Virginia Marine Debris Reduction Plan Refinement

Final Report for FY20, Task 94.04 Grant

Submitted to the Virginia Coastal Zone Management Program by
Katie Register, Executive Director, Clean Virginia Waterways of Longwood University

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Grant Period: October 2020 – September 2021 (with an extension to December 31, 2021)

Virginia Coastal Zone MANAGEMENT PROGRAM

NOAA

CLEAN VIRGINIA WATERWAYS
Of Longwood University

DEQ 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.

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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Photo on cover: Researcher Kathy O'Hara conducting a marine debris survey on Fisherman Island National Wildlife Refuge. Photo by Christina Trapani.

This project, FY 2020 Task 94.03 was funded by the Virginia Coastal Zone Management Program led by the Virginia Department of Environmental Quality through Grant #NA20NOS4190207 (e.g., FY20 #NA20NOS4190207) of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, under the Coastal Zone Management Act of 1972, as amended.

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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 VA CZM Program to Clean Virginia Waterways (CVW) of Longwood University supported various projects that furthered the implementation of the 2014 Virginia Marine Debris Reduction Plan (funded under FY11 Task 95.03). In addition, this grant supported the creation of the 2021-2025 Virginia Marine Debris Reduction Plan.

The work on this grant was accomplished by CVW in close collaboration with the staff of the Virginia CZM Program, and stakeholders in Virginia as well as other mid-Atlantic states.

Funding for this grant: This grant was funded with $60,000.

Covid-19 impacts: Travel restrictions put in place due to Covid-19 resulted in a need to reallocate portions of the grant budget. Unspent funds in the Travel and Supplies budgets were shifted to the Contractual line item. This allowed Clean Virginia Waterways and CZM staff to work with OpinionWorks to develop a statewide survey of voters to determine their attitudes on plastic pollution. The survey is described in this report.

Marine Debris Reduction in Virginia (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 and citizens.

A. Abandoned and Derelict Vessel Work Group

A major undertaking during this grant year 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.

In late 2020, CVW and CZM staff did extensive research about ADV programs in other states and enlisted the VA Coastal Policy Center at the College of William & Mary to write a policy paper (published in March 2022).

CVW and the VA CZM Program created the Virginia ADV Work Group and provided leadership in initiating discussions with the US Navy, US Coast Guard, local governments, law enforcement, marinas, and other key partners so that the extent of the abandoned vessel problem could be better understood and addressed.

During this grant period, the VA ADV Work Group and its four subcommittees (Laws & Policies; Funding; Prevention & Public Education; Removal & Disposal) developed recommendations to create a comprehensive Virginia ADV Prevention and Removal Program to address the many environmental, economic and human safety (navigational) impacts of ADVs. All zoom meetings were recorded and placed on the CVW YouTube Channel where they have, collectively, been viewed more than 1000 times as of February 25, 2022. To learn more about this collaborative effort to address ADVs, visit the Virginia ADV Work Group webpage.

CVW and the VA CZM assisted Lynnhaven River Now on developing a pilot ADV removal program, and writing a full proposal to NOAA's Marine Debris Program Removal Grant to fund the pilot.

B. Virginia Plastic Pollution Prevention Network

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

- legislative updates
- information about fees on single-use bags
- upcoming events
- new marine debris research and resources
- 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 285 people participated in the 11 meetings held during this period (no meeting was held in July 2021 so members could attend the Mid-Atlantic Marine Debris Summit).

See Appendix I for a list of topics and speakers who participated in the VPPPN monthly webinars.

C. Keep it Beachy Clean

Keep It Beachy Clean, under the direction of Christina Trapani, continued to provide litter-prevention messaging on social media and volunteer cleanup event assistance throughout the year. Ms. Trapani engaged members of the hospitality industry by presenting at several meetings, and organizing several cleanups of litter in Virginia Beach and surrounding communities.

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

As part of efforts to build local governments' capacities to prevent land-based sources of marine debris from entering waterways, CVW and many partners organized the 4th annual **"Stormwater + Litter Workshop"** held on December 9, 2021 (during the extension period) via zoom. A total of 149 stormwater and public utilities professionals from local governments, military bases, universities and businesses registered for the workshop, with approximately 120 attending.

When the workshop was in-person in previous years, attendance was 50 to 67, so going online more than doubled the outreach.

Topics covered solutions to stormwater-borne litter including data collection protocols, public outreach campaigns, in-stream collection of debris, and preventing litter from entering storm drains. Legal and policy measures to reduce litter from single-use plastics were also discussed. The MS4 Permit writer for the VA Department of Environmental Quality presented an update on MS4 permits in Virginia.

Partners:
The workshop was coordinated by Clean Virginia Waterways of Longwood University with the following partners:

- Clean Virginia Waterways of Longwood University
- Virginia Coastal Zone Management Program
- Virginia Lakes and Watershed Association
- Alliance for the Chesapeake Bay
- Virginia Water Monitoring Council
- National Oceanic and Atmospheric Administration, Marine Debris Program

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

Intercepting litter before it enters stream is a core goal of the Virginia Marine Debris Reduction Plan since 60% to 80% of marine debris comes from inland sources including littering, mis-managed solid waste, uncovered trucks, balloon releases, illegal dumping, etc. There are growing concerns about the impacts of debris and plastic pollution in rivers, the ocean and coastal waters, along with increasing emphasis on stormwater management of litter and debris.

E. Local Collaborations

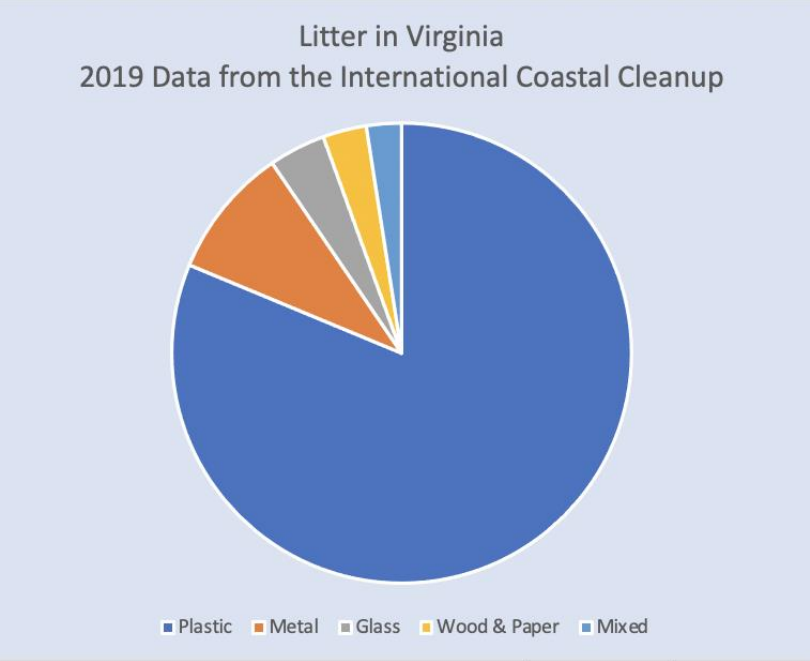
Throughout this grant period, CVW staff assisted local governments as they sought solutions to land-based sources of marine debris. Much of this was focused on implementing a 5-cent fee on single-use plastic bags.

F. Outreach and Raising Awareness

In the Virginia Marine Debris Reduction Plan, there are 22 Actions related to prevention, behavior change, education and outreach. During this grant year, CVW worked with partners across the state on these actions.

On June 20, 2021, CVW's executive director Katie Register published an editorial in the Richmond Times Dispatch entitled, "Virginia's Plastic Pollution Challenge." See Appendix III for the editorial.

CVW broadly shared data about the extent of plastic pollution in the state through presentations and social media postings that featured these graphics:


Litter in Virginia
2019 Data from the International Coastal Cleanup
Plastic
Metal
Glass
Wood & Paper
Mixed


Litter in Virginia
2019 Data from International Coastal Cleanup
GLASS
METAL
MIXED
PLASTIC
PLASTIC
Cigarette butts
Beverage Bottles
Bags, grocery
Food Wrappers/Containers
Caps & Lids
Cups & Plates
Bags, plastic other
Straws, Stirrers
Take out/away containers (plastic+foam)
METAL
Beverage Cans
Bottle caps, metal
GLASS
Glass bottles
MIXED
Building Materials
Balloons, diapers, tires, other

Sharing Data: Fact Sheets & Reports

CVW, with assistance from the VA CZM Program, published a report that compared bottle and can-related litter in Virginia as compared to states that have bottle bills, and another report that showed that balloon-related litter accumulates on Virginia's remote beaches.

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REPORT

Littered Bottles and Cans: Higher in Virginia Than in States with Bottle Bills

Summary

Clean Virginia Waterways of Longwood University found that plastic bottles, glass bottles, and aluminum cans are approximately two and half times more frequently littered in Virginia (a state without a bottle bill) than in states with bottle bills.

About Bottle Bills

In the 1970s, to combat litter and increase recycling, Oregon, Vermont, Michigan, Maine, Iowa, and Connecticut adopted container deposit bills, popularly known as "bottle bills." Later, Massachusetts, New York, California and Hawai'i also passed bottle bills.' Delaware had a bottle bill, but then replaced it with an alternative program. Bottle bills rely on deposits to incentivize consumers and retailers to participate in order to increase recycling, reduce energy use and greenhouse gas emissions, as well as decrease litter. Customers pay a deposit when they purchase a beverage, then return the empty bottle or can to redeem the deposits at the point of purchase or redemption center. States vary on the type of beverages that are covered and the amount of the deposits.[2]

This study compared 2019 International Coastal Cleanup (ICC) data between states with bottle bills with states that do not have bottle bills.

Bottles and Cans in Aggregate

In Virginia, a state without a bottle bill, bottles and cans accounted for nearly 22% of all litter recorded by volunteers in the 2019 ICC in Virginia. In contrast, in states with container deposit bills, bottles and cans accounted for 8.69%, on average, of the total debris recorded.

Plastic bottles

Plastic bottles accounted for 11.49% of all the litter recorded in the 2019 ICC in Virginia. In states with bottle bills, plastic bottles account for smaller percentages: from 1.99% to 8.27%. On average, states with bottle bills had 3.93% of the litter made up of plastic bottles, compared to 8.64% for the states that do not have a bottle bill.

Beverage Cans

Likewise, beverage cans are more frequently littered in states without bottle bills than in states with bottle bills according to 2019 ICC data. Bottle-bill states had anywhere from 0.79% to 5.47% of their litter made up of beverage cans – for an average of 2.51%. But in states with no bottle bills, cans accounted for 3.05% to 10.11% – for an average of 5.88% of the litter. In Virginia, beverage cans accounted for 6.66% of all recorded litter.

Glass Bottles

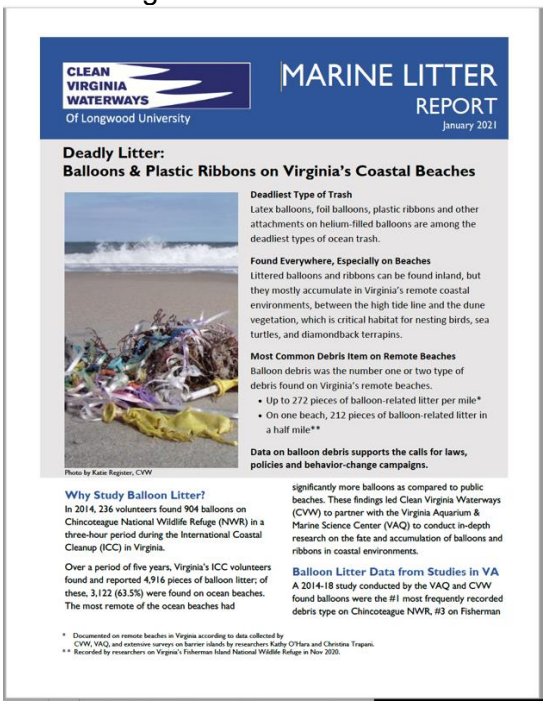
Glass bottles accounted for 3.73% of all the litter recorded in the 2019 ICC in Virginia. In states with bottle bills, glass bottles accounted for 2.25% of all littered items on average.

Rank of Bottles and Cans

Another way to see the difference in the frequency of littered items between states is to look at the Top Ten lists produced by ICC data. In states with bottle bills, bottles and cans consistently were found littered less frequently, and often were not in the Top Ten list. But in Virginia, plastic bottles, glass bottles and beverage cans were all in the Top Ten list of litter items in 2019. In fact, plastic bottles were the second most frequently-found type of litter in Virginia right after cigarette butts.

Top Ten Items, 2019 ICC in Virginia

1	Cigarette Butts	14.87%
2	Beverage Bottles (Plastic)	11.48%
3	Grocery Bags (Plastic)	10.38%
4	Food Wrappers (candy, chips, etc.)	10.20%
5	Beverage Cans	6.66%
6	Other Plastic Bags	5.36%
7	Bottle Caps (Plastic)	5.25%
8	Cups & plates (Plastic & foam)	4.41%
9	Beverage Bottles (Glass)	3.73%
10	Straws, Stirrers	3.23%



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MARINE LITTER REPORT
January 2021

Deadly Litter:
Balloons & Plastic Ribbons on Virginia's Coastal Beaches

Photo by Katie Register, CVW

Deadliest Type of Trash

Latex balloons, foil balloons, plastic ribbons and other attachments on helium-filled balloons are among the deadliest types of ocean trash.

Found Everywhere, Especially on Beaches

Littered balloons and ribbons can be found inland, but they mostly accumulate in Virginia's remote coastal environments, between the high tide line and the dune vegetation, which is critical habitat for nesting birds, sea turtles, and diamondback terrapins.

Most Common Debris Item on Remote Beaches

Balloon debris was the number one or two type of debris found on Virginia's remote beaches.

- Up to 272 pieces of balloon-related litter per mile*
- On one beach, 212 pieces of balloon-related litter in a half mile**

Data on balloon debris supports the calls for laws, policies and behavior-change campaigns.

Why Study Balloon Litter?

In 2014, 236 volunteers found 904 balloons on Chincoteague National Wildlife Refuge (NWR) in a three-hour period during the International Coastal Cleanup (ICC) in Virginia.

Over a period of five years, Virginia's ICC volunteers found and reported 4,916 pieces of balloon litter; of these, 3,122 (63.5%) were found on ocean beaches. The most remote of the ocean beaches had significantly more balloons as compared to public beaches. These findings led Clean Virginia Waterways (CVW) to partner with the Virginia Aquarium & Marine Science Center (VAQ) to conduct in-depth research on the fate and accumulation of balloons and ribbons in coastal environments.

Balloon Litter Data from Studies in VA

A 2014-18 study conducted by the VAQ and CVW found balloons were the #1 most frequently recorded debris type on Chincoteague NWR, #3 on Fisherman

* Documented on remote beaches in Virginia according to data collected by CVW, VAQ, and extensive surveys on barrier islands by researchers Kathy O'Hara and Christina Trapani.
** Recorded by researchers on Virginia's Fisherman Island National Wildlife Refuge in Nov 2020.

CVW & CZM staff also worked on additional fact sheets for PreventBalloonLitter.org.
CVW contributed to the Ocean Conservancy's report on pandemic-related litter (personal protection equipment [PPEs] masks and gloves).

Presentations

CVW staff made several presentations about marine debris and about community-based social marketing to influence behavior change. These included presentations at Nauticus Museum (500+ people); on-line event sponsored by Nauticus (250+ attendees), two Sierra Clubs, Norfolk Botanical Garden, Chesapeake Bay Commission, Hampton Roads Planning District Commission, and a university class During these presentations, resources, data, and information about the VMDRP, Joyful Send-off Community-Based Social Marketing campaign, balloon monitoring, and mid-Atlantic regional planning on marine debris prevention were shared with attendees.

CVW also presented a keynote presentation to the VA Lakes & Watershed Assn Annual Conference (214 attendees), and spoke to two university classes about using community-based social marketing to influence behavior change related to marine debris.

Media

CVW staff was interviewed by reporters about PPE litter. Media coverage resulted from a press release that CVW distributed about the Governor's Executive Order #77 which will reduce the use of bottled water, straws and other single-use plastics from all government agencies and

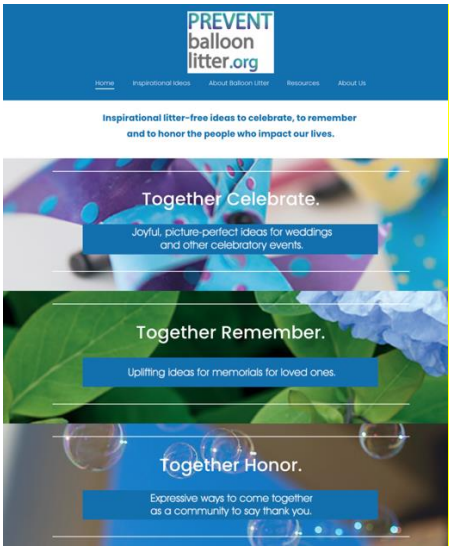
universities. Other press releases that announced the publication of CVW's two reports (about bottles, cans, and balloon-related litter) also generated some press coverage.

Cleanups
coordinated more than 120 litter cleanups as part of the International Coastal Cleanup. A large cleanup in VA Beach in April (400+ volunteers) had extensive media coverage.

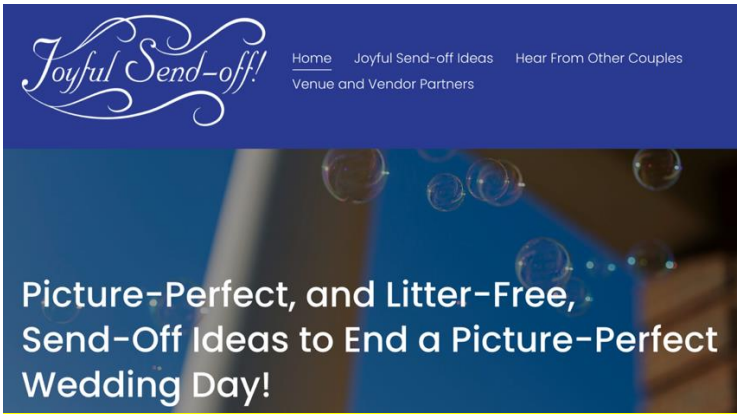
Social Media
CVW maintained websites and Facebook pages (CVW, VPPPN, Keep it Beachy Clean, PreventBalloonLitter.org, and JoyfulSendoff.org), and continuously updated a spreadsheet showing local adoption of bag fees on http://www.longwood.edu/cleanva/bags.html and on LitterFreeVA.org;

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 VA 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 throughout 2021 for both pages.



The PreventBalloonLitter.org website, designed by VA 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 VA 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.

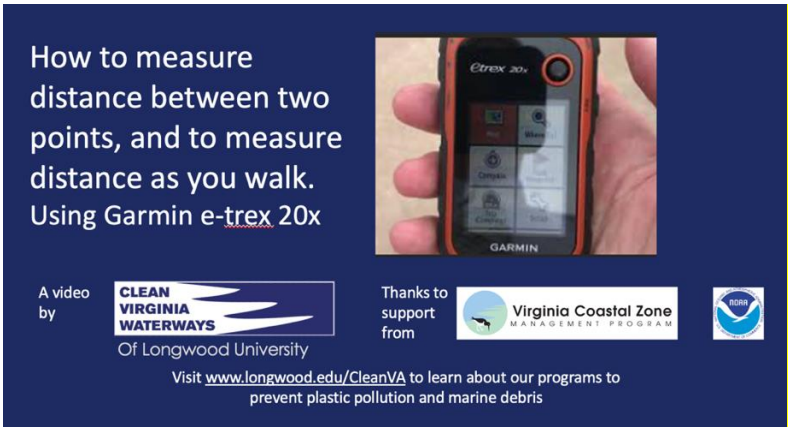
Videos:
Under previous grants, CVW and the VA CZM Program co-produced four animated videos that show the impacts that balloon litter has on the environment, wildlife, and power outages. The videos also feature litter-free ideas on ways to celebrate without releasing balloons. Meetings of the Virginia 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 2022.
All videos are available on CVW's YouTube Channel.
https://www.youtube.com/c/CleanVirginiaWaterwaysofLongwoodUniversity

Name of Video	Views
Virginia Abandoned & Derelict Work Group zoom meetings	1,263
Balloons as Litter – in English	275,257
Balloons as Litter – in Spanish	6,716
Prioritizing Reuse (a webinar by the Virginia Plastic Pollution Prevention Network)	166
VA Marine Debris Reduction Plan – recorded zoom meetings	772
Microplastics – an overview	451
How to use GPS unit for measuring distances	35,341
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 VA 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 VA CZM Program grant. Amazingly, this video has been viewed more than 35,000 times.



This video can be viewed on YouTube at:
https://www.youtube.com/channel/UC79VQJ1IkeGbKJDT-6owRyw

G. Microplastics

CVW assisted George Mason and Old Dominion Universities on developing and implementing marine debris and microplastic research projects.

Marine Debris Reduction in the Mid-Atlantic (Product #1)

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 VA CZM Program staff often provided guidance and background information to the Mid-Atlantic Marine Debris Work Group.

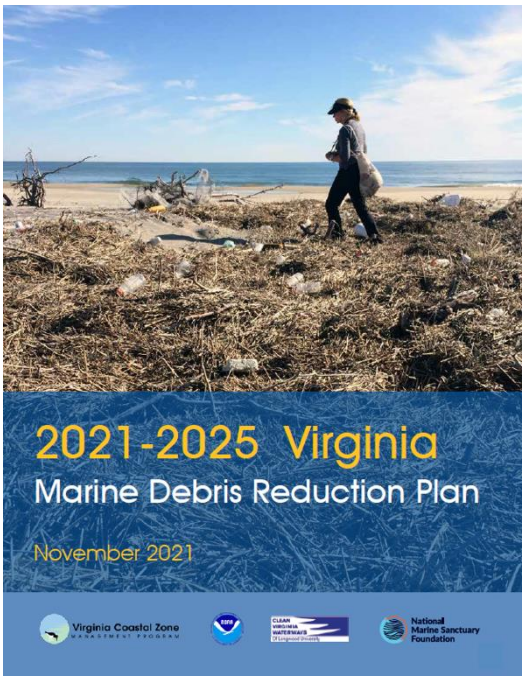
Specifically, the VA CZM Program and CVW contributed to the expansion of a CBSM campaign in Mid-Atlantic states to reduce the intentional release of helium-filled balloons. CVW and VA CZM Program staff assisted MARCO with many aspects of its grant from NOAA Marine Debris Program including development of a campaign strategy, messages, and materials, and consultations with Dr. Doug McKenzie-Mohr, the premier expert on Community-Based Social Marketing. This project involved close collaboration with three aquariums in the Mid-Atlantic.

CVW and the VA CZM Program staff also assisted MARCO in writing a Letter of Interest for a FY22 Marine Debris Prevention Grant to reduce the use of single-use water bottles on beaches and other waterfront recreation areas.

Mid-A Marine Debris Summit
The VA CZM Program, CVW and the Mid-Atlantic Marine Debris Work Group all contributed to planning all aspects of the Mid-A Marine Debris Summit which was held virtually in July 2021. CVW staff provided extensive event planning and zoom-platform assistance during the three-day event and also edited the summit recordings for placement on YouTube. View the recordings from the Summit here:
https://www.youtube.com/results?search_query=MARCO+mid-atlantic

CVW & CZM also contributed extensively to NOAA's Mid-Atlantic Marine Debris Action Plan (published May 2021), and signed up as partners on several Actions in the Plan.

Update of Virginia Marine Debris Reduction Plan (Product #2)



The Virginia Marine Debris Reduction Plan (VMDRP), was the first such plan on the East Coast when it was created and published in 2014. Updating that plan was part of this grant.

While the updated plan was published in November 2021, most of the work on the plan was accomplished during this grant period.

In developing the 2021-2025 VMDRP, CVW and the VA CZM Program engaged more than 100 stakeholders in phone interviews and online workshops to gather their views on the actions and priorities to be included in the updated plan. They engaged researchers, litter prevention experts, local and state governments, nonprofit organizations, businesses, and other stakeholders, then consolidated the input to craft the updated VMDRP. They also worked with NOAA's Marine Debris Program staff to align the VMDRP with the Mid-Atlantic Marine Debris Action Plan (published in May 2021). As this grant ended, CZM Program staff were designing the VMDRP, and it was officially published in November 2021. A media release led to a TV spot on WAVY and an article on its website (https://www.wavy.com/news/virginia/virginia-coastal-zone-management-program-outlines-plan-to-reduce-waste-in-coastal-waterways/)

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.

Production of the VMDRP was assisted by the NOAA Marine Debris Program via a $3000 grant from the National Marine Sanctuary Foundation.

The updated plan 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 at https://www.deq.virginia.gov/coasts/marine-debris
or from the Clean Virginia Waterways’ publication page:
http://www.longwood.edu/cleanva/publications.html

Policies & Laws Created or Inspired Under the 2016-2020 5-year Section 309 Strategy (Product #3)

Several policies and laws that support waste minimization of the most common and harmful items found as marine debris were implemented during the 5-year period covered by the 2016-2020 5-year Section 309 Strategy. These included policies and laws that impact the use of single-use plastic bags, food and beverage packaging, and helium-filled balloons.

Single-use Plastic Bags

The first legislation in Virginia on **single-use plastics** was passed and signed by the Governor during this grant period. In 2020, legislation (SB 11) passed in Virginia allowing counties and cities to impose a five-cent fee for plastic bags provided to consumers by certain retailers.

As of February 2022, five local governments in Virginia adopted fees that were enacted on January 1, 2022: Alexandria, Arlington, Roanoke, Fairfax County and Fredericksburg. In Falls Church City, the fee will start on April 1. 2022, and in Loudoun County on July 1, 2022. Other local governments are in the process of considering implementing a fee.

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. CZM and CVW created resources to facilitate local governments' adoption of fees on single-use plastic bags including a webinar for local and statewide nongovernmental organizations during which CVW shared results from other bag fees. Guest speakers shared data about the large reduction in litter that was documented after Washington D.C. adopted a fee on shopping bags.

- View the webinar: https://youtu.be/ACPKXpiPXjw
- Visit the "Single-use Plastic Bags: Common Litter in Virginia" webpage: http://www.longwood.edu/cleanva/bags.html
- Look at the spreadsheet showing status of bag fees in Virginia: https://docs.google.com/spreadsheets/d/1YrOMCAap0g1sWZa5Ctmp4r6noyaHOaiFTaORr33d5Yc/edit?usp=sharing

Virginia's Litter Tax

CVW continued to engage with nonprofits, including Clean Fairfax, LitterFreeVA.org, Lynnhaven River NOW, and the Virginia Sierra Club, as they sought to have the Virginia Litter Tax increased for the first time in more than 40 years. While Clean Virginia Waterways doesn't lobby legislators, it does share information from its 25-year database about litter in Virginia. 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 $40 annually if it had been indexed to inflation. A related bill, HB 502, passed that raised the existing penalty for litter tax delinquency by $100.

Link to the VPMDR Plan: Original research done by CVW in 2014 uncovered the fact that the Virginia Litter Tax had never been increased since it was started in 1977**.** CVW has publicized the information about the lack of increases in the Virginia Litter Tax since its establishment despite a growing population in Virginia and increased usage of single use food and beverage packing throughout the state.

Releasing Helium-filled Balloons

Virginia was one of the first states in the nation to restrict the releasing of helium-filled balloons when it passed a law in 1991 that prohibited a person from knowingly releasing 50 or more balloons within an hour. 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.

Clean Virginia Waterways (CVW) assisted policy makers by writing and sharing two reports that summarized extensive research about littered beverage containers and balloon-related litter. The report ***Balloons and Plastic Ribbons: Deadly Litter on Virginia's Remote Beaches*** was included in a tool kit for legislators that was created by the VA Conservation Network and the VA Aquarium; it was considered instrumental in the 2021 General Assembly decision to ban the intentional release of balloons in Virginia. CVW's data collected during the annual International Coastal Cleanup (ICC) in Virginia also informed policy makers as they voted to phase out the use of expanded polystyrene (EPS) in VA.

Expanded Polystyrene (EPS)

Phasing out the use of expanded polystyrene (EPS) food service containers was also supported by the Virginia General Assembly in 2020 with bill HB 533**,** and passed again 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. Chain restaurants are required to stop using such containers by July 1, 2023, and all other food vendors have to discontinue use by July 1, 2025. The bill provides a process by which a locality may grant consecutive one-year exemptions to individual food vendors on the basis of undue economic hardship.

Reducing Single-use Items at Universities and Government Agencies: Executive Order 77

Governor Northam's Executive Order 77 calls for state agencies and state-funded universities to stop the use of plastics and polystyrene items in favor of better alternatives. When students return to classes in late August, disposable plastic bags, single-use plastic and polystyrene food service containers, plastic straws and cutlery, and single-use plastic water bottles will not be on campuses.

Clean Virginia Waterways staff provided background data about plastic pollution to the Virginia Department of Environmental Quality as it worked to implement the governor's Executive Order 77 and presented a webinar to 300+ attendees.

VA Conservation Network's Briefing Book for Legislators

CVW was a lead author of the plastic pollution chapter in this book, calling for extended producer responsibility, implementation of a bottle bill, an increase in the Virginia litter tax, a possible statewide fee on plastic bags, and other legislative solutions.

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.

Plastic Waste Prevention Advisory Council
Virginia's Governor approved HB 1354, and the formation of a Plastic Waste Prevention Advisory Council 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 formed and met three times in 2021**.** Clean Virginia Waterways staff presented an extensive overview of the sources and impacts of litter (most of which is made of plastic) to the Council, and urged the Council to recommend changes on the systemic level to actually reduce (prevent) the creation of waste, and to not just look at down-stream and post-consumer solutions such as recycling.

Measuring Attitudes About Plastic Pollution

CVW and CZM staff worked with OpinionWorks, and engaged key stakeholders in the process, to develop a statewide survey of voters to determine their attitudes on plastic pollution. The survey will also test words and messages that are key to outreach efforts, and identify trusted messengers. The survey will be sent out in February 2022 and will be partly funded by this grant as well as the FY21, Section 309 grant to CVW. This survey of voters is one of the top ten priority projects listed in the 2021-2025 VMDRP. It was started earlier than expected since Covid-related factors led to unspent funds in the Travel and Supplies categories, so CVW obtained permission from the VA CZM Program to shift unspent funds from Travel and Supplies to Contractual.

Strategy for Derelict Clam Net Removal on Virginia's Eastern Shore

In 2021, the CZM Program Manager, Laura McKay, drafted a strategy for removing clam netting that escapes onto Virginia's beaches either from storms dislodging them or by a few "bad actors" not taking care to dispose of nets properly. After seed clams from a hatchery are moved out into the water for "grow-out," clam growers cover the clams with plastic mesh netting to prevent predators such as whelks, rays and crabs from consuming them. The need for a derelict netting removal strategy was initiated by then Secretary of Natural and Historic Resources, Matthew Strickler. Laura McKay negotiated the draft strategy with VIMS, shellfish growers, the VA Marine Resources Commission and CVW, all of whom signed the strategy agreement. In order to keep the issue "low key" and not adversely affect responsible clam growers, the strategy was not publicized, but rather used as an internal agreement among the entities to ensure that loose, derelict nets are removed form beaches and marshes as quickly as possible. Buried nets are to be left in place so as not to disturb habitat. The agreement also ensures that net removal does not interfere with beach nesting bird season. The strategy addresses how the public and owners of conserved lands can report derelict nets by calling the Marine Resources Commission, who in turn can report the location to the Director of the Shellfish Growers of Virginia, who then contacts the nearest clam grower to pick up the net if it is loose.
See Appendix IV for the agreement.

Other Policies

Another direct result of the VMDRP: Virginia State Parks adopted a system-wide policy banning the use of helium-filled balloons during events in the parks. Several universities also expanded their litter-prevention policies to include banning confetti (most of which is made of plastic) and helium-filled balloons on campus and off-campus college-related events. Some took action to curtail the use of balloons during outdoor graduation ceremonies.

Balloon Debris Monitoring (Product #4)

During this grant period, surveys were conducted on Fisherman Island National Wildlife Refuge on October 27, 2020, April 4, 2021, and August 8, 2021. 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.

On October 27, 2020, the survey revealed 300 pieces of balloon-related debris which represented 12.5% of all debris items (N=2404). Balloon-related litter was the most frequently found type of litter for this survey, followed by plastic beverage bottles (n=145). There was also a high prevalence of foam pieces (n=1004) and hard plastic pieces (n=224), 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. Seven researchers and volunteers participated in this survey. Personal protection equipment (PPEs) including masks and disposable gloves were added to the data sheet for this cleanup. The app *Marine Debris Tracker* was tested, but did not work well since Fisherman Island was too remote for a good internet connection.

On April 4, 2021, a total of 263 pieces of balloon-related debris were recorded, which represented 20% of all debris items (n=1314). Balloons-related litter were the most frequently found type of debris, followed by plastic beverage bottles (n=155). A high prevalence of hard plastic pieces (n=190) was recorded during this survey, but were not included in rankings due to the uncertainty surrounding the source from which the pieces originated.

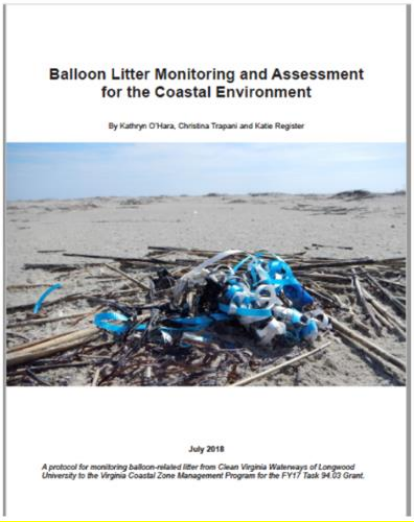
A survey on August 3, 2021, found 175 balloon-related pieces of litter, representing 10.9% of all debris. For this survey, balloons were the second most frequently found type of debris, behind plastic bottles (n=177). There was a high prevalence of foam pieces (n=372) recorded during this survey, but 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.

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.

The protocol 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=738) were the most commonly found type of debris during the three surveys. The rest of the top-ten list includes plastic pieces (n=546), plastic bottles (n=477), construction materials (n=296), rope pieces (142), plastic bottle caps (n=133), glass bottles (n=119), buoys (n=99) and food wrappers (n=97).

See Appendix IV for all data.

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, construction materials, and clam nets.

Rank	Item	Number
1	Balloon-related items	738
2	Bottles, plastic	477
3	Construction materials	296
4	Clam nets	283
5	Rope pieces	142
6	Bottle caps, plastic	133
7	Bottles, glass	119
8	Buoys, floats	99
9	Food wrappers	97
10	Beverage cans, metal	86

Table: Data from the three surveys show that balloon-related debris was 10.9% to 20.0% of all debris items found

Survey Date	Balloon-related debris items	Other debris items	All items	Percent of all debris that was balloon-related
10/27/2020	**300**	**2104**	**2404**	**12.5%**
4/4/2021	**263**	**1051**	**1314**	**20.0%**
8/3/2021	**175**	**1433**	**1608**	**10.9%**
TOTALS	**738**	**4588**	**5326**	**14.5%**

All Balloon-related Litter

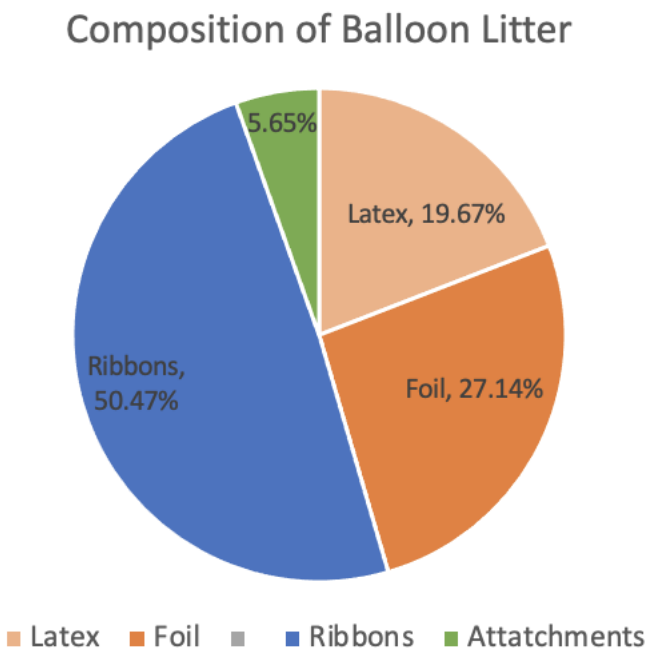
For each balloon litter item recorded, specific information was obtained on the type (latex, foil, weather balloon) and quantity. Data were also collected about ribbons and other attachments. The 738 balloon-related litter items from these three surveys included 145 latex balloons, 200 foil balloons, 372 plastic ribbons, and 21 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	145
Foil Balloons	200
Ribbons	372
Attachments	21
Total	738

Composition of Balloon Litter

Of the balloon-related litter, 50.5% was made up of plastic ribbons (n=372), 46.8% was made of balloons (n=345), and the remainder 5.6% was made up of other attachments (n=21). Foil balloons (n=200) comprised of 27.1% and latex balloons (n=145) were 19.7% of all balloon related debris.



Plastic ribbons accounted for 50.47% of the balloon-related litter on Fisherman Island.

Latex vs. Foil Balloons

Similar to last year's monitoring, latex balloons (n=145) were outnumbered by foil balloons (n=200). Foil balloons comprised 57.98% of the total balloons, and latex balloons were 42.02%. 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 372 plastic ribbons were collected during this study period. This count is a 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 21 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=17)
Happy Valentine's Day (n=10)
Mother's Day (n=3)
Graduation (n=3)
Congratulations (n=2)
Get Well Soon (n=1)

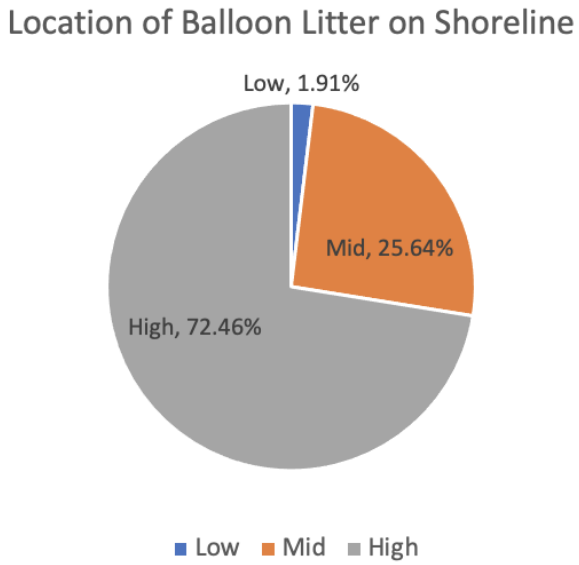
Happy Birthday balloons were also the most common type of pre-printed balloon litter in the previous year's monitoring (2020-2021).

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).

Most balloon-related debris, like this group of balloons and ribbons, were found high or mid-beach.

When aggregating data from these three surveys, we found that 72.4% (n=342) of balloon related litter were found above the high tide line and 25.6% (n=121) were found mid-beach. Only 1.9% (n=9) of balloon litter were found low on the beach. There was an increase in the amount of litter found high on the beach in comparison to last year's survey results, where only 49.2% of litter was located above the high tide line.



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.

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 type 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 283 pieces. Thus, clam nets were the 4th most commonly found type of debris in the monitoring site.

Date of monitoring	Clam net pieces recorded
Oct. 27, 2020	103
April 4, 2021	78
Aug. 3, 2021	102
Total	283

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 I: Virginia Plastic Pollution Prevention Network – Topics and speakers from monthly webinars

Appendix II: Stormwater and Litter Workshop—Agenda and attendees

Appendix III: Editorial: Virginia's Plastic Pollution Challenge

Appendix IV: Strategy for Derelict Clam Net Removal on Virginia's Eastern Shore

Appendix V: Monitoring Balloon-related Debris: raw data

Appendix I: The Virginia Plastic Pollution Prevention Network

This list shows the VPPPN monthly webinars' speakers and topics. Members of the VPPPN can view recordings of past webinars by going to VaPreventPlasticPollution.org

October 2020
Sarah Stewart, Plan RVA: Don't Trash Central Virginia Campaign
Main Topic: Legislative Info
Jen Cole, Clean Fairfax: Intro by Video
Katie Register, CVW: Additional info about Clean Fairfax
Jim Deppe, VACA, Lynnhaven River NOW: VA Conservation Network's Common Agenda
Attendees: 32

November 2020
Erin Chase: Virginia Network for Democracy and Environmental Rights Intro
Christina Trapani: Eco Maniac Company Intro
Jessica Steelman: A-NPDC/Greenworks Intro
Main Topic: Green Business
Tom Griffin, Virginia Green Travel: Intro to Virginia Green program
Matt Gove, Surfrider Foundation: Ocean Friendly Restaurant Program
Attendees: 37

December 2020
- Plastic Pollution & the CBF; Natasha Rathlev, Chesapeake Bay Foundation (Richmond Office)
- The Next Swell; Jackie Bort
- "No Butts About It"; Wayne Jones, Keep Suffolk Beautiful, askHRgreen.org
- New Abandoned & Derelict Vessel Work Group; Katie Register
- Balloon & Polystyrene Legislation: Mark Swingle
- Local governments' action on bag fees; Zach Harrington, Clean Fairfax

Attendees: 24

2021 Topics
January 2021
- Cigarette litter and fishing line recycling programs in VB; Mike Moore, Virginia Beach Parks and Recreation:
- Shiver in Virginia events; Keep VA Beautiful
- Legislative updates; Jim Deppe (EPS bill) and Mark Swingle (balloon bill)
- Planning VPPPN topics for 2021
- Starting a Facebook group page for VPPPN
- Victoria Tolson, Nauticus: Planet or Plastic Exhibit

Attendees: 26

February 2021
- Legislative updates; Jim Deppe (EPS bill) and Mark Swingle (balloon bill)
- PPE (masks and gloves) litter on national, state, and local level
    - Ocean Conservancy -- Sarah Kollar
    - Clean VA Waterways -- Katie Register

    - VA Beach -- Mike Moore
- Planning Earth Day cleanups in VA Beach

  Attendees: 23

March 2021

- Adopt a Stream program in Prince William County -- Veronica Tangiri and Jess McCaulley
- Mid-Atlantic Marine Debris Summit -- Virginia Witmer, VA Coastal Zone Management Program
- Straw programs (reducing the use of single-use plastic straws)
    - Christina Trapani, overview of awareness videos & KIBC's 2018 efforts
    - Rebekah Eastep, Ask HRgreen.org about their two 2019 straw campaigns in restaurants
    - Katie Register, Clean VA Waterways' Kick the Straw program for schools
    - Meghann Quinn (DEQ) and Tom Griffin (VA Green) re: their work in Richmond
- Legislative update from Karen Forget, Lynnhaven River NOW
- Earth Day cleanups in VA Beach
- Partner updates
    - Fees on Plastic Bag: "Next Steps" discussion to be held in April

  Attendees: 24

April 2021

- Aaron Provencio: Wildlife Center of Virginia
- Theresa Augustin: Norfolk Botanical Garden
- Natasha Rathlev: CBF, Clean The Bay Day
- Mid-Atlantic Marine Debris Action Plan: Christy Kehoe, NOAA Marine Debris Program
- Governor Northam's Executive Order 77: Meghan Quinn, DEQ
- Bag fees in Virginia -- taking the next step. Katie Register, CVW
- Earth Day Events: What is your organization up to for Earth Day?

Attendees: 29

May 2021

Cigarette Litter Programs in Virginia

Attendees: 25

June 2021

Oceana's marine debris programs and resources

Attendees: 24

July 2021

No meeting so attendees could attend the Mid-A Marine Debris Summit

August 2021

Fees on Single-use Plastic Bags in Virginia: resources and taking action

Attendees: 23

September 2021

Break Free From Plastic Pollution Act

Attendees: 18

Appendix II: Stormwater and Litter Workshop

Stormwater + Litter Workshop

Thursday, December 9, 2021

Agenda

Morning Session (10 AM to Noon)
Welcome

Community Engagement: Case Studies
Progress in Community Engagement: Water Pollution and Clean Waterways Awareness

- **Veronica Tangiri,** Prince William Soil and Water Conservation District

- *Operation Stream Shield*
  - **Emily Burton,** Fairfax County

Update on MS4 Permits in Virginia

- **Jeff Selengut,** MS4 Permit Writer, VA Department of Environmental Quality

EPA's Trash Free Waters Program's MS4 Trash Compendium & other Resources

- **Layne Marshall and Eric Ruder**

Afternoon Session (1 to 3:30 PM)

Bandalong Litter Trap: Site Selection and Installation

- Tim Hughes, Prince William County, Virginia Watershed Management Branch and Environmental Services Division

Trash Traps: Small and Large
Hannah De Frond
International Trash Trap Network Coordinator (in collaboration with the Ocean Conservancy and the University of Toronto Trash Team)

Data: Measuring Success By Using the Ocean Conservancy's Online Database (TIDES)

- Sarah Kollar, Coordinator, Trash Free Seas Program, Ocean Conservancy

Case Study: Using TIDES Data on Plastic Bags in Virginia
Katie Register, Executive Director, Clean Virginia Waterways of Longwood University

Virginia Marine Debris Reduction Plan: The Stormwater Connection

- **Laura McKay,** Manager, Virginia Coastal Zone Management Program and Katie Register, CVW

Partners:
The workshop was coordinated by Clean Virginia Waterways of Longwood University with the following partners:

- Clean Virginia Waterways of Longwood University
- Virginia Coastal Zone Management Program
- Virginia Lakes and Watershed Association
- Alliance for the Chesapeake Bay
- Virginia Water Monitoring Council
- National Oceanic and Atmospheric Administration, Marine Debris Program

Attendee List

	First Name	Last Name	Affiliation (Name of your employer)
1	Jillian	Adair	US EPA R3
2	Haley	Amini	Baltimore County EPS
3	Karen	Andersen	Friends of the Shenandoah River
4	Kathie	Angle	City of Newport News
5	Kelly	Atkinson	Piedmont SWCD
6	Christine	Ausink	City of Hampton- Clean City Commission
7	Nicole	Basenback	University of Maryland Extension
8	John	Bateman	Northern Neck Planning District Commission
9	MacKenzie	Bellimam	City of Fredericksburg
10	Cecilia	Boyd	Langley Air Force Base
11	Jennifer	Bradley	Herndon Solutions Group
12	Abby	Braman	Pearl Riverkeeper
13	Teri	Brothers	Central Virginia Community College
14	Megan	Brown	Henrico County
15	Amanda	Brown	Keep Prince William Beautiful
16	Barbara	Brumbaugh	City of Chesapeake, VA - Dept of Public Works
17	Emily	Burton	Fairfax County Government

18	Pat	Calvert	Virginia Conservation Network
19	Lea	Carmichael	EPA
20	Caroline	Carter	Caroline Voice-Over and Entertainment
21	Steven	Carter-Lovejoy	Virginia Sierra Club
22	Cody	Cash	City of Irving
23	Rebekah	Cazares	PlanRVA
24	Weedon	Cloe	Chesterfield County
25	Jen	Cobb	Henrico County
26	Patricia	Colatosti	Town of Christiansburg
27	Jen	Cole	Clean Fairfax
28	Tara	Copeland	City of Virginia Beach
29	GAYLE	Copening	City of Richardson, TX
30	Cassie	Cordova	James City County
31	Lyndell	Core	ARLINGTON County Parks
32	Hannah	De Frond	Ocean Conservancy & U of T Trash Team
33	Hunter	Digges	Town Of Warrenton
34	Audrey	Doan	City of Norfolk
35	Olivia	Dodson	Hampden Sydney college
36	Thomas	Dombrowski	Prince William County Watershed Branch
37	Carol	Doss	Upper Tennessee River Roundtable; Keep SW VA Beautiful
38	Jamie	Durden	City of Suffolk
39	Kamala	Espig	Keep Prince William Beautiful
40	Sam	Eubanks	Osprey Initiative
41	Deborah	Everitt	City of Newport News
42	Treyquan	Farmer	Clean Valley Council (Courtney Plaster)
43	Wyatt	Felt	VPI Technology Group
44	Jasmine	Ferrell	City of Mesquite
45	Kala	Fleming	Frontline
46	Rebekah	Flick	Virginia DEQ, Pollution Prevention
47	Jefferson	Flood	Virginia Coastal Zone Management Program
48	Kathy	Fonville	City of Mesquite
49	Emily	Foppe	Clean Fairfax
50	Kate	Fritz	Alliance for the Chesapeake Bay

51	Michelle	Fults	VDOT
52	Rick	Galliher	Virginia Bottle Bill Organization
53	CW	Gaskill	City of Norfolk
54	FAYULA	Gordon	Town of Vinton
55	Normand	Goulet	NVRC
56	Becky	Greenwald	Volunteer, Chesapeake Environmental Improvement Council
57	Adriana	Guzman	City of Virginia Beach
58	Megan	Hale	City of Chesapeake
59	James	Harlow	James River Park System, City of Richmond
60	Cynthia	Harris	City of Hampton
61	Greta	Hawkins	City of Hampton, Public Works
62	Stacey	Heflin	Henricopolis SWCD
63	Lucy	Heller	Alliance for the Chesapeake Bay
64	Kelly	Henshaw	City of Winchester
65	Lyn	Hill	Buckingham County
66	lyn	Hill	Buckingham County Administration
67	Chris	Hines	Central Virginia Community College
68	Brian	Hires	Sierra Club
69	Richard	Holley	Arlington County Park and recreation
70	Tim	Hughes	Prince William County Public Works Dept.
71	Wendy	Iles	City of Hampton
72	Gabriel	Irigaray	Roanoke Valley-Alleghany Regional Commission
73	Yuya	Ishizuka	StormTrap
74	Fleta	Jackson	City of Norfolk, Keep Norfolk Beautiful
75	Steven	Jackson	Isle of Wight County
76	Lisa Renée	Jennings	CBF
77	Makayla	Jennings	Clean VA Waterways, Intern
78	Aaron	Johnson	Howard EcoWorks
79	Dwayne	Jones	Goochland County
80	Wayne	Jones	city of Suffolk
81	Kelley	Junco	Road Commission for Oakland County
82	Scott	Kearby	Harford Land Trust
83	Sarah	Kempfer	Alice Ferguson Foundation

84	Sarah	Kollar	Ocean Conservancy
85	Mallory	Kyle	Longwood event staff
86	Rashaunda	Lanier-Jackson	PlanRVA
87	Jessica	Lassetter	City of Alexandria
88	Nancy	Lauer	Duke University
89	Tracey	Leverty	Keep Virginia Beautiful
90	Ben	Lewis	Northern Neck Planning District Commission
91	Nancy	Lilly	Lynchburg Water Resources
92	Cynthia (Cindy)	Linkenhoker	Roanoke County - Dept. of Development Services
93	ANTONIO	MARQUEZ	Prince William County Govt
94	Layne	Marshall	USEPA
95	Kimberly	Mattson	Clean Valley Council
96	Jess	McCaulley	Prince William Soil and Water Conservation District
97	Daniel	McDonald	City of Suffolk
98	Laura	McKay	Virginia CZM Program
99	Anita	McMillan	Town of Vinton
100	Priyanka	Mohandoss	Brown and Caldwell
101	Serena	Moncion	Potomac Riverkeeper Network
102	Katie	Morgan	NOAA/Lynker
103	Kim	Moshier	City of Newport News
104	Sara	Nichols	Keep Texas Beautiful
105	Raya	Nickerson	Town of Dumfries
106	Michelle	Nowlin	Duke Environmental Law and Policy Clinic
107	Ernest	Nunley	Virginia Highlands Community College
108	Laura	Nusz	City of Newport News
109	Ashley	Palmer	Northern Virginia Soil and Water Conservation District
110	Mukesh	Patel	Prince William County
111	Courtney	Plaster	Clean Valley Council
112	Meghann	Quinn	Virginia DEQ
113	Scott	Rae	City of Fredericksburg
114	Eric	Rduer	Industrial Economics, Incorporated
115	Katie	Register	Clean VA Waterways
116	Ande	Remington	NASA

117	Andrew	Rich	Newport News Waterworks
118	Mitchell	Rieley	Town of Christiansburg
119	John	Rocha Jr.	Central Virginia Community College
120	Francesca	Ross	Arlington County
121	Rogard	Ross	Friends of Indian River
122	Alexi	Sanchez de Boado	Clean Streams LLC
123	Deena	Sasser	Clean Valley Council
124	Jeffrey	Saunders	USAF
125	Trevor	Scruggs	VCCS
126	Julie	Searcy	Virginia Department of Health
127	Jeff	Selengut	VADEQ
128	Justin	Shafer	City of Norfolk
129	Craig	Simmons	City of Virginia Beach Public Works Waste Management
130	David	Singletary	Peninsula MN
131	Joshua	Sparkman	Ocean Conservancy
132	Steve	Spence	Retired
133	Sarah	Stewart	PlanRVA
134	Robert	Stieg	CEO, The Clermont Foundation
135	Lyndsey	Stone	Ramboll
136	Tracy	Stroinski	City of Newport News
137	Jill	Sunderland	Hampton Roads Planning District Commission
138	Veronica	Tangiri	Prince William Soil and Water Conservation District
139	Gabby	Troutman	Chesapeake Bay Foundation
140	Anna	Tuthill	VADEQ
141	Allie	Wagner	NVRC
142	Darryl	Walker	City of Petersburg, VA
143	Jane	Walker	VWRRC, Virginia Tech
144	Jessica	Weimer	Energy & Sustainability, Prince William County Public Schools
145	Madison	White	City of Norfolk
146	June	Whitehurst	City of Norfolk
147	Michelle	Williams	City of Norfolk, Stormwater
148	Derick	Winn	DEQ
149	Virginia	Witmer	Virginia Coastal Zone Management Program

Appendix III: Op-Ed in Richmond Times Dispatch: Virginia's Plastic Pollution Challenge

This Op-Ed was published in the Richmond Times Dispatch on June 20, 2021

By Katie Register, Executive Director, Clean Virginia Waterways of Longwood University

Virginia's Plastic Pollution Challenge

What can I tell you about litter in Virginia that you haven't seen with your own eyes?

Litter is increasingly in plain sight. Bottles, cans, cups, straws and food wrappers are discarded without a thought on our roadways.

This trash then travels via stormwater and ends up in our rivers, bays and ocean. About 60% to 80% of the trash in Earth's oceans comes from our behavior on land (the rest comes from boats and fishing).

We need only look around us at the litter we see every day to also see how much we use a permanent material – *plastic* – for temporary uses.

Annually in Virginia, there are hundreds if not thousands of litter cleanup events from the smallest (one landowner removing litter from her roadside property) to the larger events that engage thousands of community members. Sadly, in 2020, the pandemic reduced the number of Virginia volunteers (organized by Clean Virginia Waterways of Longwood University) from the usual 7,000 to 1,700.

The 2020 data collected by dedicated volunteers showed that (like most years) the Top Ten list is dominated by food and beverage-related single-use items – *most made of plastic*:

1. Cigarette Butts
2. Food Wrappers
3. Beverage Bottles (Plastic)
4. Beverage Cans
5. Grocery Bags (Plastic)
6. Take Out/Away Containers (Foam + Plastic)
7. Bottle Caps (Plastic)
8. Beverage Bottles (Glass)
9. Cups, Plates (Foam + Plastic)
10. Straws, Stirrers

Plastic litter, most of it related to food and beverages, was 83% of trash on Virginia's beaches during a study by the Virginia Aquarium, funded by the Virginia Coastal Zone Management Program (a network of state agencies and coastal localities).

Cleaning up is part of the solution, but is only remedial, not preventative.

We need a sea change – we need to "turn off the faucet" of plastic single-use waste in our lives.

Growing concern about plastic pollution is leading to increased willingness to take action through laws, policies and individual commitments.

Governor Northam's Executive Order 77 calls for state agencies and state-funded universities to stop the use of plastics and polystyrene items in favor of better alternatives. When students return to classes in late August, disposable plastic bags, single-use plastic and polystyrene food service containers, plastic straws and cutlery, and single-use plastic water bottles will not be on campuses.

Virginia has made some progress – polystyrene food containers (often called "Styrofoam") will be phased out over the next 4 years, and it is now illegal to litter *any* helium-filled balloons into the air. Local governments now have authority to place five-cent fees on single-use plastic bags. Funds raised from this fee will help local communities prevent and clean up litter.

More can be done. Virginia, with a population of 8.5 million people, generates less than $4 million per year from the Virginia Litter Tax. The tax ($20 per year) is paid by businesses that sell groceries and beverages. Litter tax funds are insufficient to cover the costs associated with prevention and removal of mis-managed solid waste. For example, a trash trap installed in a stream in Fairfax in 2020 cost more than $550,000 to install, and nearly $50,000 per year to maintain. Virginia can look to other states as it considers "right sizing" the litter tax. For example, Washington State (population 7.5 million) generates $11.4 million annually from its litter tax.

The soon-to-be released updated Virginia Marine Debris Reduction Plan by the NOAA-funded Virginia Coastal Zone Management Program provides a roadmap to reduce single-use litter, derelict fishing gear, abandoned boats, and microplastic debris.

The Virginia Plastic Pollution Prevention Network, founded in 2020, is linking groups across Virginia. The newly-formed Plastic Waste Prevention Advisory Council will advise Virginia's General Assembly on further actions to reduce plastic pollution, litter and marine debris. Solutions could include creating an economically sustainable bottle deposit program (a "bottle bill") or increasing the responsibility of producers.

Laws and policies are only part of the solution. Our daily choices and decisions matter tremendously. Choose reusable bags, coffee mugs, and water bottles. And pick up litter—whether on your own or as part of a community effort. It all adds up.

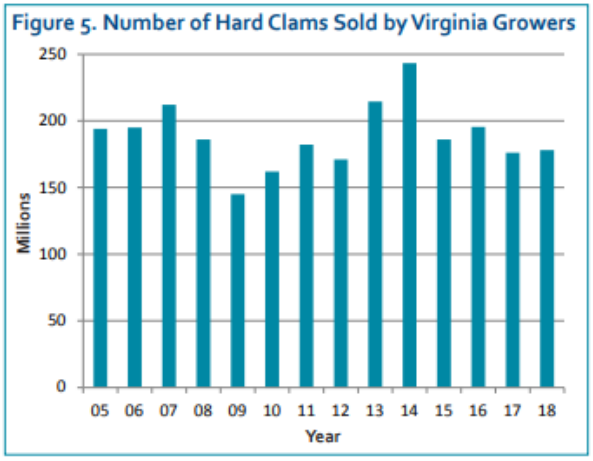
Katie Register is executive director of Clean Virginia Waterways of Longwood University, and co-founder of the Virginia Plastic Pollution Prevention Network. She has organized statewide litter cleanups since 1995. Contact her at registerkm@longwood.edu.

This editorial was run in the Richmond Times Dispatch on
https://richmond.com/opinion/columnists/katie-register-column-virginias-plastic-pollution-challenge/article_e5d6eb5d-85b9-5906-bdf4-efc96aa52c9a.html
or
https://richmond.com/opinion/columnists/katie-register-column-virginias-plastic-pollution-challenge/article_e5d6eb5d-85b9-5906-bdf4-efc96aa52c9a.html#tncms-source=login

Appendix IV: Strategy for Derelict Clam Net Removal on Virginia's Eastern Shore

Background

Virginia leads the nation in hard clam (*Mercenaria mercenaria*) production and the Eastern Shore of Virginia is host to that vital industry. According to the latest Virginia Shellfish Aquaculture Situation and Outlook Report from August 2019, in 2018 clam growers brought $38.8 million in farm gate value and about 175 jobs to Virginia's Eastern Shore.



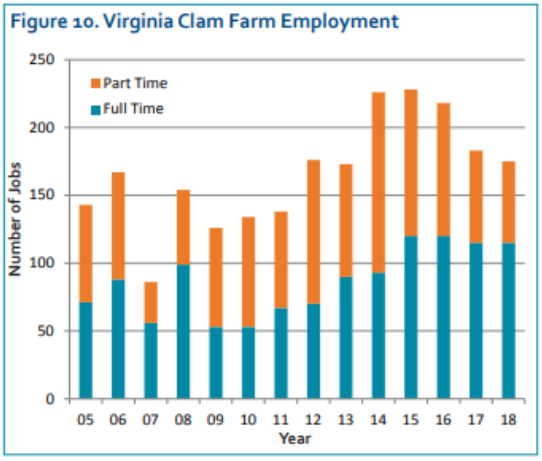


Photo by Virginia Institute of Marine Science

Hard clams ready for market. (Courtesy K. Hudson/VIMS)

Virginia's hard clam aquaculture occurs on the Seaside of Virginia's Eastern Shore and the lower Bayside where salinity is sufficient to support clams. Clams are spawned in hatcheries and when they reach sufficient size are "planted" on subaqueous leases. Clams use a strong muscular "foot" to burrow into the sediment. Clam growers cover their clams with plastic mesh netting, which is essential to prevent predators such as whelks, rays and crabs from consuming them. Sometimes these nets can be re-used but they do become fouled with organisms. The nets are made of white or black, UV stabilized, polypropylene plastic and are 12, 14 or 17 feet in width and several dozen feet in length.

The Challenge

Virginia's clam growers work very hard to ensure that the plastic netting used to cover their clams and protect them from predators are properly disposed of after use. However, occasionally these nets escape into the environment either from storms dislodging them or by a few "bad actors" not taking care to dispose of nets properly. Plastic clam netting that gets loose in the environment may entangle wildlife in the water and when washed ashore, on the beach and in the wetlands of the Eastern Shore. This abandoned netting may not only entangle birds, Northeastern beach tiger beetles and other wildlife, but creates an eye sore and eventually contributes to the ever-increasing amount of plastic and microplastics in our coastal and ocean waters.

Removal Strategy

In 2017 the Virginia Coastal Zone Management (CZM) Program and its marine debris reduction partner/grantee Clean Virginia Waterways (CVW) organized a meeting in collaboration with the Director of Shellfish Growers of Virginia (SGV) at the VIMS Eastern Shore Lab to discuss the issue of derelict clam nets. Attendees included several clam growers, the Director of the Shellfish Growers of Virginia (SGV), scientists from the Virginia Institute of Marine Science, the Eastern Shorekeeper and The Nature Conservancy (TNC). At that meeting, it was decided SGV would create an email address (cleanupva@shellfish.org) to which agencies and organizations that own conservation lands on Virginia's Eastern Shore (e.g., US Fish & Wildlife Service, Department of Conservation & Recreation and Department of Wildlife Resources and The Nature Conservancy) could report derelict nets that washed up on their properties. When a report is received, the Director of SGV would then call the nearest shellfish grower to collect the net as long as it is loose on the surface of a beach or wetland.

When several nets were found on Chincoteague after a storm in 2018, they were reported by a CVW contractor to the SGV website and quickly removed by SGV members.

In spring 2021, nets were observed on the beaches around the mouth of Old Plantation Creek on the lower Bayside of the Eastern Shore. No reports had been sent to the shellfish growers' cleanup website. It became clear that the removal strategy needed updating. This expanded strategy addresses emerging needs as well as improvements to the discovery and removal of derelict clam nets.

On a June 8 2021 call led by Secretary of Natural and Historic Resources Matthew Strickler with representatives from VIMS, CZM and shellfish growers, it was agreed that:

- removal will be done quietly without publicity as requested by the clam industry;
- removal efforts should take care not to disrupt protected wildlife habitat; and
- research should be undertaken to find:
    - opportunities for recycling clam netting; and
    - alternatives to plastic clam netting

Process for Reporting Derelict Clam Nets

- Managers of conserved land on Virginia's Eastern Shore (e.g., The Nature Conservancy, the Virginia Department of Wildlife Resources, the Virginia Department of Conservation and Recreation, the Chesapeake Bay Foundation and the U.S. Fish & Wildlife Service) should report derelict clam nets to the cleanupva@shellfish.org email address. This agreement will be shared with these entities.
- Private individuals may be instructed to report nets they see on their own or other properties to the Marine Resources Commission's dispatch number (800.541.4646). The report would then be forwarded to appropriate VMRC staff.
- If nets are found on private property, landowners must be contacted for permission to remove nets.
- If nets are found on public lands by the public (not the owner/manager), they should report it to the land owner/manager who can then report it to cleanupva@shellfish.org. SGV must then contact the land owner/manager for permission to remove the nets.

Schedule for Removals

- Annual clean-ups may be scheduled in October each year if needed.
- Individual loose net removals can occur between October and February as nets are reported.

Process for Removals

In general, SGV agrees to remove from waterways, beaches, and marshes any loose, derelict clam netting visible from the water following the process/guidelines below and after permission has been secured from the owner/manager of the private property or conserved land on which the nets are found:

- Only loose nets will be removed. Buried and semi-buried nets will be left in place.
- Loose net removal will be conducted using shallow draft boats.
- Permission from the landowner or manager must be secured prior to removal.
- Teams of clam industry and/or Clean Virginia Waterways (CVW) volunteers will scan the shoreline from the boats, come ashore when loose nets are seen, record data on the net(s), lift the nets onto the boat and deliver nets to a landfill site.
- No heavy equipment (e.g., UTVs, any wheeled/tracked vehicles, shovels, pulling tools) is to be brought onto beaches or wetlands to attempt removal.
- Removal teams will record data on forms (see attached form) supplied by CZM/CVW on:
    - location (GPS coordinates) where nets were found
    - date nets were collected
    - number and dimensions of nets
    - color of nets

  CZM/CVW will store these data privately so that dimensions of the issue can be documented for use in researching recycling opportunities and understanding whether debris reduction is being achieved.

Background on Wildlife Concerns

The Eastern Shore is host to a number of animals of conservation concern. The federally threatened Northeastern Beach Tiger Beetle (*Habrosceliomorpha dorsalis dorsalis formerly genus name Cicindela*), lives on the broad sandy beaches on the bayside of the Eastern Shore. The beaches, mudflats and marshes throughout the Eastern Shore also provide critical nesting, foraging and roosting areas for migratory birds throughout the year. Many species are protected under the federal or state Endangered

Species Act or are identified as Species of Greatest Conservation Need in Virginia's Wildlife Action Plan. The relative importance of this region to migratory birds is recognized through several designations such as Western Hemisphere Shorebird Reserve Network site of International Importance and an Audubon Important Bird Area of Global Status.

Northeastern Beach Tiger Beetle (NBTB) Habitat Needs and Concerns

Burrow of a larva of *Cicindela dorsalis dorsalis*

Adult NBTB flying over the sand during the day and night in warm weather and feeding within the intertidal area on amphipods and small insects. Adults are primarily active and mating from June to August with their numbers peaking in July. Females will dig burrows (5-8 cm deep) in the upper intertidal zone and lay a single egg in each. The eggs hatch after 12 days and the larvae undergo three instar stages. The larvae do not leave these burrows for 2 years, feeding on invertebrate prey, which happens to pass by the entrance of their burrow. They spend November through March in hibernation in their burrows and, after two winters, emerge as adults in June. NBTB typically inhabit beaches that are at least 5 yards wide with some sand above high tide mark. Vehicular traffic on beaches and heavy foot traffic are detrimental to the species, by compacting the sand and directly killing the larvae

Shorebird Habitat Needs and Concerns

Virginia's Eastern Shore is one of the most important regions for migratory birds in the Western Hemisphere. Its coastal habitats support hundreds of thousands of shorebirds, Waterbirds and waterfowl throughout the year. March through September is a particularly important time that includes critical nesting and migration stages of their life cycles. Excessive disturbance to these habitats during this time can result in reproductive failure and reduced fitness. According to the Atlantic Flyway Shorebird Initiative Business plan (https://atlanticflywayshorebirds.org/documents/AFSI_Business_Plan_2015.pdf) 50 percent of shorebird species or subspecies regularly occurring in Canada and the United States are either highly imperiled or species of high concern. Thirteen of Virginia's shorebird species are designated as Species of Greatest Conservation Need.

National Geographic recently reported that "world plastic production has increased exponentially from 2.3 million tons in 1950 to 162 million in 1993 to 448 million by 2015" and that "by 2050 virtually every seabird species on the planet will be eating plastic. https://www.nationalgeographic.com/environment/slideshow/plastic-facts . At least 8 million tons of plastic end up in our oceans every year and make up 80% of all marine debris. (https://www.iucn.org/resources/issues-briefs/marine-plastics

Strategy Approval

This strategy is a collaborative effort of and approved by:

Steven G. Bowman
Commissioner, Virginia Marine Resources Commission

10/12/2021
Date

Mike Oesterling
Executive Director, Shellfish Growers of Virginia

19 OCT 2021
Date

Katie Register
Executive Director, Clean Virginia Waterways

10-7-2021
Date

Laura McKay
Manager, Virginia Coastal Zone Management Program

10-19-21
Date

Derelict Clam Net Reporting Form

Please email forms to: Katie Register, Executive Director, Clean Virginia Waterways of Longwood University at www.cleanva@Longwood.edu

DATE	GPS Location	Dimensions of Net (length, height and depth of net mass in feet/inches)	Color of Net	Notes

Appendix V: Monitoring Balloon-related Litter

Surveys were conducted on Fisherman Island National Wildlife Refuge on October 27, 2020, April 2, 2021, and August 8, 2021as part of this grant. Below are all the raw data (aggregated). Items in purple are not including in the ranking since the origin of the debris item cannot be determined. For example, foam plastic pieces (expanded polystyrene) could come from cups, plates, floats, buoys, coolers, insulation, etc.

Rank	Debris Item	Count
Not ranked	foam pieces	1442
1	Balloon-related litter (balloons, ribbons, attachments)	738
Not ranked	plastic pieces (hard)	546
2	bottles beverage plastic	477
3	construction materials	296
4	Clam nets	283
5	rope pieces	142
6	bottle caps plastic	133
7	bottles beverage glass	119
8	buoys, floats	99
9	food wrappers	97
10	cans beverage (metal)	86
Not ranked	plastic pieces (film)	74
11	shotgun wad	66
12	food containers (hard plastic)	47
13	bags (plastic other)	45
14	cups & plates plastic	44
15	fishing lures, light sticks	43
16	shotgun shell	39
17	lids (plastic)	37
18	toys	31
19 (tie)	bottles other (oil, lube, bleach, etc.)	28
19 (tie)	cups & plates foam	28
20	packaging (other plastic/foam)	26
21	fishing net & pieces	24

22 (tie)	cigarette lighters	21
22 (tie)	tobacco packaging	21
22 (tie)	Attachments (other than ribbons)	21
23 (tie)	clothing/shoes	20
23 (tie)	glass pieces	20
24	strapping bands	19
25	fishing pots & traps	13
26 (tie)	cups & plates paper	12
26 (tie)	PPE (Masks and gloves	12
27	cans other (metal)	11
28 (tie)	cigar tips	10
28 (tie)	metal fragments	10
29 (tie)	straws/stirrers	10
30	cigarette butts	9
31	tennis ball	7
32	lightbulbs	6
33 (tie)	bottle caps metal	4
33 (tie)	fishing line	4
33 (tie)	personal products (condoms, diapers, tampons.)	4
323 (tie)	take out containers	4
34	fireworks	3
35	bags (plastic grocery)	2
36 (tie)	utensils (forks, knives, spoons)	1
36 (tie)	weather balloons	1
	bags (paper)	0
	k-cups	0
	medical waste (syringes, etc.)	0
	tires	0