly two times as many (30%) respondents see water quality getting worse versus only 17% see it getting better, while 42% don’t see it changing (Figure 7). The perception of the trends has a strong relationship with age, younger individuals (less than 35 years old) see water quality getting worse and older individuals (older than 35 years old) see it getting better.

Trend in Water Quality

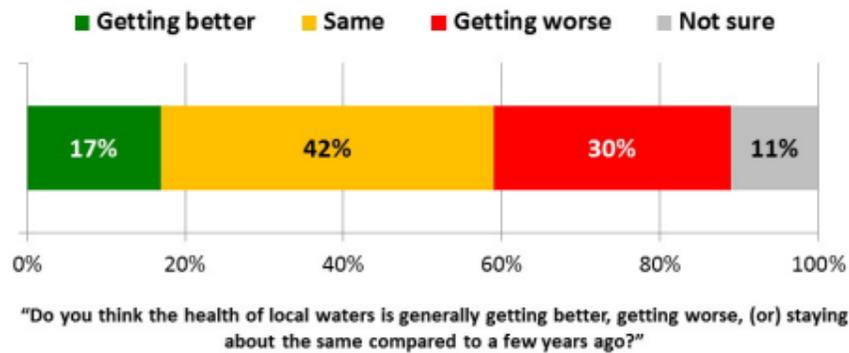


Figure 7. Trend in water quality (OpinionWorks, 2016)

The respondents were also asked to rate their personal impact on water pollution. Only 17% of the respondents think they contribute at least “somewhat” to water pollution. Almost 4 of 10 (39%) say they contribute only a “little bit” to water pollution. Nearly half (44%) feel they contribute “not at all” (Figure 8), this is an important takeaway. According to OpinionWorks, without a belief that they are contributing to water pollution personally, individual’s engagement with water restoration will rely on their willingness to be philanthropic or their sense of duty and this is not a successful formula for widespread engagement. The responses to this question are not unique to the Brandywine-Christina, in surveys in the Chesapeake Bay watershed and regionally similar responses and trends are evident. If the water quality is going to improve, it is important to find a way through surrogates or open conversation with the public about their role in water pollution and how we share responsibility. The public needs to increasingly understand they have a role.

Personal Impact on Water Quality

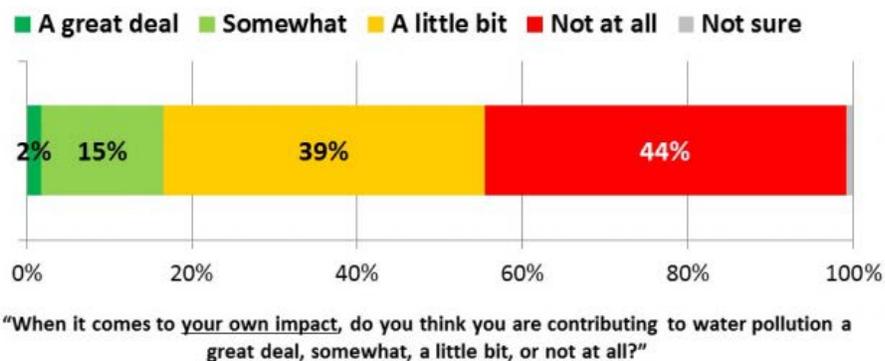


Figure 8. Personal impact on water quality (OpinionWorks, 2016)

The respondents were asked direct questions related to the safety of drinking water because a concern for water quality is often driven by an individual's worry about the health and safety of tap water or local seafood. In this survey, the research shows nearly half (47%) of the respondents expressed concerns about the safety of drinking water (Figure 9). In Delaware, in the similar study, concern was higher with nearly 4 of 10 (38%) expressing that they were "very concerned," and 29% were "little concerned," and in total, 67% of respondents in the statewide survey in Delaware were concerned about the safety of their drinking water. In this portion of the watershed, the safety of drinking water is not a high concern or high motivator. In other places, the safety of drinking water is typically a high concern.

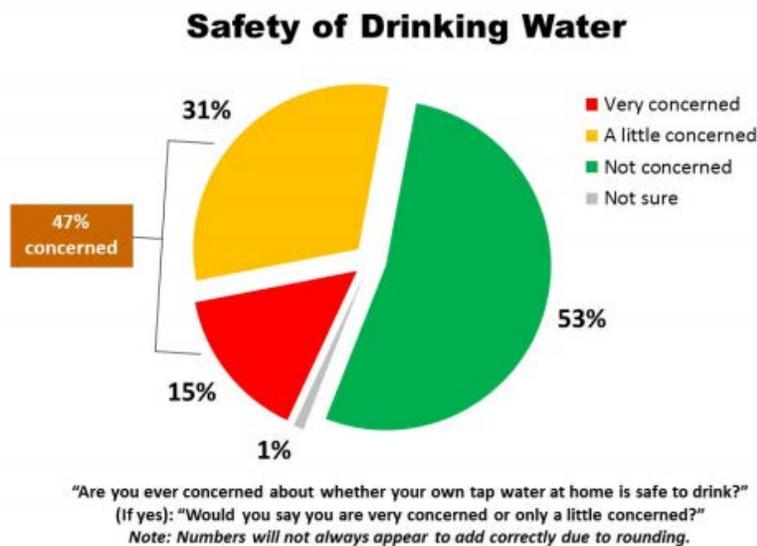
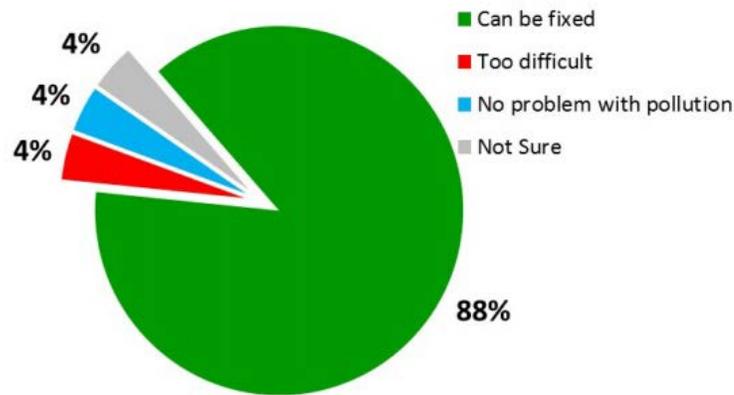


Figure 9. Safety of drinking water (OpinionWorks, 2016)

In this survey there was reason for optimism in the efforts to improve water quality based on the responses related to the question, "When you think about pollution in our local water, do you think the problem can be fixed or is it too difficult?" Eighty-eight percent of the respondents think the water pollution problem can be fixed (nearly 9 of 10 respondents) (Figure 10). This response rate is very positive for the sake of engaging the public in water quality initiatives. This is very encouraging for future work in improving water quality in the Pennsylvania portion of the Brandywine-Christina watershed. In Delaware, the responses were also encouraging with 82% of the respondents identifying that water pollution can be fixed. According to OpinionWorks, in the Chesapeake Bay watershed the responses were slightly more optimistic at 91% (2016).

Confidence that Water Pollution Can be Fixed

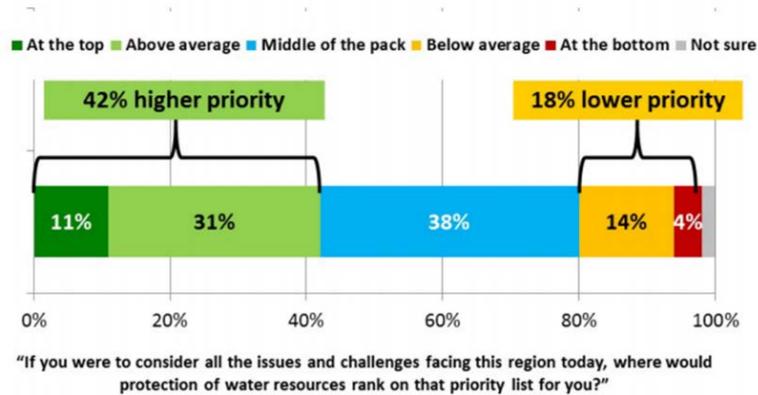


"When you think about pollution in our local waters, do you think the problem can be fixed or is it too difficult?"

Figure 10. Confidence that water pollution can be fixed (OpinionWorks, 2016)

In response to the question, at what level of priority is water resource protection, a strong underlying concern for the protection of water resources became evident. Forty-two percent of the respondents called water pollution an "above average" priority, more than twice as many that ranked it as "below average" (18%) (Figure 11). Respondents in the southeastern Pennsylvania portion of the watershed responded with a slightly higher level of concern than in a similar survey in Delaware where 36% expressed an "above average" priority as compared to the 42% in the Pennsylvania portion of the watershed.

Concern for Water Resource Protection



"If you were to consider all the issues and challenges facing this region today, where would protection of water resources rank on that priority list for you?"

Figure 11. Concern for water resource protection (OpinionWorks, 2016)

One important part of the research conducted in the southeastern Pennsylvania portion of the watershed was to explore the willingness of the public to pay (broadly speaking) for water restoration efforts. When collecting this data, the researchers did not identify a specific funding mechanism in the questionnaire or to the focus groups. Over half of the respondents (53%) support a water fee but the willingness to pay was mixed (Figure 12). A lack of trust in government and the fact that they felt overburdened already was expressed. This is in sharp contrast to the Delaware research, statewide there was a much higher willingness to pay. In the southeastern PA study, the willingness to pay is philosophically there yet there were clear stipulations when pushed for further discussion in the focus groups. Key messages received from the respondents in the focus groups were:

- The majority of residents would support a monthly fee.
- A voluntary fee (as compared to mandatory) is preferred.
- The fee should be administered by an independent, not-for-profit organization/not the government.
- The fee should be fair and equitable, everyone should pay into it.
- Public is looking for results, if fund is established it is important to communicate patience and report on progress.
- Targeted in approach.
- Sequencing the priorities of the Water Fund is important, convince public you thought about the distribution of funds and it is in a scientifically-based purposeful order. First things done are impactful.
- The administration and decision-making as it relates to the fee and how the money is spent should be transparent/clear and open.
- A strong willingness to spend money from such a fund where it is needed, even if that is upstream and well outside their own township's boundaries.

Support for a Healthy Water Fee

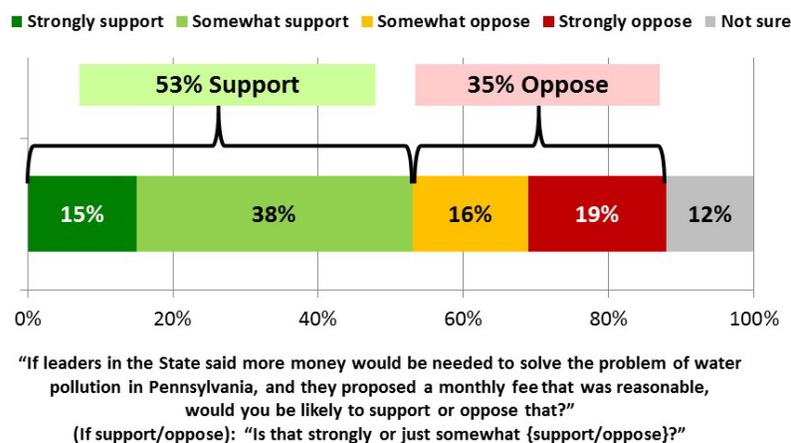


Figure 12. Support for a healthy water fee (OpinionWorks, 2016)

In the discussion related to a hypothetical or proposed water fund or fee, the respondents noted the top tier of priorities for such a fund include:

- Protecting and improving drinking water (78% very high or high priority),
- Making the water a safe place to play for kids and pets (76%), and
- Ensuring the safety of fish and shellfish you might eat (68%).

It is important to note that all of the priorities expressed by the respondents are related to personal impacts of water quality – those that would affect one’s own, or the family’s, health and safety (OpinionWorks, 2016).

The focus groups serves as a resource to further tease out additional information from the respondents. During the focus group discussions, two notable findings were identified. When the respondents were asked about factors that were weighed in terms of motivations, the strongest hit was on toxics secondarily related to contaminants. The respondents resonate strongly with removing toxics/contaminants. It is interesting that there is a positive assessment of clean water yet a deep concern for toxics. This may be due to an awareness of the industrial heritage watershed, the respondents may be aware of legacy pollution/point source pollution (OpinionWorks, 2016). These results are in contrast to the results found in the southern portion of Delaware, the concern related to toxics decreases as you move south in the state of Delaware. Concerns for toxics are higher in New Castle County (northern portion of the state, southern portion of the Brandywine-Christina watershed) similar to the Pennsylvania portion of the watershed.

Through the focus group discussions, it was also notable that the awareness of nongovernmental organizations (NGOs) is quite low in the suburban audience focus group. The agriculture audience focus group had a much higher knowledge of NGOs. Many respondents expressed they don't know where to volunteer if they wanted to help improve water quality. The respondents had a low level of expectation or trust in the government and had low expectations that a local municipality will have an ability to help. The agriculture community expressed a high trust in the local conservation district. Both the suburban and agriculture focus groups expressed a need for an independent and scientific voice as it relates to the Water Fund. Everywhere in the Delaware River watershed there is a low awareness of what local NGO groups are doing. In the Chesapeake Bay region there is a much greater awareness of local NGOs (OpinionWorks, 2016). This leads to one's ability to volunteer and if there is a lack of awareness those who want to help won't have a natural place to go. The respondents in these focus groups were hungry for an independent science-based thoughtful mediator. If an NGO is going to be a key player in the water fund, as was indicated was the desire for the Water Fund, the current level of awareness is low and needs to be addressed (OpinionWorks, 2016). This is important to note because the respondents indicated that they would welcome involvement by the NGOs in the Water Fund process and implementation because they assign a lack of financial motivation of NGOs, they trust them.

Many studies have shown that language matters. In an effort to inform future communications and outreach efforts related to the water fund, at the end of the focus group discussions, OpinionWorks led a conversation on language and the respondents' preferences and perceptions of specific words typically used in communicating information about water resources. The following is a summary of word choice and is provided in more detail in the OpinionWorks report.

- “Polluted” vs. “Contaminated” vs. “Toxic”
 - ✓ **Contaminated** – The word polluted is perceived as least serious (“dirty” or “compromised”) and able to be cleaned up while the word toxic is considered extreme, a state that may not be able to be fixed. The word contaminated resonates as meaning poisonous yet it was a split decision on whether you can clean it up or not. Contaminated is the preferred word choice of the three presented to the focus group.
- “Fund” vs. “Tax”
 - ✓ **Fund** – The word fund conveys that it will have “specialized oversight,” the respondents showed a strong positive response to the Water Fund as opposed to tax.

- “Clean Water” vs. “Healthy Water” vs. “Water Quality”
 - ✓ **Clean Water/Healthy Water/Water Quality** – All three words, clean water/healthy water/water quality, tested positive and had advocates in the focus group discussion.
- “Runoff” vs. “Stormwater”
 - ✓ **Runoff** – Focus group participants expressed that runoff is more likely to contain contaminants than stormwater. Runoff is the preferred terminology if the message is related to dirty/polluted water.
- “Excess fertilizer” vs. “Nutrients”
 - ✓ **Excess fertilizer** – In communicating about the sources of pollution, using the words, excessive fertilizer, are more understandable than nutrients. In using the word nutrients it is not apparent that water is polluted or degraded. Nutrients are often thought of as a good thing.

Overall the word preferences expressed by the respondents in this research were in line with preferences and perceptions found in both the Delaware research and data that has been collected in the Chesapeake Bay watershed.

In summary, the data collected by OpinionWorks in the southeastern portion of the watershed were valuable for identifying how the public thinks about water quality, and to help inform public outreach in support of a proposed new fund for water restoration in the watershed. It also provided an assessment of the baseline level of support for such a proposal, as well as specific priorities that the public would have for water restoration. Finally it was worthwhile in identifying specific language preferences and imperatives that would resonate with the public.

Section 5. Recommendations and Next Steps

The research conducted and summarized in this report will help to inform future actions related to communication initiatives related to the Brandywine-Christina Healthy Water Fund. A successful Water Fund will consider and use the data collected and coordinate with existing organizations and programs in the watershed. This section provides recommendations for future communications and outreach related to the Water Fund.

The outreach and education approach as it relates to the Water Fund is highly dependent upon the structure of the Water Fund. The structure of the Water Fund will determine whether the Water Fund's outreach and communications will be directed toward the public or entities/groups that will be investing directly into the Water Fund. Irrespective of the structure of the fund there are key takeaways from the data and information collected and summarized during the Brandywine-Christina Water Fund project that can assist in moving forward in any future communications or outreach campaigns. These include:

1. *Use existing tools and resources:* In the Brandywine-Christina watershed there are many groups currently engaged in public education and outreach, as discussed in Section 3 and detailed in the Brandywine-Christina Education inventory. Based on this inventory and the formation and activities of the Christina Basin Education Group the Water Fund team should collaborate with the Christina Basin Education Group and utilize existing resources and partners when developing communications and education initiatives.
2. *Incorporate research findings:* OpinionWorks has conducted extensive survey and focus group research in the Brandywine-Christina and the Delaware River watersheds. This data and the recommendations provided can be utilized in future communications and outreach work related to the Water Fund. Future research can also use the existing research conducted as building blocks for future research initiatives.
3. *Develop a communications strategy and toolkit:* Once the Water Fund structure is determined and key audiences identified, a strategy and toolkit for the Brandywine-Christina Water Fund will need to be developed.

Using Existing Resources and Tools

It is recommended that the Brandywine-Christina Healthy Water Fund team set up a working group or steering committee. An existing working group, the Christina Basin Education group, can be utilized to serve as this group. The Christina Basin Education Group is a collection of organizations and individuals engaged in outreach and education in the Brandywine-Christina (see Section 3 for more detail) and would be a valuable resource

for the Water Fund. The Christina Basin Education Group would be used as a subgroup to guide and instruct the Water Fund team on communications and education related to the water fund. This group can help to advise and provide feedback on a vision and plan for outreach related to the Water Fund. This plan would consider that there are numerous organizations and individuals throughout the watershed working on communications and outreach and synergies with these groups would prove to be most effective.

Other groups such as members of the Brandywine-Christina Cluster are working on initiatives related to communications and education in the Basin. Many of the organizations have been involved with the Christina Basin Education Group but for those who are not deliberate coordination with the cluster members and further investigation into Brandywine-Christina cluster-specific initiatives would be beneficial. Additionally, through the DRWI, Resource Media is working extensively on communications and education throughout the entire Delaware River Basin. It is necessary to collaborate with Resource Media and their ongoing work to ensure uniform messaging and coordination with the entire DRWI.

Incorporate Research Findings

The Brandywine-Christina Water Fund is a complex concept and will take a measured and deliberate communications approach. Using the OpinionWorks research, it was found that in the Pennsylvania portion of the Brandywine-Christina watershed there is a plurality willing to support a generic water fund. From this research and research conducted in Delaware it can be concluded that it is possible to get the public to accept and contribute to a water fund but the public is not starting in a strong place of support. The public is not teed up and ready, there is a strong need for significant education related to the health of the water, their role in creating and fixing the problem and cleaning it up (OpinionWorks, 2016)). OpinionWorks anticipates, based on this research, that the stakeholders in the watershed are on par to the openness of a water fund but there needs to be some baseline education and communications work conducted in order to get them up to speed to be ready to completely commit to the concept and be willing to pay into a water fund (OpinionWorks, 2016).

With this in mind, OpinionWorks recommended that when considering public outreach, the following must occur as it relates to future communications:

1. Increase the awareness of the strength of the NGO community.
2. Make a stronger argument about the impairments that exist.
3. Help the public understand their personal contributions.
4. Message specific issues/concerns to increase support.

5. Discuss how a fund can help – noting independence, accountability, etc.

It is important to note, the more groundwork that can be done to educate the public and establish a solid base of understanding, the more prepared the public will be to understand the concept and the need for a fund and ultimately accept the Water Fund.

Develop a Communications Strategy and Toolkit

Increased visibility of the project in order to build support is key. The Brandywine-Christina Healthy Water Fund will develop an action plan for a comprehensive communications and outreach campaign. In looking at efforts by established water funds, the Rio Grande Water Fund provides a valuable strategy for communications that can be adapted to the Brandywine-Christina Water Fund. Based on practices recommended from the Rio Grande Water Fund and other related projects, the Brandywine-Christina Healthy Water Fund team will create a strategy for communications that shall include:

- Creating talking points and a message blueprint advocating for the Water Fund;
- Highlighting the Water Fund in print and digital publications that are disseminated throughout the Brandywine-Christina watershed;
- Creating digital assets including web features, online slideshows, social media postings and video that can be shared throughout the watershed and can increase the visibility of the projects;
- Sharing the Water Fund story with local, regional and national media outlets, building support with multiple audiences;
- And providing opportunities for the Water Fund team, Brandywine-Christina cluster members, and partners to use Water Fund related projects and materials in their communications and marketing efforts.

In addition to the communications strategy, several communication tools that have proven successful shall be employed for the Brandywine-Christina Healthy Water Fund. For example, the Value of Water Campaign has developed a media toolkit to educate a variety of audiences (local decision-makers, stakeholders, customers) about the importance of water and the value of investing in it (<http://thevalueofwater.org/mediakit/preview>). The Brandywine-Christina Water Fund team can develop a similar style toolkit for the Water Fund. This toolkit can be developed with the Water Fund partners, the Christina Basin Education group and Resource Media. The materials can be developed collaboratively. Working collaboratively with these partners will provide additional expertise and

synergies with partners in the Brandywine-Christina watershed as well as within the Delaware River watershed. A Brandywine-Christina Water Fund toolkit may include:

- Message deck
- Ad (full page or half page templates)
- Billboards
- Bill stuffers
- Banners
- Social Media templates

Creating these templates and resources with watershed partners and sharing them across organizations and initiatives creates a consistent message and will help to reach many audiences with an effective message.

Another tool that has been used extensively and has proven extremely effective is storytelling. Research has shown that storytelling is the most effective way to engage your audience. Storytelling is simple yet relatable. The human element is the most important. Storytelling engages emotions. Stories make a point and build connections, creating emotion and making it memorable and meaningful. The Brandywine-Christina has a rich history worthy of storytelling. Using the people and places that make the Brandywine-Christina so unique and incorporating this into stories as a communication tool will be an effective strategy.

At the beginning of this project (2013), the University of Delaware, Water Resources Agency established a Brandywine-Christina Healthy Water Fund website (<http://www.wrc.udel.edu/research/brandywine-christina-healthy-water-fund-2/>). This website can serve as the starting point to increase the visibility of the project. The website will serve as a “clearing house” for the communication materials and resources. The website can also serve as a base or starting point from which to coordinate and build the Brandywine-Christina Healthy Water Fund communications strategy.

In closing, as the Water Fund project team works through the complexity of establishing a Brandywine-Christina Healthy Water Fund it is important to consider all aspects of the fund. The technical analysis, business strategy, coordination and communications are all essential pieces to the success of the Water Fund. This report provides a summary of the communications-related research conducted in the Brandywine-Christina watershed and the Delaware River Basin. It is the intent that this report provides data and recommendations that will strengthen any future communications and outreach efforts of the Brandywine-Christina Healthy Water Fund.

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Appendix A

Instead of	Use
Agricultural BMPs	Farmers caring for their land and water
Biodiversity, endangered species	Fish and wildlife, plants and animals (name specific species where possible)
Bioretention	Natural filtration
Ecosystem services	Clean drinking water ,clean air, flood protection, etc.
Environment	Land, air and water (make it as local as possible)
Green infrastructure, bioswale, etc.	Nature-based solutions, rain gardens, living roofs, etc.
Impervious surfaces	Pavement and other hard surfaces
Infiltration	Rain draining or filtering slowly into the ground
Land use planning	Planning ahead, preventing sprawl
Low Impact Development	Green or natural infrastructure
Nonpoint source pollution, stormwater	Polluted runoff
Nutrients	Excess fertilizer, pesticides, and other chemicals
Permeable surfaces	Soil and plants that filter and absorb rain water
Polluted or contaminated	Toxic
Regulations	Safeguards, protections
Riparian buffers	Forested streambanks or strip of trees along river banks
Stormwater	Runoff or polluted runoff
Tax or fee	Fund or investment
Water quality	Health of our rivers; clean, safe water to drink/swim in/etc.
Watershed	Land around rivers and streams, river system or basin (NOTE: preferred reference is to specific local waters)

Source: Resource Media, *Water Views: Public Opinion Research Synthesis for the Delaware River Watershed Initiative*, April 2017