

# HealthyHarbor

*A cleaner, greener future for our neighborhoods, streams, Harbor and Bay.*

*A Waterfront Partnership Initiative*



## **Was the Water Wheel Worth it?**

In May 2014 the Waterfront Partnership, working with Clearwater Mills, installed the world's first ever solar-powered water wheel trash interceptor at the mouth of the Jones Falls in Baltimore's Inner Harbor. Shortly after its installation a video of the Water Wheel operating during a rainstorm was posted to YouTube, where it received over 1 million views, and to Reddit, where it was voted to number one in the span of a three days. In the months that followed the Water Wheel received a frenzy of media attention that included a story on the front page of NBC.com, a Ford Motor Company commercial focused on the Water Wheel, a story on National Public Radio, and a visit from players for the Baltimore Ravens.

In all of the hype surrounding the Water Wheel, we at Waterfront Partnership wanted to take a step back and consider whether or not the Water Wheel was really worth the \$800,000 initial investment and ongoing operating costs of around \$130,000 per year. If we are going to advocate for more Water Wheels in Baltimore City at other outfalls, we need to be clear about what constitutes success with this new technology.








### **The Mission**

When Constellation Energy, the Maryland Port Administration, the Abell Foundation, and the Baltimore City Department of Public Works originally signed on to support the Water Wheel, our stated goal was to greatly reduce the amount of trash flowing from the Jones Falls into Baltimore's Inner Harbor. Our secondary goal is to show that Water

Wheels are a cost efficient way to remove trash from the water. All of the outreach and education that resulted from the popularity of the Water Wheel is a value added bonus because, while it has been terrific, it was not part of our original intent.

### Trash Removal Totals

One way to account for the Water Wheel’s success at preventing debris from entering the Inner Harbor is to look at the tonnage collected by the device. Since May 16, 2014, 47 dumpsters have been removed from the Water Wheel containing 148.36 tons or 713 cubic yards of trash and debris. Those numbers are especially impressive when the type of debris is taken into account. Because the Water Wheel collects only what floats, it tends to collect only the lightest forms of litter – plastic bags, polystyrene, cigarette butts, plastic bottles, and chip bags. Nevertheless, it collected enough of these items to average 16.48 tons per month during its first seven full months of operation. See Table 1 for a break down of the types and amounts of litter collected.

						
86,660 Plastic Bottles	110,209 Polystyrene	4,254,000 Cigarette Butts	2,200 Glass Bottles	40,660 Plastic Bags	75,379 Chip Bags	285 Sports Balls

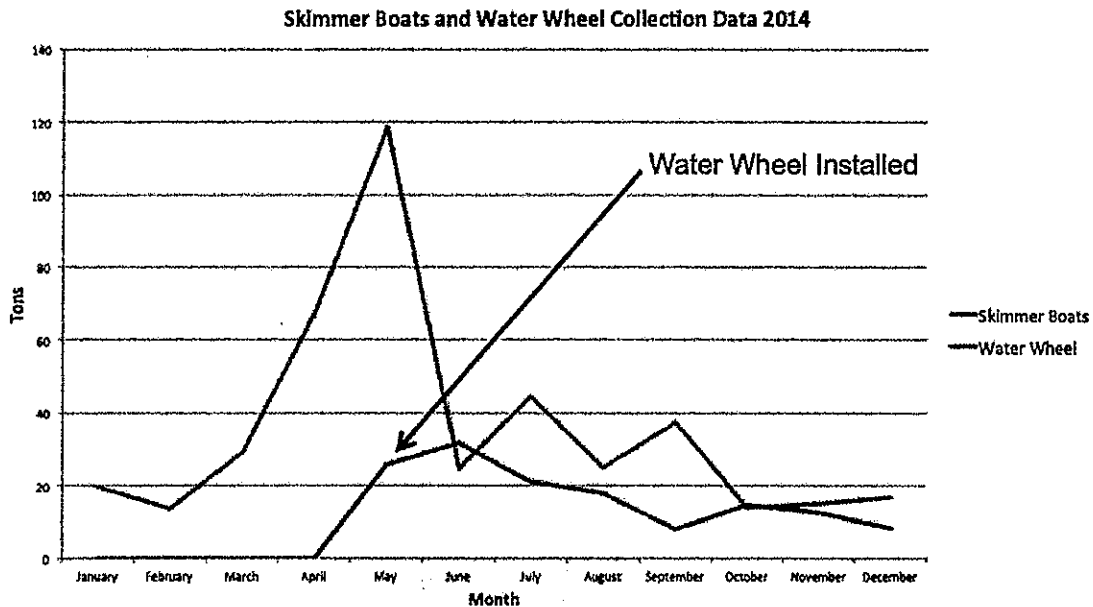
**Table 1:** Water Wheel Trash Collection Totals (May 16, 2014 through January 26, 2015)

A second metric for judging the success of the Water Wheel trash collection is to compare it to the amount of trash and debris collected by the Department of Public Works (DPW). As part of DPW’s Inner Harbor Marine Operations, they operate a fleet of trash skimmer boats and conduct periodic cleaning of litter and debris washed up on rocks and bush lines around the Harbor. In theory, if the Water Wheel is effective, we should see a decline in the amount of litter and debris collected by the City’s Marine Operations. One important caveat, however, is that if the Water Wheel is reducing the need for DPW services in the Inner Harbor, DPW may redistribute their services to parts of the Harbor not impacted by the Water Wheel thus offsetting any reductions in trash due to the Water Wheel’s operation.

To conduct this analysis, we looked at DPW Marine Operation collection totals during the months of June through December over the past three years to see if there has been a reduction during the time of the Water Wheel’s operation in 2014 (see Table 2). Prior to installation of the Water Wheel DPW collected an average of 40.31 tons per month between the months of June and December. After Water Wheel installation DPW collected an average of 25.46 tons per month in that same timeframe, a reduction of nearly 15 tons per month. During that time, the Water Wheel collected an average of 16.48 tons per month.

	Pre-Water Wheel collection average (June-Dec 2012 & 2013)	Post Water Wheel collection average (June-Dec 2014)	Reduction in tonnage collected by DPW Marine Operations
DPW Marine Operations	40.31 tons/month	25.46 tons/month	14.85 tons/month
Water Wheel Operations	n/a	16.48 tons/month	n/a

**Table 2:** Estimated impact of Water Wheel operation on the amount of marine debris collected by DPW's Marine Operations.



**Table 3:** Water Wheel and DPW skimmer boat collection totals, 2014

**Cost Efficiencies (Water Wheel vs. Skimmer Boats)**

Determining whether the Water Wheel is a cost efficient way of removing trash from the Harbor is more complicated. We know that DPW spends approximately \$1,272,587 per year on Inner Harbor Marine Operations and collects on average 420 tons per year, which is approximately \$3,030 per ton. The Water Wheel budget is \$128,900 per year to collect an estimated 300 tons or about \$430 per ton.

The Water Wheel appears to be a significant savings over DPW's operations, however, it should be noted that we lack full details on the work conducted by DPW under the Marine Operations budget – it may not all be trash related. Additionally, Water Wheel technology is not appropriate for all outfalls and the cost of intercepting trash at every contributing outfall in Baltimore Harbor would likely increase Waterfront Partnership's per ton costs. That being said, initial analysis appears to indicate that Water Wheel technology is a cost efficient way to remove trash from the water at locations where the technology makes sense (of which there are several other locations around the Baltimore Harbor).

On February 4, 2015, the Baltimore City Board of Estimates entered into an agreement with Waterfront Partnership in which the Department of Public Works will cover the direct costs of removing trash from the Water Wheel and transporting it to a waste-to-energy plant at the rate of \$140 per ton. The fact that Baltimore City is willing to contribute financially to the project clearly indicates their approval of the technology.

### Value Added Benefits

Waterfront Partnership's larger mission to clean up all major sources of pollution to the Baltimore Harbor has benefited greatly from the attention and praise that the Water Wheel project has received. These value added benefits go beyond the core mission of the Water Wheel and include impacts on both traditional and social media that reach beyond the City of Baltimore. The Water Wheel video posted to YouTube has received to date 1,168,498 views from 220 countries and all 50 states (see tables 4 and 5).

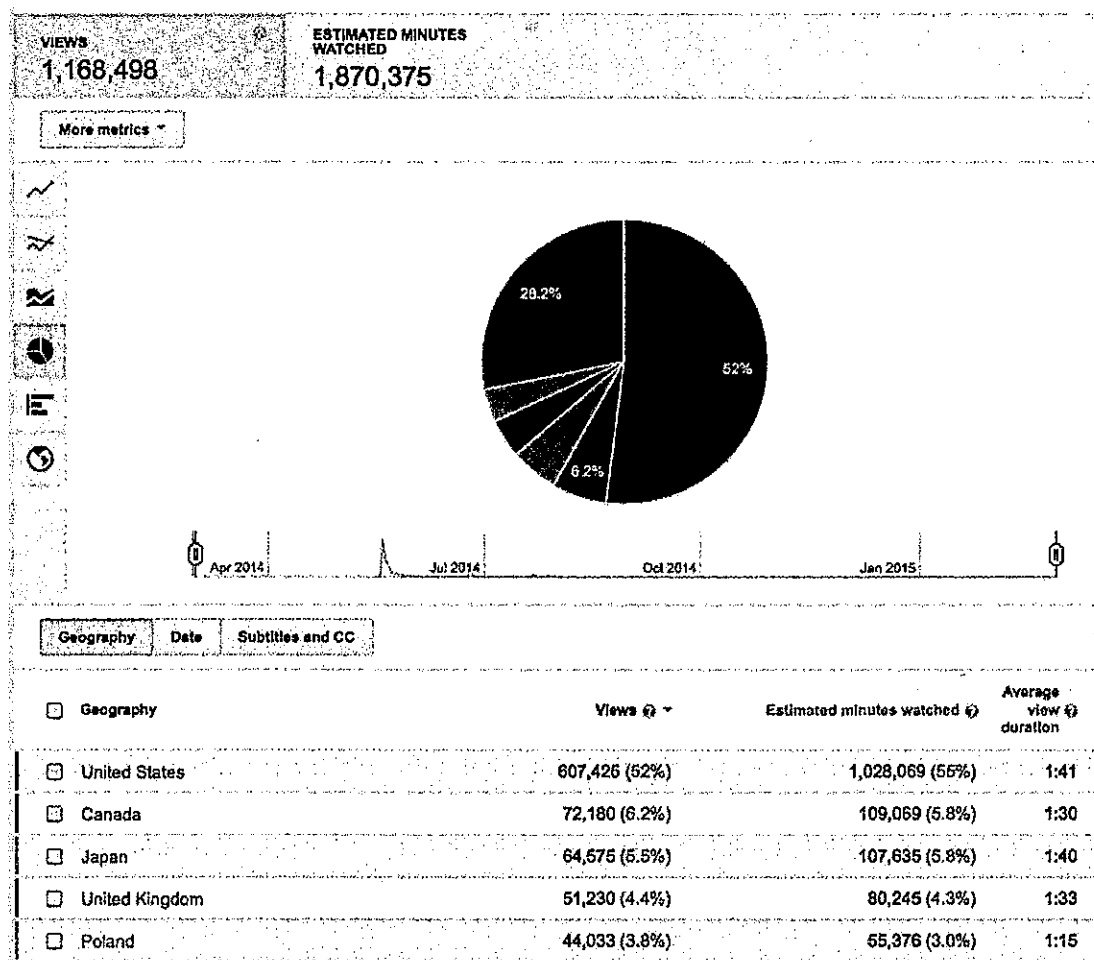
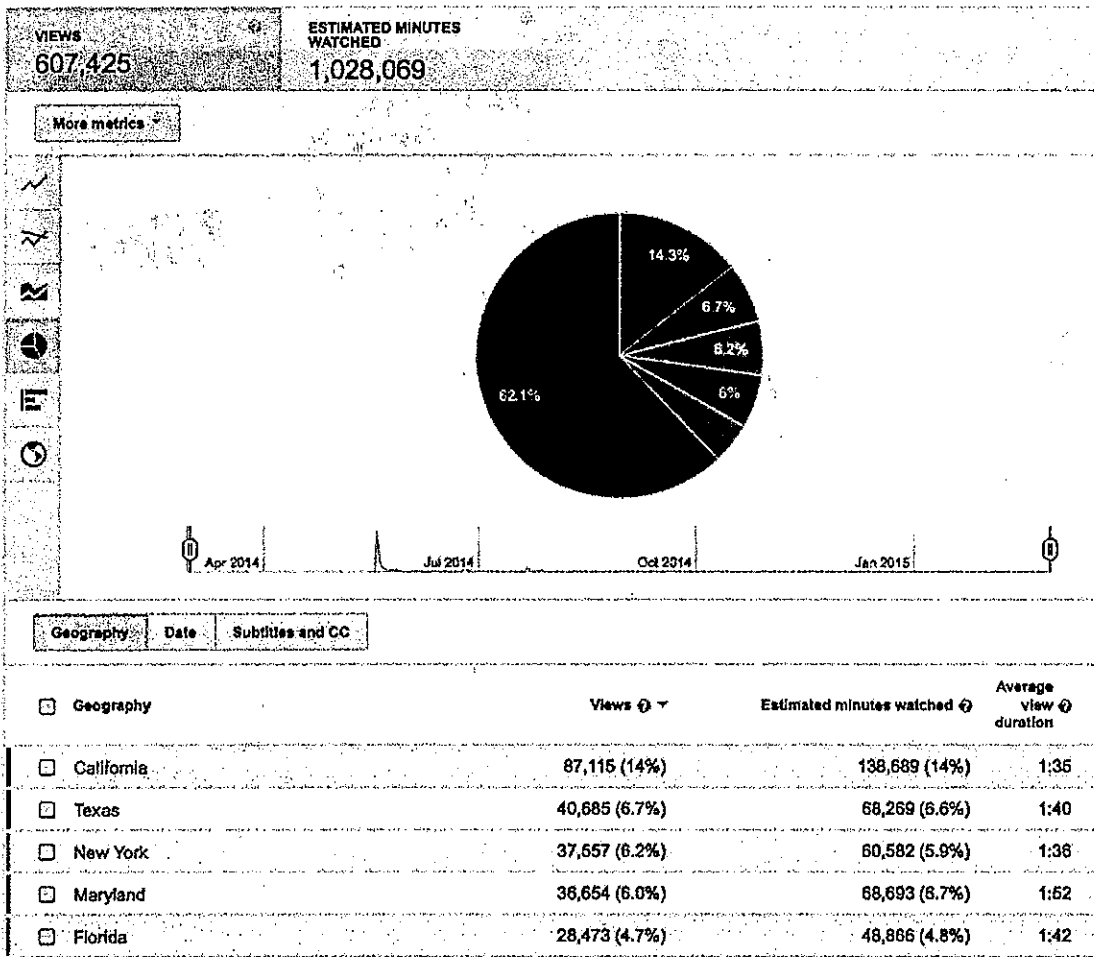


Table 4: Global YouTube video performance and top five viewing countries



**Table 5: National YouTube video performance and top five viewing states**

The popularity of the YouTube video spawned a post on the popular website Reddit.com where it was voted by users to the number one spot and received 1,465 comments (see Image 1). Since the Water Wheel’s installation, Waterfront Partnership has documented 85 different new stories, blog posts, and videos about the device (see Appendix A). The Water Wheel has even been featured in a commercial for the Ford Motor Company’s Go Further campaign and was honored with their Best Use of Technology award (see Image 2).

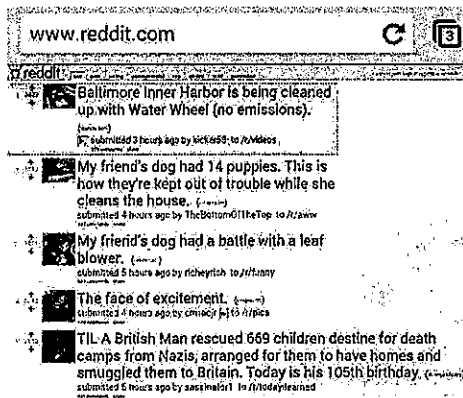


Image 1: Water Wheel video goes to number one on Reddit



Image 2: Water Wheel wins Best Use of Technology at Ford's Go Further Awards.

In October 2014 Waterfront Partnership and Clearwater Mills were invited to participate in a webinar hosted by MarineDebris.info to discuss the potential of using Water Wheel technology as a solution to plastics in the oceans. Clearwater Mills has also fielded requests from cities around the globe interested in using Water Wheel technology to clean up their own waterways. Some localities that have reached out include Rio, New Deli, Panama City, Mexico City, China (via the United Nations), Honolulu, the Netherlands, and South Africa. It is likely that other cities will have Water Wheels of their own in the not distant future.

In December 2014 the Baltimore Ravens requested a tour of the Water Wheel in conjunction with the kickoff of their GamePlanEarth campaign. Three players from the Ravens visited the Water Wheel and met with Waterfront Partnership and Clearwater Mills (see Image 3).



Image 3: Baltimore Ravens players visit the Water Wheel, December 2014

Another way that Waterfront Partnership has capitalized on the popularity of the Water Wheel is through the creation of a Twitter account called @MrTrashWheel. This account went from zero to 1,720 followers over seven months and routinely receives over 10,000 impressions per week with its highest reach of 30,700 impressions occurring the week that the Ravens visited. The Healthy Harbor Facebook page has grown by 300 followers and routinely has a weekly reach of over 1,000 with its highest reach of 4,890 occurring the first week of January 2015 when we used the account to support the City's stormwater remediation fee and a ban on plastic bags.

This Spring Waterfront Partnership will roll out an anti-litter Twitter campaign titled #IamMrTrashWheel, which will encourage followers to pick up litter, take a photo, and share it online. In other words, by cleaning up litter before it reaches the Harbor, people are "becoming" their own Mr. Trash Wheel (see Image 4).

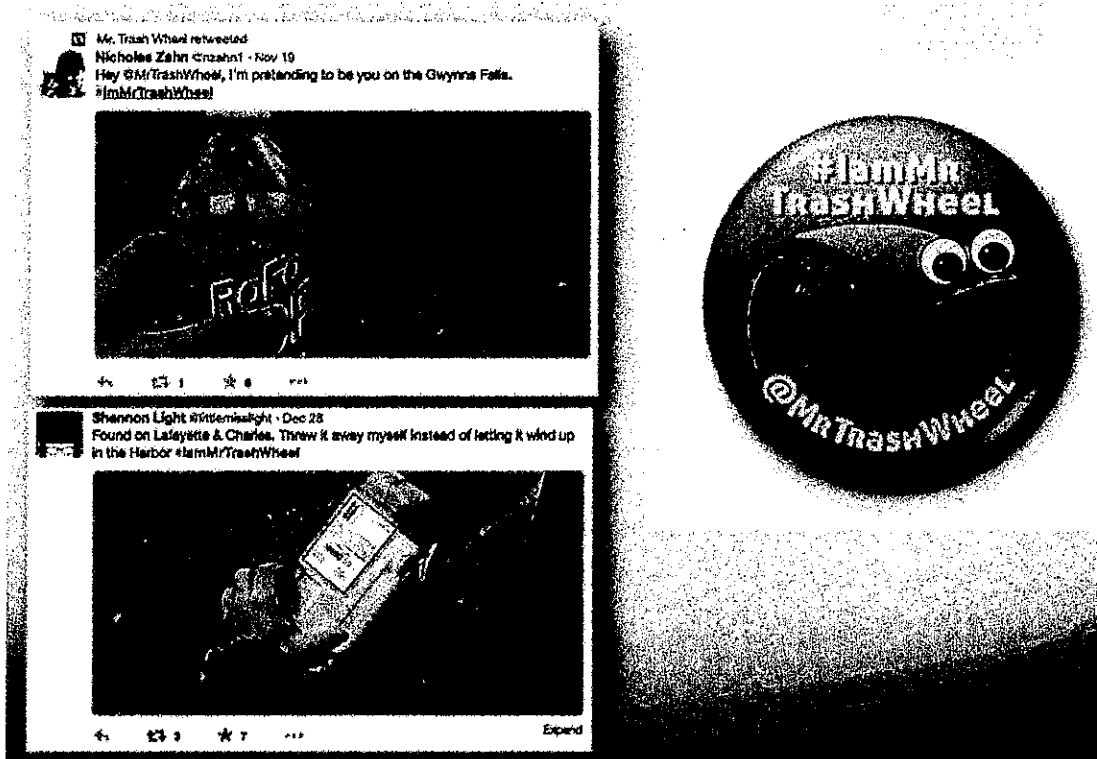


Image 4: #IamMrTrashWheel Twitter campaign examples

### Conclusions

The Water Wheel has exceeded expectations on all accounts. It is removing tons of trash annually from the Baltimore Harbor at a cost that is likely well below the cost of removing the same amount of trash using skimmer boats. Additionally, it is powered by renewable resources (solar and hydro) and operated via the Internet meaning that it has no carbon footprint and requires fewer man-hours than skimmer boats. The media

attention garnered by the device has given Waterfront Partnership a platform to promote its other environmental efforts through stories in print, TV, and online. This popularity has increased the profile of our social media accounts, expanding our ability to get our message to our audience.

In the months ahead, Waterfront Partnership will look to continue to expand our social media reach through the installation of a public webcam on the Water Wheel. We will also work to reduce our operation costs even further by ensuring that all dumpsters contain a minimum of four tons before they are removed from the device.

It is our conclusion that the Water Wheel was worth it and should be replicated. Waterfront Partnership believes this technology should be adopted as a Best Management Practice for all appropriate waterways in Baltimore, which could save the City hundreds of thousands of dollars annually on its Marine Operations budget and prevent hundreds of tons of trash from reaching the Harbor, Chesapeake Bay, and Atlantic Ocean.



Appendix A Water Wheel media stories

Date	Publication	Link	Title
6/30/14	Connect	<a href="http://www.connectyourmeetings.com/news/baltimore-reinvents-the-wheel-to-clean-harbor/">http://www.connectyourmeetings.com/news/baltimore-reinvents-the-wheel-to-clean-harbor/</a>	Baltimore Reinvents the Wheel to Clean Harbor
6/29/14	Pretty Awful Things	<a href="http://prettyawfulthings.com/2014/06/29/baltimore-water-wheel-to-gather-trash/">http://prettyawfulthings.com/2014/06/29/baltimore-water-wheel-to-gather-trash/</a>	Baltimore's Water Wheel That Gathers Trash
6/29/14	Beachapedia	<a href="http://www.beachapedia.org/State_of_the_Beach/State_Reports/MD/Water_Quality">http://www.beachapedia.org/State_of_the_Beach/State_Reports/MD/Water_Quality</a>	Cleaning Up Baltimore's Harbor
5/19/14	Grist	<a href="http://grist.org/list/this-giant-hamster-wheel-is-cleaning-up-baltimore-harbor/">http://grist.org/list/this-giant-hamster-wheel-is-cleaning-up-baltimore-harbor/</a>	This giant hamster wheel is cleaning up Baltimore Harbor
6/30/14	Northgate Sustainability Forum	<a href="http://northgate-greenteam.blogspot.com/2014/06/trash-collecting-big-wheel.html">http://northgate-greenteam.blogspot.com/2014/06/trash-collecting-big-wheel.html</a>	Trash-Collecting Big Wheel
6/26/14	Daryl Bujak News	<a href="http://darylbuja.com/7p=706">http://darylbuja.com/7p=706</a>	Baltimore's Water Wheel Keeps On Turning, Pulling In Tons Of Trash
6/26/14	Faubourg St. John	<a href="http://fsjna.org/2014/06/does-bayou-st-john-need-a-water-wheel/">http://fsjna.org/2014/06/does-bayou-st-john-need-a-water-wheel/</a>	Does Bayou St. John Need a Water Wheel?
6/30/14	Watershed Texas	<a href="http://watershedtexas.org/2014/06/30/good-news-from-baltimore/">http://watershedtexas.org/2014/06/30/good-news-from-baltimore/</a>	Good news from Baltimore
6/26/14	Environmental, Health, and Safety News	<a href="http://envnewsbits.info/2014/06/26/baltimore-water-wheel-keeps-on-turning-pulling-in-tons-of-trash/">http://envnewsbits.info/2014/06/26/baltimore-water-wheel-keeps-on-turning-pulling-in-tons-of-trash/</a>	Baltimore's Water Wheel Keeps On Turning, Pulling In Tons Of Trash
6/25/14	riepolitic	<a href="http://riepolitic.com/2014/06/25/solar-powered-water-wheel-can-clean-50000-pounds-of-trash-per-day/">http://riepolitic.com/2014/06/25/solar-powered-water-wheel-can-clean-50000-pounds-of-trash-per-day/</a>	Solar-Powered Water Wheel Can Clean 50,000 Pounds of Trash Per Day
6/27/14	EarthTechling	<a href="http://earthtechling.com/2014/06/solar-powered-water-wheel-can-clean-50000-pounds-of-trash-per-day/">http://earthtechling.com/2014/06/solar-powered-water-wheel-can-clean-50000-pounds-of-trash-per-day/</a>	Solar-Powered Water Wheel Can Clean 50,000 Pounds of Trash Per Day
7/11/14	Kuow.org	<a href="http://kuow.org/post/baltimore-water-wheel-keeps-turning-pulling-tons-trash">http://kuow.org/post/baltimore-water-wheel-keeps-turning-pulling-tons-trash</a>	Baltimore's Water Wheel Keeps On Turning, Pulling In Tons Of Trash
6/30/14	PBH2	<a href="http://www.pbh2.com/science-nature/the-water-wheel-that-is-cleaning-up-baltimore-inner-harbor/">http://www.pbh2.com/science-nature/the-water-wheel-that-is-cleaning-up-baltimore-inner-harbor/</a>	The Water Wheel That Is Cleaning Up Baltimore's Inner Harbor
6/23/14	NPR	<a href="http://www.npr.org/2014/06/23/324738205/baltimore-water-wheel-keeps-on-turning-pulling-in-tons-of-trash">http://www.npr.org/2014/06/23/324738205/baltimore-water-wheel-keeps-on-turning-pulling-in-tons-of-trash</a>	Baltimore's Water Wheel Keeps On Turning, Pulling In Tons Of Trash
6/25/14	EcoWatch	<a href="http://ecowatch.com/2014/06/25/solar-water-wheel-trash-baltimore-inner-harbor/">http://ecowatch.com/2014/06/25/solar-water-wheel-trash-baltimore-inner-harbor/</a>	How a Solar-Powered Water Wheel Can Clean 50,000 Pounds of Trash Per Day From Baltimore's Inner Harbor
6/28/14	Elephant Journal	<a href="http://www.elephantjournal.com/2014/06/baltimore-trashy-makeover-melissa-horton-video/">http://www.elephantjournal.com/2014/06/baltimore-trashy-makeover-melissa-horton-video/</a>	Baltimore's Trashy Makeover
6/30/14	Real Clear	<a href="http://www.realclear.com/living/2014/06/26/oddball_contrapion_removes_tons_of_trash_from_baltimore_harbor_7618.html">http://www.realclear.com/living/2014/06/26/oddball_contrapion_removes_tons_of_trash_from_baltimore_harbor_7618.html</a>	Oddball Contraption Purifies Baltimore's Filthy Harbor
6/27/14	Van Aqua	<a href="http://www.vanaqua.org/files%2F2014%2F0390%2F3224%2Fwater_june_27.pdf">www.vanaqua.org/files%2F2014%2F0390%2F3224%2Fwater_june_27.pdf</a>	Water Issues Update
6/27/14	Plastic Continents	<a href="http://plasticcontinents.com/2014/06/pulling-in-tons-of-trash-baltimore-water-wheel-keeps-on-turning/">http://plasticcontinents.com/2014/06/pulling-in-tons-of-trash-baltimore-water-wheel-keeps-on-turning/</a>	40 Tons Of Trash Already removed, Baltimore's Water Wheel Keeps Working Now
6/26/14	Ask FMB	<a href="http://askfmb.com/Weekly_News_Listings_June_2014.html">http://askfmb.com/Weekly_News_Listings_June_2014.html</a>	Weekly News Listings
6/26/14	Good News Network	<a href="http://www.goodnewsnetwork.org/baltimore-water-wheel-keeps-turning-pulling-tons-trash/">http://www.goodnewsnetwork.org/baltimore-water-wheel-keeps-turning-pulling-tons-trash/</a>	Baltimore's Water Wheel Keeps On Turning, Pulling In Tons Of Trash
6/26/14	Buffalo Rising	<a href="http://buffalorising.com/2014/06/clever-water-wheel-helps-to-clean-up-baltimore-inner-harbor/">http://buffalorising.com/2014/06/clever-water-wheel-helps-to-clean-up-baltimore-inner-harbor/</a>	Clever Water Wheel Helps To Clean Up Baltimore's Inner Harbor

6/26/14	Popular Mechanics	<a href="http://www.popularmechanics.com/how-to/blog/watch-this-water-wheel-clean-up-trash-from-the-baltimore-harbor-16928655">http://www.popularmechanics.com/how-to/blog/watch-this-water-wheel-clean-up-trash-from-the-baltimore-harbor-16928655</a>	Watch This Water Wheel Clean Up Trash from the Baltimore Harbor
6/26/14	CBS DC	<a href="http://washington.cblocal.com/2014/06/26/meet-the-machine-that-removed-50-tons-of-trash-from-the-inner-harbor-in-a-month/">http://washington.cblocal.com/2014/06/26/meet-the-machine-that-removed-50-tons-of-trash-from-the-inner-harbor-in-a-month/</a>	Meet The Machine That Removed 50 Tons of Trash From The Inner Harbor In a Month
6/25/14	AlterNet	<a href="http://www.alternet.org/environment/solar-powered-water-wheel-can-clean-50000-lbs-trash-day">http://www.alternet.org/environment/solar-powered-water-wheel-can-clean-50000-lbs-trash-day</a>	How a Solar-Powered Water Wheel Can Clean 50,000 Pounds of Trash Per Day From Baltimore's Inner Harbor
6/25/14	Truth Atlas	<a href="http://truthatlans.com/water-wheel-removed-40-tons-trash-baltimore-harbor/">http://truthatlans.com/water-wheel-removed-40-tons-trash-baltimore-harbor/</a>	A Water Wheel has Removed Over 40 Tons of Trash from Baltimore Harbor
6/25/14	Reddit	<a href="http://www.reddit.com/r/baltimore/comments/292koo/baltimores_water_wheel_keeps_on_turning_pulling/">http://www.reddit.com/r/baltimore/comments/292koo/baltimores_water_wheel_keeps_on_turning_pulling/</a>	Baltimore's Water Wheel Keeps On Turning, Pulling in Tons Of Trash
6/25/14	Care2	<a href="http://www.care2.com/news/member/193692282/3782991">http://www.care2.com/news/member/193692282/3782991</a>	Baltimore's Water Wheel Keeps On Turning, Pulling in Tons Of Trash
6/25/14	Laser Lenz	<a href="http://laserlenz.com/2014/06/25/baltimores-water-wheel-keeps-on-turning-pulling-in-tons-of-trash/">http://laserlenz.com/2014/06/25/baltimores-water-wheel-keeps-on-turning-pulling-in-tons-of-trash/</a>	Baltimore's Water Wheel Keeps On Turning, Pulling in Tons Of Trash
6/25/14	Panda Whale	<a href="http://pandawhale.com/post/46500/baltimores-water-wheel-keeps-on-turning-pulling-in-tons-of-trash">http://pandawhale.com/post/46500/baltimores-water-wheel-keeps-on-turning-pulling-in-tons-of-trash</a>	Baltimore's Water Wheel Keeps On Turning, Pulling in Tons Of Trash
6/25/14	Home of Khalifah	<a href="http://homeofkhalifah.blogspot.com/2014/06/solar-powered-water-wheel-clean-25-tons.html">http://homeofkhalifah.blogspot.com/2014/06/solar-powered-water-wheel-clean-25-tons.html</a>	Solar-Powered Water Wheel Clean 25 Tons of Trash Every Day
6/24/14	Sierra Club	<a href="http://www.sierraclub.org/sierra/2014-3-may-june/green-life/innovation-helps-baltimore-clean-its-act">http://www.sierraclub.org/sierra/2014-3-may-june/green-life/innovation-helps-baltimore-clean-its-act</a>	Innovation Helps Baltimore Clean Up Its Act
6/24/14	Tidewater Current	<a href="http://www.tidewatercurrent.com/2014_summer/feature2.html">http://www.tidewatercurrent.com/2014_summer/feature2.html</a>	Clearwater Mills Trash Interceptor
8/1/14	Local Color Flowers	<a href="http://www.blog.lcflco.com/search/label/Water%20Wheel">http://www.blog.lcflco.com/search/label/Water%20Wheel</a>	You Deserve a Bouquet Today: Water Wheel Trash Interceptor
6/24/14	Veooz	<a href="http://www.veooz.com/news/JHlIqJk.html">http://www.veooz.com/news/JHlIqJk.html</a>	Baltimore's Water Wheel Keeps On Turning, Pulling In Tons Of Trash
5/20/14	Huffington Post	<a href="http://www.huffingtonpost.com/2014/05/20/baltimore-water-wheel-cleaning-the-harbor_n_5358858.html">http://www.huffingtonpost.com/2014/05/20/baltimore-water-wheel-cleaning-the-harbor_n_5358858.html</a>	This Water Wheel Is Cleaning Up Baltimore's Harbor (VIDEO)
7/22/14	Bill Moyers	<a href="http://billmoyers.com/2014/07/22/solar-powered-water-wheel-can-clean-50000-pounds-of-baltimore%E2%80%99s-trash-per-day/">http://billmoyers.com/2014/07/22/solar-powered-water-wheel-can-clean-50000-pounds-of-baltimore%E2%80%99s-trash-per-day/</a>	Solar-Powered Water Wheel Can Clean 50,000 Pounds of Baltimore's Trash Per Day
1/15/08	Water Wheel Factory	<a href="http://www.waterwheelfactory.com/Baltimore.htm">http://www.waterwheelfactory.com/Baltimore.htm</a>	Water Wheel Powered Trash Interceptor
7/15/14	Baltimore Magazine	<a href="http://www.baltimoremagazine.net/2014/7/15/video-of-inner-harbors-trash-gathering-water-wheel-goes-viral">http://www.baltimoremagazine.net/2014/7/15/video-of-inner-harbors-trash-gathering-water-wheel-goes-viral</a>	Video of Inner Harbor's Trash-Gathering Water Wheel Goes Viral
5/19/14	Inhabitat	<a href="http://inhabitat.com/baltimores-solar-powered-water-wheel-devours-50000-pounds-of-harbor-trash-every-day/">http://inhabitat.com/baltimores-solar-powered-water-wheel-devours-50000-pounds-of-harbor-trash-every-day/</a>	Baltimore's Solar-Powered Water Wheel Can Devour 50,000 Pounds of Harbor Trash Every Day
7/14/14	Voice of America	<a href="http://www.voanews.com/content/water-wheel-picks-up-trash-in-baltimores-waterways/1957539.html">http://www.voanews.com/content/water-wheel-picks-up-trash-in-baltimores-waterways/1957539.html</a>	Water Wheel Picks Up Trash in Baltimore's Waterways
5/9/14	WBAL TV	<a href="http://www.wbalv.com/news/baltimores-new-water-wheel-to-capture-trash/25878202">http://www.wbalv.com/news/baltimores-new-water-wheel-to-capture-trash/25878202</a>	Baltimore's new water wheel to capture trash
7/7/14	Government Technology	<a href="http://www.govtech.com/local/Solar-Wi-Fi-Enabled-Water-Wheel-Pulls-Trash-From-Baltimore-Inner-Harbor.html">http://www.govtech.com/local/Solar-Wi-Fi-Enabled-Water-Wheel-Pulls-Trash-From-Baltimore-Inner-Harbor.html</a>	Solar, Wi-Fi-Enabled Water Wheel Pulls Trash From Baltimore's Inner Harbor
5/6/14	Baltimore Sun	<a href="http://articles.baltimoresun.com/2014-05-06/features/fs-md-harbor-trash-20140506_1_water-wheel-clearwater-mills-healthy-harbor">http://articles.baltimoresun.com/2014-05-06/features/fs-md-harbor-trash-20140506_1_water-wheel-clearwater-mills-healthy-harbor</a>	New water wheel joins fight against harbor trash

7/15/14	Yes Magazine	<a href="http://www.yesmagazine.org/planet/baltimore-s-water-wheel">http://www.yesmagazine.org/planet/baltimore-s-water-wheel</a>	This Solar-Powered Water Wheel Can Clean 50,000 Pounds of Baltimore's Trash Per Day
5/19/14	Reddit	<a href="http://www.reddit.com/r/videos/comments/25ywm6/baltimore-inner-harbor-is-being-cleaned-up-with-water-wheel-no-emissions/">http://www.reddit.com/r/videos/comments/25ywm6/baltimore-inner-harbor-is-being-cleaned-up-with-water-wheel-no-emissions/</a>	Baltimore Inner Harbor is being cleaned up with Water Wheel (no emissions).
7/25/14	Sustainable Cities Collective	<a href="http://sustainablecitiescollective.com/mark-lechevallier/282526/water-wheel-baltimore-keeps-harbor-moving">http://sustainablecitiescollective.com/mark-lechevallier/282526/water-wheel-baltimore-keeps-harbor-moving</a>	A Water Wheel In Baltimore Keeps The Harbor Moving
7/20/14	WTOP	<a href="http://www.wtop.com/41/3665853/Baltimore-using-water-wheel-to-clean-inner-harbor">http://www.wtop.com/41/3665853/Baltimore-using-water-wheel-to-clean-inner-harbor</a>	Baltimore using water wheel to clean Inner Harbor
6/3/14	Civil Engineering	<a href="http://www.asce.org/cemagazine/Article.aspx?id=23672331108#VBxQUVdX018">http://www.asce.org/cemagazine/Article.aspx?id=23672331108#VBxQUVdX018</a>	Solar-Powered Waterwheel Cleans Baltimore Harbor
7/29/14	Planetizen	<a href="http://www.planetizen.com/node/70531">http://www.planetizen.com/node/70531</a>	Baltimore Water Wheel Takes out the Trash—40 Tons since May
7/14/14	Southern Fried Science	<a href="http://www.southernfriedscience.com/?p=17362">http://www.southernfriedscience.com/?p=17362</a>	Charm City's Water Wheel: The first truly feasible ocean cleaning array is already afloat
7/28/14	National Aquarium	<a href="http://www.aqua.org/blog/2014/july/baltimore-water-wheel">http://www.aqua.org/blog/2014/july/baltimore-water-wheel</a>	Baltimore's Water Wheel (Deservedly) Earns International Attention
6/4/14	ACORE	<a href="http://www.acore.org/news/4678-baltimore-s-water-wheel-goes-viral">http://www.acore.org/news/4678-baltimore-s-water-wheel-goes-viral</a>	Baltimore's Water Wheel goes viral
6/30/14	Tree Hugger	<a href="http://www.treehugger.com/clean-technology/solar-water-wheel-could-be-solution-plastic-ocean-debris.html">http://www.treehugger.com/clean-technology/solar-water-wheel-could-be-solution-plastic-ocean-debris.html</a>	Solar Water Wheel Could be Solution to Plastic Ocean Debris
7/1/14	Ziger/Snead	<a href="http://www.zigersnead.com/projects/details/baltimore-water-wheel/">http://www.zigersnead.com/projects/details/baltimore-water-wheel/</a>	Baltimore Water Wheel
7/17/14	Matador Network	<a href="http://matadornetwork.com/change/baltimore-man-harnesses-green-energy-remove-harbor-trash/">http://matadornetwork.com/change/baltimore-man-harnesses-green-energy-remove-harbor-trash/</a>	Baltimore man builds ingenious water wheel to remove harbor trash
7/28/14	Millionaire Corner	<a href="http://millionairecorner.com/Content_Free/Water-Wheel-Cleans-Baltimore-Harbor.aspx">http://millionairecorner.com/Content_Free/Water-Wheel-Cleans-Baltimore-Harbor.aspx</a>	Water Wheel Cleans Baltimore Waterways
7/19/14	Columbia Patch	<a href="http://patch.com/maryland/columbia/columbias-baltimore-water-wheel-video-churns-out-1-million-youtube-views">http://patch.com/maryland/columbia/columbias-baltimore-water-wheel-video-churns-out-1-million-youtube-views</a>	Baltimore's Water Wheel Video Nets 1 Million YouTube Views
7/8/14	ABC2 News	<a href="http://www.abc2news.com/news/region/baltimore-city/water-wheel-street-sweeping-credited-with-the-removal-of-more-than-1k-tons-of-trash-in-baltimore">http://www.abc2news.com/news/region/baltimore-city/water-wheel-street-sweeping-credited-with-the-removal-of-more-than-1k-tons-of-trash-in-baltimore</a>	Water Wheel and Street Sweeping Credited with the removal of more 1,000 tons of trash
7/17/14	Surfer Today	<a href="http://www.surfertoday.com/environment/10657-baltimore-water-wheel-collects-trash-from-the-city-s-inner-harbor">http://www.surfertoday.com/environment/10657-baltimore-water-wheel-collects-trash-from-the-city-s-inner-harbor</a>	Baltimore Water Wheel collects trash from the city's Inner Harbor
5/21/14	Environment 360	<a href="http://e360.yale.edu/digest/trash-scooping_water_wheel_cleans_up_garbage_from_baltimore_harbor/4154/">http://e360.yale.edu/digest/trash-scooping_water_wheel_cleans_up_garbage_from_baltimore_harbor/4154/</a>	Trash-scooping Water Wheel Cleans up Garbage From Baltimore Harbor
7/22/14	Arts & Farces	<a href="http://www.farces.com/baltimore-cleans-50000-pounds-of-trash-daily-with-water-wheel/">http://www.farces.com/baltimore-cleans-50000-pounds-of-trash-daily-with-water-wheel/</a>	Baltimore cleans 50,000 pounds of trash daily with water wheel
10/1/14	National Geographic	<a href="http://blog.education.nationalgeographic.com/tag/water-wheel/">http://blog.education.nationalgeographic.com/tag/water-wheel/</a>	Wheels of Change in Baltimore
7/1/14	Box Hill Crab Cakes	<a href="http://boxhillpizzeria.com/blog/boxhill-crab-cakes/inner-harbor-water-wheel-making-a-splash/">http://boxhillpizzeria.com/blog/boxhill-crab-cakes/inner-harbor-water-wheel-making-a-splash/</a>	Inner Harbor Water Wheel Making a Splash
10/30/14	Ford	<a href="https://www.youtube.com/watch?v=evd9VWqISE">https://www.youtube.com/watch?v=evd9VWqISE</a>	A Water Wheel Powered by the River Helps Clean Baltimore Harbor / Everyday Heroes
10/30/14	CurrentCast	<a href="http://www.currentcast.org/pollution/baltimore-waterwheel/">http://www.currentcast.org/pollution/baltimore-waterwheel/</a>	Baltimore Waterwheel
10/30/14	NBC News	<a href="http://www.nbcnews.com/news/video/solar-powered-water-wheel-cleaning-baltimore-s-inner-harbor-n237031">http://www.nbcnews.com/news/video/solar-powered-water-wheel-cleaning-baltimore-s-inner-harbor-n237031</a>	Solar-Powered Water Wheel is Cleaning Baltimore's Inner Harbor
10/30/14	Marine Debris - Info	<a href="http://vimeo.com/110383893">http://vimeo.com/110383893</a>	The Baltimore Water Wheel as a Solution to ocean plastic

11/26/14	Urbanful	<a href="http://urbanful.org/2014/11/26/baltimore-trash-wheel/">http://urbanful.org/2014/11/26/baltimore-trash-wheel/</a>	Baltimore employs a new garbage collector
11/29/14	Vinzo	<a href="http://vinzo.co/a-water-wheel-powered-by-the-river-helps-clean-baltimore-harbor-go-further-everyday-heroes-ford/148289">http://vinzo.co/a-water-wheel-powered-by-the-river-helps-clean-baltimore-harbor-go-further-everyday-heroes-ford/148289</a>	A Water Wheel Powered by the River Helps Clean Baltimore Harbor Go Further Everyday Heroes Ford
11/29/14	Veeoz	<a href="http://www.veeoz.com/videos/1Hq54e0.html">http://www.veeoz.com/videos/1Hq54e0.html</a>	A Water Wheel Powered by the River Helps Clean Baltimore Harbor Go Further Everyday Heroes
12/31/14	Baltimore Business Journal	<a href="http://www.bizjournals.com/baltimore/news/2014/12/31/the-30-most-popular-baltimore-business-journal.html">http://www.bizjournals.com/baltimore/news/2014/12/31/the-30-most-popular-baltimore-business-journal.html</a>	The 30 most popular Baltimore Business Journal posts of 2014
5/7/14	Baltimore Business Journal	<a href="http://www.bizjournals.com/baltimore/news/2014/05/07/a-new-water-wheel-will-remove-tons-of-plastic.html">http://www.bizjournals.com/baltimore/news/2014/05/07/a-new-water-wheel-will-remove-tons-of-plastic.html</a>	A new water wheel will remove tons of plastic bottles, cups and cigarette butts from the Inner Harbor
1/22/15	Healthy Waters for EPA's Mid-Atlantic Region	<a href="http://blog.epa.gov/healthywaters/2015/01/taking-out-the-trash/">http://blog.epa.gov/healthywaters/2015/01/taking-out-the-trash/</a>	Taking out the Trash
2/3/15	WIMAR - ABC2 News	<a href="http://www.abc2news.com/news/region/baltimore-city/trash-collected-from-baltimores-to-be-used-for-generating-electricity">http://www.abc2news.com/news/region/baltimore-city/trash-collected-from-baltimores-to-be-used-for-generating-electricity</a>	Trash collected from Baltimore's Water Wheel to be used to generate electricity
2/3/15	WIZ - CBS Baltimore News	<a href="http://baltimore.cbslocal.com/2015/02/03/new-trash-wheel-to-help-clean-baltimore-waterway/">http://baltimore.cbslocal.com/2015/02/03/new-trash-wheel-to-help-clean-baltimore-waterway/</a>	New Trash Wheel To Help Clean Baltimore Waterway
2/3/15	WBAL	<a href="http://www.wbalv.com/news/city-to-generate-electricity-from-reclaimed-trash/31072854">http://www.wbalv.com/news/city-to-generate-electricity-from-reclaimed-trash/31072854</a>	City to generate electricity from reclaimed trash
1/30/15	Huffington Post	<a href="http://www.huffingtonpost.com/x-prize-foundation/a-new-split-on-trapping-oc_b_6583326.html">http://www.huffingtonpost.com/x-prize-foundation/a-new-split-on-trapping-oc_b_6583326.html</a>	A New Split On Trapping Ocean Trash
2/3/15	GovDelivery.com	<a href="http://content.govdelivery.com/accounts/MDBAL7/bulletins/ee7265">http://content.govdelivery.com/accounts/MDBAL7/bulletins/ee7265</a>	Mayor Rawlings-Blake Announces Baltimore is World's First City to Generate Electricity from Waterway Reclaimed Litter
2/4/15	Maryland Leader	<a href="http://www.marylandleader.com/index.php/sid/229947793">http://www.marylandleader.com/index.php/sid/229947793</a>	Tons of trash collected by Inner Harbor water wheel could be burned for energy
2/3/14	Baltimore Business Journal	<a href="http://www.bizjournals.com/baltimore/news/2015/02/03/tons-of-trash-collected-by-inner-harbor-water.html">http://www.bizjournals.com/baltimore/news/2015/02/03/tons-of-trash-collected-by-inner-harbor-water.html</a>	Tons of trash collected by Inner Harbor water wheel could be burned for energy
2/2/15	Baltimore Sun	<a href="http://www.baltimoresun.com/news/maryland/politics/blog/bal-city-to-pay-for-trash-from-inner-harbor-water-wheel-to-be-turned-into-electricity-20150202-story.html">http://www.baltimoresun.com/news/maryland/politics/blog/bal-city-to-pay-for-trash-from-inner-harbor-water-wheel-to-be-turned-into-electricity-20150202-story.html</a>	City to pay for trash from Inner Harbor Water Wheel to be turned into electricity
2/11/15	onEarth	<a href="http://www.onearth.org/earthwire/baltimore-trash-wheel">http://www.onearth.org/earthwire/baltimore-trash-wheel</a>	A Wheel Good Idea
2/11/15	Baltimore Magazine	<a href="http://www.baltimoremagazine.net/2015/2/11/inner-harbors-amazing-trash-wheel-just-got-more-amazing">http://www.baltimoremagazine.net/2015/2/11/inner-harbors-amazing-trash-wheel-just-got-more-amazing</a>	Inner Harbor's Amazing Trash Wheel Just Got Better
2/24/15	ABC2 News	<a href="http://www.abc2news.com/lifestyle/chesapeake-bay/trash-clean-up-highlights-depth-of-chesapeake-bays-pollution-problem">http://www.abc2news.com/lifestyle/chesapeake-bay/trash-clean-up-highlights-depth-of-chesapeake-bays-pollution-problem</a>	Trash cleanup highlights depth of Chesapeake Bay's pollution problem
7/24/14	Green Hero	<a href="http://www.greenhero.com/index.php?route=extras/blog/getblog&amp;blog_id=265">http://www.greenhero.com/index.php?route=extras/blog/getblog&amp;blog_id=265</a>	Solar-powered water wheel, processing floating garbage!