

Development & Implementation of Marine Debris Reduction Strategies

Final Report for FY21, Task 93 Grant



Photo of debris in Little Hunting Creek, Fairfax, Virginia by Zach Huntington, CVW

Submitted to the Virginia Coastal Zone Management Program by
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Grant Period: October 2021 – September 2022 (with an extension to March 30, 2023)



Of Longwood University



The Virginia Coastal Zone Management Program is a network of state agencies and coastal localities. The Virginia Department of Environmental Quality serves as the lead agency for the network.

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ABOUT VIRGINIA COASTAL ZONE MANAGEMENT PROGRAM

Established in 1986, the Virginia CZM Program is a network of state agencies and coastal localities that administer laws, regulations and policies to protect coastal resources and foster sustainable development. The Virginia Department of Environmental Quality serves as lead agency of the network. The Program is funded by the National Oceanic and Atmospheric Administration.

ABOUT CLEAN VIRGINIA WATERWAYS

Clean Virginia Waterways of Longwood University is a statewide organization dedicated to decreasing plastic pollution, litter, and marine debris through research, cleanup events, and building collaborations. Since 1995, more than 120,000 volunteers have removed 5 million pounds of debris from Virginia's rivers and beaches during CVW's annual cleanups that are held in September and October. CVW is funded through grants, gifts, sponsorships, and workshop fees.

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The views expressed herein are those of the authors and do not necessarily reflect the views of the U.S. Department of Commerce, NOAA, or any of its subagencies.

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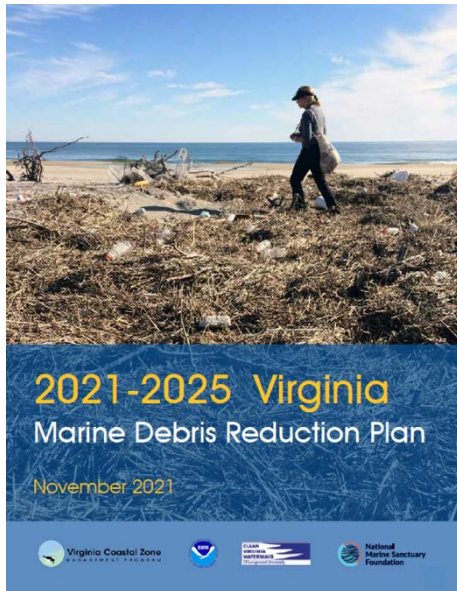
Project period: This grant started on October 1, 2021, and originally, was to end on September 30, 2022. It was extended to March 30, 2023 so CVW and CZM could use the final funds in the grant to host a CBSM Workshop on Feb 27-28 and March 1, 2023.

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PROJECT SUMMARY

This task supported the Virginia Coastal Zone Management (CZM) Program's commitment to provide leadership in reducing the amount of trash and marine debris from land-based and water-based sources in Virginia and the Mid-Atlantic region. This grant from the Virginia CZM Program to Clean Virginia Waterways (CVW) of Longwood University supported various projects that furthered the implementation of the 2021-2025 Virginia Marine Debris Reduction Plan (funded under previous CZM grants.)



The VMDRP, serves as a roadmap and common framework for nonprofit organizations, local governments, state agencies, regional partners, researchers, and industry as they work together on sustained approaches to reducing the flow of plastic trash and other trash items into our coastal waters. This robust collaboration will lead to cleaner and healthier coastal waters and oceans.

The VMDRP includes 60 strategic and definitive actions to reduce debris in Virginia's coastal waterways and the Atlantic Ocean. The actions are grouped under four main Goals:

1. Consumer Debris (mainly single-use plastics) (22 Actions)
2. Derelict Fishing Gear (17 Actions)
3. Microplastics & microfibers (13 Actions)
4. Abandoned & Derelict Vessels (8 Actions)

Under each Goal, there are five Strategies, which are cross-cutting methods for achieving goals.

- Prevention, Behavior Change, Education and Outreach
- Research and Monitoring
- Proper Disposal, Interception and Infrastructure

- Removal
- Policy, Management, Legislation and Enforcement

Of the 60 Actions in the plan, 22 of them can be found under “Prevention, Behavior Change, Education and Outreach,” reflecting the consensus of the stakeholders who felt that prevention of litter and waste through behavior change is key to reducing marine debris from specific sources such as balloons, single-use plastic bags, food and beverage items, and cigarette butts.

The 2021-2025 Virginia Marine Debris Reduction Plan can be downloaded from the [Virginia CZM Program website \(https://www.deq.virginia.gov/our-programs/coastal-zone-management/coastal-conservation/marine-debris\)](https://www.deq.virginia.gov/our-programs/coastal-zone-management/coastal-conservation/marine-debris) or from the [Clean Virginia Waterways’ publication page \(http://www.longwood.edu/cleanva/publications.html\)](http://www.longwood.edu/cleanva/publications.html)

Development of Local Policies and Implementation of VMDRP Goals (Product #1)

During this grant period, progress was made on implementing many aspects of the Virginia Marine Debris Reduction Plan through work described below. Under direction of the Virginia Coastal Zone Management (CZM) Program, Clean Virginia Waterways (CVW) fostered collaboration between agencies, local governments, researchers, manufacturers and businesses, non-profits, citizens, and stakeholders in Virginia as well as other mid-Atlantic states.

Product #1 for this grant was to develop detailed strategies for policy development based on the 2021-2025 VMDRP.

Originally, it was anticipated that recommendations from the Virginia Plastic Waste Prevention Advisory Council (**PWPAC**) would include development of policies to decrease plastic pollution, and that CVW would assist in implementing those recommendations. But the council's recommendations (issued October 2021 and December 2022) focused on these areas: A) having DEQ collect data on several aspects of solid waste management and also about implementation of the plastic bag tax, and phase out of expanded polystyrene; B) increased education and outreach, and C) Building capacity within the state government *"...to focus on recycling, litter, and circular economy systems that supports and sustains data collection, materials marketplaces, and other technical assistance."* See Appendix A for the complete recommendations from the PWPAC. Final recommendations from the council are expected in June 2023. At that time, CVW staff will assess which recommendations it can assist with implementing.

- Background on the **PWPAC**: A law (HB 1354) in 2020 mandated the creation of the PWPAC. The PWPAC was to "...study and make recommendations regarding plastic pollution problems in the Commonwealth, with the mission of eliminating plastic waste and contributing to the achievement of plastics packaging circular economy industry standards." The Council was not convened until June 2021, and as of May 2023 has not issued any recommendations related to public policies that would lead to decreased plastic pollution.

Another goal of this grant was to provide information to increase public awareness and facilitate data-based policy decisions to reduce plastic pollution and marine debris. This included downloadable targeted reports (informed by the Actions in the VMDRP and the 309 5-year strategy), a statewide public perception survey of Virginia voters, webinars, a Marine Debris Summit, training in Community-Based Social Marketing (CBSM), media outreach, and extensive collaboration with partners in Virginia and other Mid-Atlantic states. All are described later in this report.

Policy makers will be able to utilize the reports and public perception survey to develop

recommendations without having to expend resources on their own that are often a barrier to access for small, rural, economically disadvantaged communities. Individuals or organizations in the positions to influence change often lack access to the most relevant or recent data and these reports will provide necessary information for informed decision making. Data and reports were shared widely with CVW’s network of academic and nonprofit institutions throughout the state through multiple platforms, including social media. The reports are a valuable asset to quickly provide detailed information to interested parties and help increase awareness and understanding of marine debris and plastic pollution challenges and opportunities for improvement.

Single-use Plastic Bags

In 2020, legislation ([SB 11](#)) passed in Virginia allowing counties and cities to impose a five-cent fee (tax) on plastic bags provided to consumers by certain retailers. At first, adoption of the fee was slow as Virginia’s counties and independent cities cited the need for facts and data about the plastic bag problem in Virginia, as well as model legislation, and assistance in developing community support for a fee. CVW assisted local policy makers as they considered policies that will support waste minimization of the most common and harmful items found as marine debris – including plastic bags.

As of May 2023, the following localities have fees on disposable plastic bags:

1. Alexandria City
2. Arlington County
3. Fairfax County
4. Falls Church City
5. Fredericksburg City
6. Loudoun County
7. Roanoke City
8. Albemarle County (began January 1, 2023)
9. Charlottesville City (began January 1, 2023)
10. Fairfax City (began January 1, 2023)

Source: <https://www.tax.virginia.gov/disposable-plastic-bag-tax>

During this grant period, CVW provided data about the prevalence of litter from single-use plastic bags to several local governments as they considered implementing a fee, and assisted various groups as they developed local campaigns to advocate for the fees. Specifically, CVW provided data (from the International Coastal Cleanup) and guidance to Henrico, Fairfax, Norfolk, Virginia Beach, Charlottesville, Stafford, City of Richmond, and other communities as they consider fees on plastic bags. CVW also created and updated the “Single-use Plastic Bags: Common Litter in Virginia” webpage: <http://www.longwood.edu/cleanva/bags.html>

- And a [spreadsheet that shows actions](#) being taken by local governments and links to ordinance language.

Lessons learned:

- One citizen group approached their county board of supervisors quickly without building adequate support amongst the supervisors prior to the vote. When the vote came up, concerns about equity caused the supervisors to vote against the fee. In other communities, the question of equity was addressed thoroughly prior to the vote being taken.
- In an interview with Roanoke, which was the first Virginia community to implement the five-cent fee, county employees stated that revenue from the fee is, if anything, disproportionately supporting lower income neighborhoods in their community. In addition to spending funds on liver prevention, litter cleanups, and increased infrastructure for solid waste, Roanoke is also spending the bag fee revenue on other environmental projects including planting more trees.
- A partnership of NGOs in Virginia Beach has worked for more than a year to address equity questions partly through extensive distribution of reusable shopping bags. Some of the reusable shopping bags were sewn from donated fabric by volunteers, others were newly purchased, while other bags were contributed to the program by people who have a surplus of reusable shopping bags. The partnership also handed out stickers, fact sheets, and created this web page to advocate for the bag fee in Virginia Beach:
 - For more on the Virginia Beach effort, view <https://www.lynnhavenrivernow.org/blog/why-a-plastic-bag-fee-makes-good-sense-for-virginia-beach/>
- It is important for citizens and policy makers to understand that revenues from the bag fees stay in the communities where they were raised. Some of the objections made by local supervisors were based on incorrect assumptions that the revenue from the fee was "...just another tax going to the state government." It is equally important to let people know that the revenue is to be spent on environmentally-focused projects including cleaning up communities, infrastructure to prevent litter, and other environmental priorities as determined by the local government.



Virginia's Litter Tax

CVW continued to engage with nonprofits, including Clean Fairfax, LitterFreeVA.org, Virginia Conservation Network, Lynnhaven River NOW, and the Virginia Sierra Club, to review the status of the Virginia Litter Tax which was increased in 2020 for the first time in more than 40 years. In 1980, the Virginia legislature set the annual litter tax at \$10 for manufacturers, wholesalers, distributors and retailers of consumer products, and \$15 for each location where groceries, soft drinks, and beer are sold. With [HB 1154](#), the Virginia General Assembly voted to raise the annual Virginia litter tax for the first time in 43 years from \$10 to \$15 and the additional annual litter tax from \$15 to \$30. Both taxes are imposed on manufacturers, wholesalers, distributors, and retailers of certain

products, however, the additional tax applies to fewer businesses. According to CVW's research, the tax would be \$37 and \$73 (CPI inflation calculator, n.d.) annually per business if it had been indexed to inflation.

Releasing Helium-filled Balloons

CVW continues to educate people about Virginia's law that bans the releasing of helium-filled balloons. As of July 1, 2021, a new law ([HB 2159](#)) "Prohibits any individual 16 years of age or older or other person, including a corporation, from intentionally releasing, discarding, or causing to be released or discarded any nonbiodegradable balloon outdoors". The bill provides that if a person under the age of 16 releases a balloon at the instruction of an adult, the adult shall be liable for the civil penalty.

Expanded Polystyrene (EPS)

CVW is working with local governments and Planning District Commissions to raise awareness about the upcoming phase out the use of expanded polystyrene (EPS) food service containers. The Virginia General Assembly passed this phase out with bill [HB 533](#) in 2020, and passed again during the 2021 session ([HB 1902](#)) in order to become law. The law prohibits the dispensing of food prepared by a vendor to a customer in a single-use expanded polystyrene food service container. As the law was originally passed, chain restaurants were to be required to stop using such containers by July 1, 2023, and all other food vendors had to discontinue use by July 1, 2025. A five-year extension was added to the phase-out schedule during budget negotiations and without a vote.

Resources for Legislators & Policy Makers

CVW was a lead author of the plastic pollution chapter in the Virginia Conservation Network's annual briefing book for legislators, calling for extended producer responsibility, implementation of a bottle bill, an increase in the Virginia litter tax, and a possible statewide ban or user fees on plastic bags. In addition, a recommendation was made to open the Virginia Litter Fund to nonprofit organizations (which organize most of Virginia's litter cleanups and public outreach campaigns) and to universities doing research on issues related to recycling and litter prevention.

In addition, CVW provided extensive information about the sources and impacts of litter and marine debris to legislators and their staffs as well as on the [LitterFreeVA.org](#) website, which is a collaborative effort to increase communication about legislative solutions to litter and marine debris.

Public Perception Survey: Virginia Voters' Attitudes and Support for Public Policies to Reduce Plastic Pollution (Product #2)

Background: CVW and CZM staff completed a statewide public perception survey by engaging OpinionWorks LLC. OpinionWorks has provided valuable and professional services on several previous social marketing campaigns implemented by CVW, Virginia CZM Program, MACO and the Mid-Atlantic Marine Debris Work Group.

This statewide survey of 900+ voters measured their attitudes on several aspects of plastic pollution **including their support for public policy** initiatives that might be considered in Virginia. The statistically significant representative survey also tested words and messages that are key to outreach efforts, and identified trusted messengers. The survey was sent out in March 2022 and was partly funded by this grant as well as the FY20, Section 309 grant to CVW. This survey meets one of the ten "Near-Term Action Items" of the **2021-2025 Virginia Marine Debris Reduction Plan** (downloadable from the [Virginia CZM Program](#) or [Clean Virginia Waterways](#)). The survey was followed by 10 one-on-one in-depth interviews conducted virtually to better understand the reactions to the words and messages, and to help refine messaging.

The survey was designed to give high confidence in the reliability of the results, and to reach a very good cross-section of the public, including hard-to-reach segments like people who are telephone-averse, those who are younger and more mobile, low-income people, people of color, and people who are digitally disconnected. The sample size was large enough to provide a statewide result within $\pm 3.5\%$ at the 95% confidence level, and allowed breakouts for demographic subgroups and the major regions of the Commonwealth. The survey results also provide a baseline to help determine effectiveness of management efforts.

Because all research that involves human subjects requires approval, CVW staff obtained approval of the survey and interview instruments from the Longwood University Institutional Review Board prior to starting the survey.

Results:

The research reveals a Virginia public that is deeply concerned about plastic pollution, worried about the impact of plastic on aquatic life, and concerned about the prevalence of microplastics making their way into the food supply. The study shows broad support for various public policy measures designed to reduce plastic pollution.

Policies to Reduce Plastic Pollution	Supported by Virginia Voters
Require less plastic in packaging	76% of voters
Shift the costs of recycling programs off of community taxpayers and onto producers	71% of voters
Deposits on beverage bottles and cans	65% of voters
Cigarette litter fee	64% of voters
Ban single-use plastic bags	63% of voters
Ban single-use plastic grocery and shopping bags	61% of voters

Testing terminology, we learned that “plastic ocean pollution” and “plastic pollution” are much more evocative than “marine debris”. During the in-depth interviews, participants revealed that they did not know that plastic is typically made from petrochemicals. Finding that out was surprising and disturbing to them, raising health, climate, and scarcity concerns all at once. The study also asked voters about their consumption of bottled water. The study shows that poor ratings of tap water are driving increased bottled water consumption. In addition to issues of health and safety, tap water *taste* appears to be driving bottled water demand.

The voters were also asked about their level of trust for various organizations. State agencies emerged as very trusted as did the Virginia Aquarium and Marine Science Center.

Regional breakdowns show how voters in several regions feel about public policies that would reduce marine debris. Below is one example, focused on a polystyrene ban. See the 28-page summary report (or the full 285-page report) for other regional breakdowns.

The Piedmont and Mountain regions of Virginia join Northern Virginia, Hampton Roads, and the rural Tidewater in posting support numbers for a polystyrene ban well above 60%.

Ban Polystyrene Containers

	Northern Virginia	Richmond Area	Hampton Roads	Rural Tidewater	Southside	Piedmont/Mountain
Favor	67%	56%	67%	68%	51%	62%
Oppose	12%	15%	12%	17%	26%	17%
Neutral/Not sure	21%	29%	21%	15%	23%	21%

Products: In September, an 8-page summary of the key findings was sent to media with a press release, and findings were shared at the Virginia Marine Debris Summit and other venues. A PowerPoint deck of slides was also prepared and shared with partnering organizations.

A 28-page summary report provides more a detailed breakdown of the data, including regional analyses. Finally, a complete report (285 pages) includes all the raw data from the survey.

See Appendix B for the 8-page summary of the Survey, and Appendix C for the 28-page report. The full survey report (285 pages) can be downloaded from CVW's publication page: <http://www.longwood.edu/cleanva/publications.html>

Marine Debris Reduction in Virginia and the Mid-Atlantic (Product #3)

In close collaboration with Virginia CZM program staff, CVW undertook the following projects to reduce marine debris in Virginia in the mid-Atlantic.

A. Abandoned and Derelict Vessel Work Group

A major undertaking during this grant year further addressed a pressing and growing marine debris problem in Virginia: boats that are abandoned in the marine environment causing many environmental, economic and human safety (navigational) impacts. Addressing abandoned and derelict vessels (ADV) was included in the 2014 Virginia Marine Debris Reduction Plan, and elevated to a major goal in the updated VMDRP for 2021-2025.

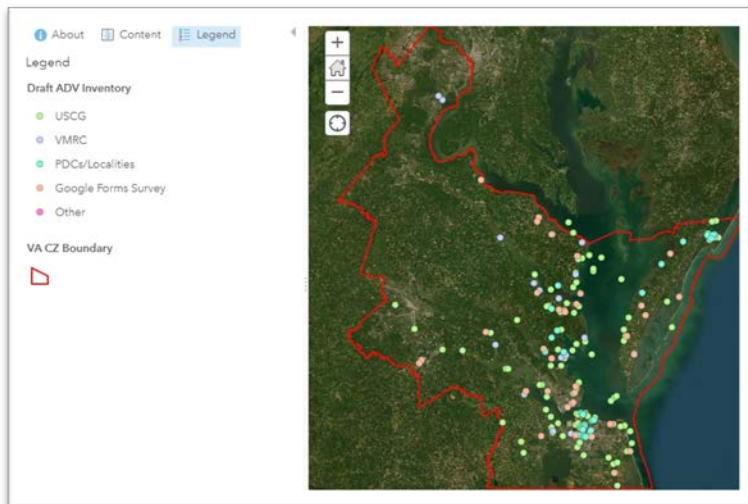
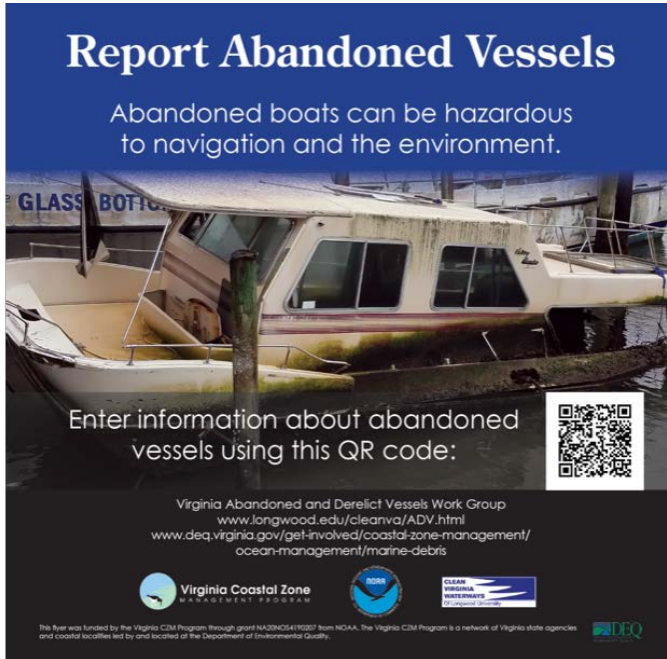
CVW & CZM staff created and co-administered the Virginia ADV Work Group (created under the previous FY20 Grant), and started meetings of the group in January 2020. The work group engaged the VIRGINIA Dept of Wildlife Resources, Virginia Marine Resources Commission, US Navy, US Coast Guard, local governments, law enforcement, marinas, and other key partners. The work group and its subcommittees focused on prevention, removal, and disposal options for ADV.

Products: CVW worked closely with Jeff Flood of Virginia CZM to write and publish a full report from the ADV Work Group, a 4-page highlight document, and a press release. See Appendix D. Several media outlets ran the story including [the Bay Journal](#). Staff contributed to the Virginia Coastal Policy Center's policy paper (published March 2022) which reviews current ADV-related laws in Virginia and other states. More about this collaborative effort to address ADVs can be found on the [Virginia ADV Work Group webpage](#), maintained by CVW.

Results:

Fiberglass disposal options: CVW & CZM engaged stakeholders including Titan America (the only cement manufacturer in VA) to explore possible use of fiberglass as an alternative energy source for cement manufacturing.

ADV Inventory: CVW printed and distributed laminated posters to marinas and the US Coast Guard to alert boaters about the statewide inventory of ADV which is currently housed at the Virginia CZM, and the need for input from boaters. Data collected through this effort contribute to the mapping of ADV in Virginia, a project undertaken by CZM staff.



Above: This “Report Abandoned Vessels” poster was designed by CZM Program staff, and disseminated by CVW and the US Coast Guard to marinas and boat ramps throughout the state. Data about ADV from several sources (USCG, the Virginia Marine Resources Commission, planning district commissions, and the public) were mapped by CZM Program staff.

Prevention and public education:

CVW & CZM, with members of the prevention and public outreach subcommittee, coordinated with the Virginia Department of Wildlife Resources to increase communication with boat owners about their legal responsibilities for correct disposal of old boats.

CVW & CZM shared the results of the Virginia ADV Work Group during a [NOAA's Marine Debris Program ADV "Salvaging Solutions" webinar](#), with the US Coast Guard's Virginia Area Committee, and with other groups.

Capacity building: CVW & CZM staff contributed extensively to writing a proposal to the NOAA Marine Debris Program's Removal Grant that could provide \$2.9 million to remove approximately 100 ADV from Virginia's coastal waterways while also building capacity for starting a comprehensive ADV Prevention and Removal Program. In writing the grant proposal, staff collaborated with Lynnhaven River NOW, BoatUS, and the Virginia underwater archaeologist at the Department of Historic Resources. While the first proposal was not selected (due to lack of available funding), the proposal was later resubmitted and was recommended for funding by NOAA.

CVW & CZM staff produced an **educational video** about ADV issues in VA. The video can be viewed on CVW's YouTube Channel: <https://youtu.be/8Uwwe1R8Agk>

CVW learned that no **comprehensive list of marinas in Virginia** existed, so it created a list from several resources including the Virginia Department of Health, the Virginia Clean Marina Program, and a publisher of a marina guide.

B. Regional Solutions to Marine Debris: The Mid-Atlantic Marine Debris Work Group

Since marine debris is a transboundary problem across the Mid-Atlantic, CVW staff were engaged in monthly discussions of the Mid-Atlantic Regional Council on the Ocean's Marine Debris Work Group, which is led by the Virginia CZM Program Manager, Laura McKay. CVW staff were also involved in smaller task groups working on development of regional approaches to prevent or remove marine debris. Because of Virginia's earlier work in creating a marine debris reduction plan and creating a Community-Based Social Marketing (CBSM) campaign to address balloon litter, CVW and the Virginia CZM Program staff often provided guidance and background information to the Mid-Atlantic Marine Debris Work Group.

Specifically, the Virginia CZM Program and CVW contributed to the expansion of a CBSM campaign in Mid-Atlantic states to reduce the intentional release of helium-filled balloons. CVW and Virginia CZM Program staff assisted MARCO with many aspects of its grant from NOAA Marine Debris Program including development, printing, and shipping exhibit displays to more than 15 partnering organizations and local governments. This project involved close collaboration with three aquariums in the Mid-Atlantic.

CVW contributed to this NOAA-funded effort by working with Virginia CZM to research and co-write new fact sheets about the impact of foil balloons on power lines, and contributed to updating the PreventBalloonLitter.org website and postings on several Facebook pages that are related to the effort. CVW contributed to other Mid-A Marine Debris Work Group projects through input at monthly meetings, and continue to work closely with the NOAA Marine Debris Program staff to complete Actions in the Mid-Atlantic Marine Debris Action Plan. CVW sent a media release to 140 media outlets to encourage them to stop providing coverage to balloon releases

CVW also convened partners through the mid-Atlantic to discuss options for increasing recycling of boat shrink wrap. This concern has many economic challenges to overcome, but the large quantities of high-quality shrink wrap that is sent to landfills every spring is alarming.

C. Virginia Plastic Pollution Prevention Network

The [Virginia Plastic Pollution Prevention Network](#) (co-created by the Virginia CZM Program, CVW and Eco Maniac Company in 2020) fosters collaboration in implementing aspects of the Virginia Marine Debris Reduction Plan, through monthly eNewsletters and zoom-based monthly webinars. Topics include:

- legislative updates
- behavior change campaigns
- information about fees on single-use bags
- upcoming events
- new marine debris research and resources
- volunteer cleanup events
- grant and funding opportunities
- other marine debris topics



The VPPP Network's goal is to facilitate communication and increase collaboration among people and organizations working on all aspects of preventing or removing marine debris, litter, and single-use plastic items.

A total of 235 people participated in the 7 meetings held during this period. No meeting was held in September 2022 so members could attend the 2022 Virginia Marine Debris Summit in Virginia Beach.

D. Engaging the Stormwater Management Community on Land-Based Sources of Marine Debris



To build local governments' capacities to prevent land-based sources of litter and marine debris from entering waterways, CVW organized the 4th annual “**Stormwater + Litter Webinar**” held on December 7, 2022, (during the extension period) via zoom. A total of 136 stormwater and public utilities professionals from local governments, military bases, universities and businesses attended. Topics included a case study (decreasing bottled water use in a high school), status of the Virginia litter tax, and instream trash trap options. Post-webinar survey results were very positive. CVW staff also gathered ideas from the stormwater and litter prevention experts in attendance on other projects that would lead to measurable decreases in marine debris, and would be transferable. The workshop was coordinated by Clean Virginia Waterways of Longwood University with the assistance of Virginia Coastal Zone Management Program. View past workshop presentations on [CVW's Stormwater & Plastic Pollution website](#).

See Appendix E for the workshop agenda and lists of speakers and attendees.

E. Local Collaborations

Throughout this grant period, CVW staff assisted local governments as they sought solutions to land-based sources of marine debris. Much of this was focused on implementing a 5-cent fee on single-use plastic bags.

F. Outreach, Raising Awareness and Social Media

CVW staff spoke about plastic pollution and the Virginia Marine Debris Reduction Plan to school groups, NGOs, media, the Chesapeake Bay Program Plastic Pollution Action Team (PPAT), Chesapeake Bay Commission, and others. CVW staff spoke at the EPA Trash Free Water Program's January 20, 2022 webinar, “[Outreach and Education for Trash Free Waters – What Makes a Successful Campaign?](#)” which drew over 230 attendees, and also spoke at a [NOAA Abandoned & Derelict Vessel webinar](#).

In addition, outreach activities included:

- Contributed to two General Assembly-initiated work groups (the Waste Diversion and Recycling Task Force and the Virginia Plastic Waste Prevention Advisory Council);
- Contributed to a briefing about marine debris and ADV for Virginia's Acting Secretary of Natural and Historic Resources;
- Communicated solutions to plastic pollution to the Northern Virginia Waste Management Board and others.

During these presentations, resources, data, and information about the VMDRP, Joyful Send-off, Community-Based Social Marketing campaigns, balloon monitoring, and mid-Atlantic regional planning on marine debris prevention were shared.

G. Sharing Data: Fact Sheets & Reports

CVW published factsheets during Virginia's General Assembly about preserving the litter tax nonpayment fee, the proposed expansion of plastics-to-fossil-fuel manufacturing facilities in Virginia, and the local regulation of material recovery facilities. These fact sheets were disseminated widely, being offered to the general public through multiple outlets including the Virginia Conservation Network and Litter Free Virginia.

H. Media & Social Media

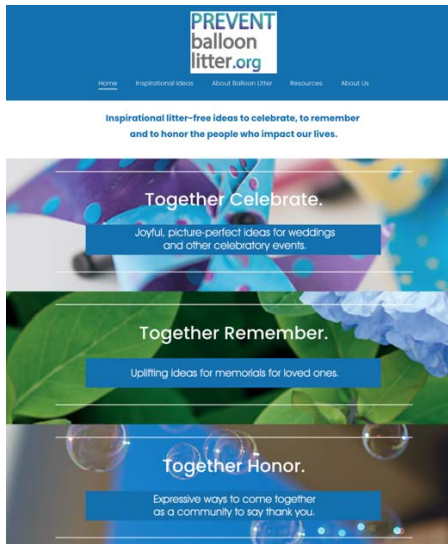
CVW staff was interviewed by reporters about marine debris, plastic pollution, microplastics, and PPE-related litter (gloves and masks).

Social Media

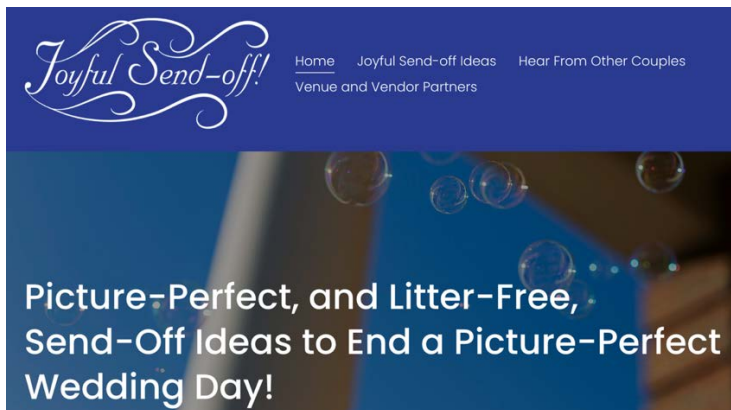
CVW maintained and contributed to several social media sites including **websites** ([CVW](#), [Virginia Plastic Pollution Prevention Network](#), [PreventBalloonLitter.org](#), and [JoyfulSendoff.org](#)), and **Facebook** pages ([CVW](#), [Virginia Plastic Pollution Prevention Network](#), [Keep it Beachy Clean](#), [PreventBalloonLitter.org](#), and [JoyfulSendoff.org](#)). CVW staff also continuously updated a spreadsheet showing local adoption of bag fees on <http://www.longwood.edu/cleanva/bags.html> and on [LitterFreeVA.org](#).

This grant allowed for the continued hosting and upkeep of two web sites: JoyfulSendoff.org and PreventBalloonLitter.org. Organizations from around the world are partners on the PreventBalloonLitter.org website. The website is also serving as a resource for the Mid-Atlantic states' campaign to reduce the intentional releasing of helium-filled balloons.

CVW and Virginia CZM staff continued to maintain the Facebook pages for Joyful Send-off and Prevent Balloon Litter by adding posts to encourage litter free ideas for celebrations.



The PreventBalloonLitter.org website, designed by Virginia CZM Program’s Virginia Witmer, and written by Katie Register (CVW) and Virginia Witmer, offers inspirational litter-free ideas for people to celebrate, remember or honor the people who impact their lives.



The JoyfulSendoff.org website, designed by Virginia CZM Program’s Virginia Witmer, and written by Katie Register (CVW) and Virginia Witmer, offers inspirational litter-free ideas for weddings and other “happy event” celebrations.

Videos

Under previous grants, CVW and the Virginia CZM Program co-produced four animated videos that show the impacts that balloon litter has on the environment, wildlife, and power outages. The videos also feature litter-free ideas on ways to celebrate without releasing balloons. Meetings of the Virginia ADV Work Group are also available for viewing. Below is a chart showing the number of times these videos have been viewed as of April 2023.

All videos are available on CVW’s YouTube Channel.

<https://www.youtube.com/c/CleanVirginiaWaterwaysofLongwoodUniversity>

Name of Video	Views
Balloons as Litter – in English	313,000+
Balloons as Litter – in Spanish	10,000+
How to use GPS unit for measuring distances	38,000+
Balloons as Litter (produced by ATTN: and featuring CVW’s and CZM’s research)	2,700,000




These stills from the “Alternatives to Balloon Releases” videos show that balloon litter can impact wildlife on land...and in the ocean. The videos are available in English and Spanish.


GPS Instructional Video

Under the FY17 grant from the Virginia CZM Program, CVW created an instructional video for Mid-Atlantic partners on how to use the GPS units that were provided to them through a Virginia CZM Program grant. Amazingly, this video has been viewed more than 38,000 times.

How to measure distance between two points, and to measure distance as you walk. Using Garmin e-trex 20x





A video by



Of Longwood University

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OTHER

CVW received 5 monofilament recycling bins from the NOAA Greater Atlantic Regional Fisheries Office (GARFO) and distributed these to piers in Virginia Beach in the fall of 2022.

2022 Virginia Marine Debris Summit (Product #4)

Working closely with Virginia CZM, CVW planned and executed a two-day Summit focused on consumer debris items (bags, beverage- and food-related packaging, cigarette butts, balloons, etc.) and solutions (behavior change, public policy and outreach). Held on Sept 27 & 28, 2022 at the Virginia Aquarium in Virginia Beach, a total of 117 people registered, and 101 attended the Summit which was held at the Virginia Aquarium in Virginia Beach. Field trips included tours of the aquarium's new stranding center, the soon-to-be-opened South Building (which includes a marine debris display), and marine debris monitoring field methodologies (led by NOAA Marine Debris Program and CVW staff). Many of the attendees also visited the NOAA/CZM-funded newly-installed marine debris educational kiosk located on the boardwalk in Virginia Beach.

Like the previous Virginia Marine Debris Summits (supported by FY11 and FY15 grants), and the 2019 Mid-Atlantic Marine Debris Summit (supported by the FY18 grant), the 2022 Summit was a valuable forum for the marine debris and litter prevention communities to exchange research outcomes, build collaborations, and generate new ideas.

The planning committee comprised of CZM staff and representatives from Virginia Aquarium, Clean Virginia Waterways, VIMS, and DEQ. The summit brought together marine debris experts, state and local resource managers, community educators, and potential funding sources to review the accomplishments of the Virginia Marine Debris Reduction Plan, share ongoing research, explore emerging issues and identify additional priorities. Representatives from Virginia, other MARCO states, and DC attended in order to stimulate continued regional approaches to marine debris sources, impacts, and mitigation. See Appendix F for the Summit agenda and registration list.

Balloon Debris Monitoring (Product #5)

During this grant period, surveys were conducted on Fisherman Island National Wildlife Refuge on November 17th, 2021, February 9th, 2022, and August 12th, 2022. This site was selected as Virginia's main monitoring site to track marine debris deposition over time as part of the NOAA Marine Debris Programs' grant to MARCO.

November survey: On November 17th, 2021, the survey revealed 171 pieces of balloon-related debris which represented 15.7% of all debris items (N=1087). Balloon-related litter was the most frequently found type of litter for this survey, followed by plastic beverage bottles (n=98) and clam nets (n=85). There was also a high prevalence of foam pieces (n=269) and hard plastic pieces (n=29), but because these fragments could come from a variety of sources such as foam cups, coolers, buoys, etc., these numbers are not included in the ranking of identifiable marine debris.

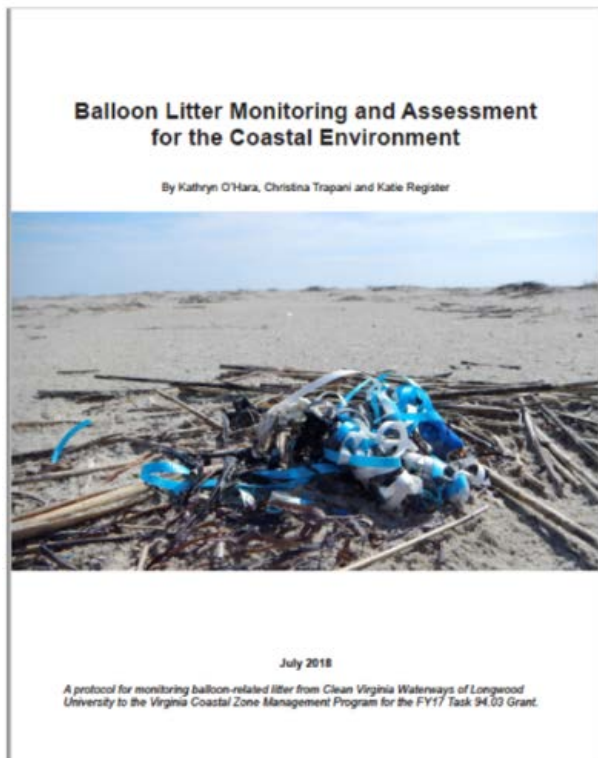
February survey: On February 9th, 2022, a total of 109 pieces of balloon-related debris were recorded, which represented 7.4% of all debris items (n=1475). Balloon-related litter was the most frequently found type of debris, closely followed by plastic beverage bottles (n=105). A high prevalence of foam pieces (n=511) and hard plastic pieces (n=86) was recorded during this survey, but were not included in rankings due to the uncertainty surrounding the source from which the pieces originated.

August survey: A survey on August 12th, 2022, found 120 balloon-related pieces of litter, representing 10.9% of all debris. For this survey, balloons were the second most frequently found type of debris, behind plastic bottles (n=164). There was a high prevalence of foam pieces (n=228) and hard plastic pieces (n=110) recorded during this survey, but due to the uncertainty of the source of these fragments mentioned above, foam pieces were not included in marine debris rankings.

Researchers Christina Trapani and Kathy O'Hara were sub-contracted by CVW to conduct monitoring of balloon litter on Fisherman Island National Wildlife Refuge to better understand the abundance, distribution, accumulation, and fate of balloon litter in coastal environments of Virginia. All permits were obtained prior to the surveys. No monitoring was done on FINWR during predator removal work and during the period of nesting of protected birds. These monitoring events included 9 volunteers for a total of 60 volunteer hours.

In order to standardize monitoring and assessment of balloon-related litter, CVW used the *Balloon Litter Monitoring and Assessment for the Coastal Environment* protocol that was developed in 2018 (FY18, Task 94.03) (O'Hara, Trapani and Register, 2018). These protocols enhance the ability to determine where balloon litter is most prevalent in specific coastal areas and provide a basis for monitoring and assessment of balloon litter on a regional, national, or international level. This protocol is used by the Mid-Atlantic states as grant partners monitor balloon litter on their beaches, and can be

downloaded from the CVW Publications page:
<http://www.longwood.edu/cleanva/publications.html>



This protocol allows groups to monitor balloon litter in coastal environments and create comparable data.

Highlights from this Year of Monitoring

Similar to previous years, balloon-related litter items (n=400) were the most commonly found type of debris for the three surveys combined. The rest of the top-ten list includes plastic bottles (n=367), clam nets (n=252), rope pieces (185), construction materials (n=142), glass bottles (n=121), buoys (n=100), plastic bottle caps (n=74), food wrappers (n=74), and hard plastic food containers (n=60).

Table: Data aggregated from three surveys on Fisherman Island National Wildlife Refuge show balloon-related litter (balloons, ribbons, and attachments) were the most commonly found type of debris, followed by bottles, clam nets, and rope pieces.

Rank	Item	Number
1	Balloon-related items	400
2	Bottles, plastic	367
3	Clam nets	252
4	Rope pieces	185
5	Construction materials	142
6	Bottles, glass	121
7	Buoys, floats	100
8	Bottle caps (plastic + metal)	75
9	Food wrappers	74
10	Cups & plates (plastic + foam + paper)	66

Table: Data from the three surveys show that balloon-related debris was 7.4% to 15.7% of all debris items found

Survey Date	Balloon-related debris items	Other debris items	All items	Percent of all debris that was balloon-related
11/17/2021	171	916	1,087	15.7%
2/9/2022	109	1,366	1,475	7.4%
8/12/2022	120	984	1,104	10.9%
TOTALS	400	3,266	3,666	10.9%

All Balloon-related Litter

For each balloon litter item recorded, specific information was obtained on the type (latex, foil, weather balloon) and quantity. Data were also collected about ribbons and other attachments. The 400 balloon-related litter items from these three surveys included 66 latex balloons, 74 foil balloons, 167 plastic ribbons, and 92 attachments such as plastic disks, pieces of tape, and clips used to tie-off balloons and attach plastic ribbons. One weather balloon was recorded during this study period and no sky lanterns were found.

Balloon-related debris items found on FINWR:

Latex Balloons	66
Foil Balloons	74
Ribbons	167
Attachments	92
Weather balloon	1
Total	400

Composition of Balloon Litter

Of the balloon-related litter, 41.8% was made up of plastic ribbons (n=167), 35.3% was made up of balloons (n=141), and the remaining 22.9% was made up of other attachments (n=92). Foil balloons (n=74) comprised 18.5% and latex balloons (n=66) were 16.5% of all balloon related debris.

Composition of Balloon Litter

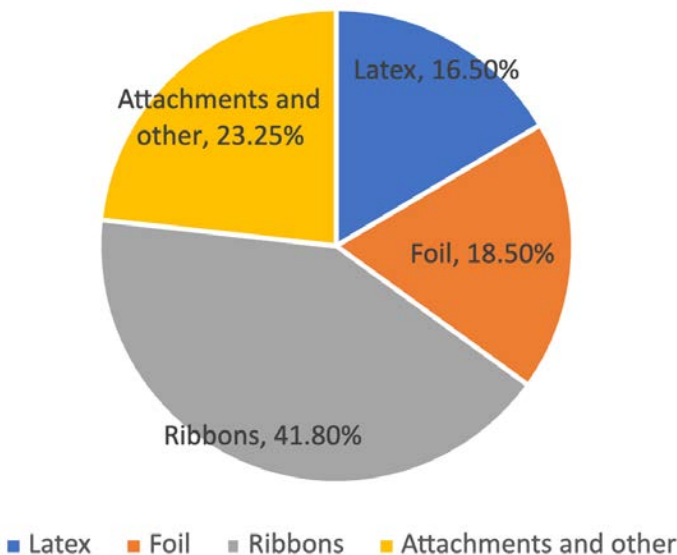


Chart: Plastic ribbons accounted for 41.75% of the balloon-related litter on Fisherman Island.

Latex vs. Foil Balloons

Similar to last year’s monitoring, latex balloons (n=66) were outnumbered by foil balloons (n=74). Foil balloons comprised 52.5% of the total balloons, and latex balloons were 46.8%. The single weather balloon accounted for the remaining 0.71%. The higher prevalence of foil balloons recorded during this grant period diverges from findings of the previous five-year study where latex balloons were found to be more abundant than foil balloons.

Plastic Ribbons and Other Balloon Attachments

At least 167 plastic ribbons were collected during this study period. This count is conservative since multiple plastic ribbons entangled in a bunch could not be accurately counted in the field. In these cases, ribbon bunches were recorded as one unless distinct colors were noted. Therefore, while the plastic ribbon count was large, it is also an underestimate of true amounts.

A total of 92 attachments, including plastic disks and tape used to attach the plastic ribbon to the balloon, were found during the surveys.

Event and Greeting Messages

Both foil and latex balloons can be purchased with pre-printed messages indicating specific events and greetings such as “Happy Birthday,” “Congratulations,” and “I Love You.” During this study period special event balloons included:

- Happy Birthday (n=3)
- Happy Valentine’s Day (n=2)
- Mother’s Day (n=1)
- Father’s Day (n=1)
- Congratulations (n=1)

Happy Birthday balloons were also the most common type of pre-printed balloon litter in the previous year’s monitoring (2020-2021).

Shoreline Location of Balloon Litter

The location of all balloon debris was recorded according to the beach profiles: “low” (in the swash zone), “mid” (between the high tide line and the beach face), and “high” (between the high tide line and the dune vegetation).

When aggregating data from these three surveys, we found that 53.5% (n=214) of balloon related litter were found above the high tide line and 14.5% (n=58) were found mid-beach. Only 1.3% (n=5) of balloon litter were found low on the beach. There was a decrease in the amount of litter found high on the beach in comparison to last year’s survey results, where 72.4% of litter was located above the high tide line.

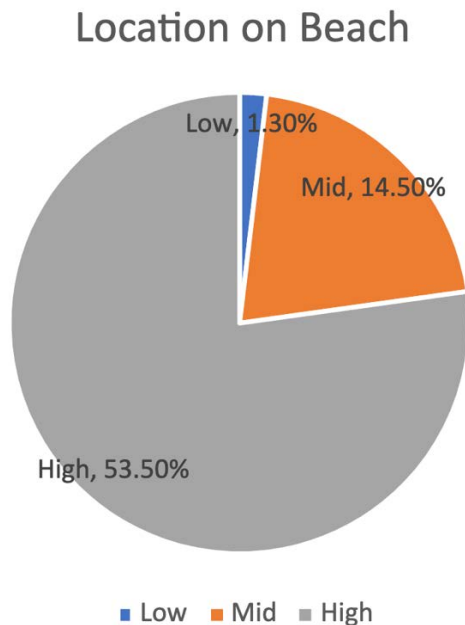


Chart: Most of the balloon-related litter items were found above the high tide line.

It is assumed that winds eventually blow lighter weight marine debris items, including balloons and plastic ribbons, toward the highest portion of the beach where it becomes trapped by dune vegetation. As this area is critical for nesting birds, diamondback terrapins, and sea turtles, balloon-litter concentrated here may pose an increased threat of entanglement or ingestion.

Comparing to Earlier Research

The large amount of balloon-related litter recorded on Fisherman Island National Wildlife Refuge during this grant period is similar to earlier research findings that the remote beaches and barrier islands of Virginia are “hot spots” for the accumulation of balloon-related debris. Balloons and plastic ribbons continue to be of concern especially in areas designated for protecting wildlife.

The high prevalence of plastic ribbons found during this grant period is also a consistent finding from previous studies done by the Virginia Aquarium and Clean Virginia Waterways (Register, Trapani, Swingle, 2019).

During the past 5 years of monitoring on Fisherman Island National Wildlife Refuge, balloons and balloon-related litter has been within the top 5 most common types of marine debris recorded, indicating a high and continuous prevalence of balloon-related litter on Virginia’s remote beaches.

It is important to point out that it is impossible to determine where the helium-filled balloons started their journeys since balloons can travel hundreds of miles before bursting or deflating.

Clam Nets on Fisherman Island

Data aggregated from three surveys on Fisherman Island National Wildlife Refuge show clam nets totaled 252 pieces. Clam nets were the 3rd most commonly found type of debris in the monitoring site. In the previous grant year, clam nets were the fourth most commonly found type of debris. The presence of clam netting on Fisherman’s Island has been noted throughout the nine years of monitoring on the island.

Date of monitoring	Clam net pieces recorded
11/17/2021	85
2/9/2022	100
8/12/2022	67
Total	252

Community-Based Social Marketing Workshop (Project #6)

In November 2022, with permission from the Virginia CZM Program, unspent portions of this grant were moved to Contractual to support a three-day virtual Community-Based Social Marketing (CBSM) Workshop.

The CBSM workshop, taught by Dr. Doug McKenzie-Mohr, was offered to key partners of the Virginia Marine Debris Reduction Plan as well as CZM partners working on native plantings, living shorelines, wetland protection/restoration, flood preparedness, climate resilience, and stormwater runoff. The workshop was held on Feb 27, 28 and March 1 with 116 attendees. CVW staff did the promotion, registration, contracting with Dr. McKenzie-Mohr, and all pre- and post-workshop communications with attendees. The National Marine Sanctuary Foundation provided additional financial support for the workshop.

This workshop supported objectives within both the NOAA Marine Debris Program's Strategic Plan as well as Objectives within the Mid-Atlantic Marine Debris Action Plan and the Virginia Marine Debris Reduction Plan. By gaining insight into CBSM techniques, participants will be able to more skillfully implement prevention campaigns in their communities or target geographies. This workshop expanded the number of trained practitioners in CBSM techniques in Virginia and the Mid-Atlantic region, strengthening the ability of community organizations and individuals to implement long-lasting marine debris prevention campaigns.

See Appendix G for list of attendees.

References

- O'Hara, K., Trapani, C., & Register K. (2018). *Balloon Debris on Virginia's Barrier Islands: Results of Monitoring from 2013 through 2017*. Clean Virginia Waterways, Longwood University.
- Register, K., Trapani, C., Swingle, M. 2019. *Monitoring Marine Debris in Virginia's Coastal Zone*, Project Report: April 2014 through June 2018. NOAA CZM Grant NA16NOS4190171, Task 81. Virginia Aquarium & Marine Science Center Foundation Scientific Report 2019-03, Virginia Beach, VA, 80 pp.
- Trapani, C., O'Hara, K., & Register K. (2018). *Balloon Litter Monitoring and Assessment for the Coastal Environment*. Clean Virginia Waterways, Longwood University.

APPENDICES

Appendix A: Recommendations of the Virginia Plastic Waste Pollution Advisory Council

Appendix B: Public Perception Survey: Virginia Voters' Attitudes and Support for Public Policies to Reduce Plastic Pollution – 8-page summary

Appendix C: Public Perception Survey: Virginia Voters' Attitudes and Support for Public Policies to Reduce Plastic Pollution – FULL REPORT (28 Pages)

Appendix D: ADV Summary report and link to full report

Appendix E: Stormwater and Litter Workshop—Agenda and attendees

Appendix F: 2022 Virginia Marine Debris Summit agenda and registration list.

Appendix G: Community-Based Social Marketing Workshop attendee list