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The Ice Cream Scoop Trawl:

A Marine Plastics Monitoring Device

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Executive Summary

Statement of Problem

The increasing manufacture and use of plastics in our lives results in an increasing presence of these materials in the ocean environment. This negatively affects marine ecosystems because plastics are a choking hazard for the wildlife, and as plastics breakdown they enter the food chain, impacting both aquatic organisms and humans with their toxic chemicals (Barnes, Galgani, Thompson & Morton, 2009). Current environmental education in the Newfoundland school system is limited to recycling and the planting of plants and trees in the school yard. At the time of this report, only one high school course addresses marine plastics, additionally, this course is not a required course for high school graduation.

The making and use of the Ice Cream Scoop Trawl engages children with the marine environment and allows them to see the presence of plastics in the ocean. Research has found that learning attitudes and values related to environmental conservation is important in young children to promote action (Cutter-Mackenzie & Edwards, 2014). Further, children as active participants in citizen science contributes not only to a fuller understanding of environmental issues for the child but also supplies additional scientific data and involvement, valuable to researchers and the general population (Miczajka, Klein & Pufal, 2015).

Methodology

An ice cream container is modified so that water can pass through it and fitted with a handle so that a child can pull it through water. The trawl features two types of mesh, one larger to prevent large debris from passing through, and on the further end, a finer, screen mesh to prevent collected samples from escaping. Reused, affordable and readily available materials are used in its design, to prevent cost barriers for individuals interested in building their own technology. Additionally, its affordability may be an attractive feature to organizations such as summer camps, schools, environmental awareness programs, who wish to incorporate the Ice Cream Scoop into their curriculum. The trawl is used to test for presence of marine plastics at the water's surface. The technology is suitable for Newfoundland's water and coastal conditions, providing the user uses discretion and safe practices, gauging weather conditions before entering bodies of water to use the trawl.

Main Findings and Results

The Ice Cream Scoop Trawl has proven effective in catching and retaining floating marine plastics. The use of fine screen mesh results in the scoop's ability to catch small marine plastics which are visible to the naked eye and illustrate the presence of plastics while educating children. The Ice Cream Scoop Trawl was successful in gathering samples, including various sized plastics and other human made materials during three separate outings between November 11th and 29th, 2015. These outings included testing in a pond, located in an urban area; an access point between a river and the Atlantic; and a barachois and beach located in Topsail, Conception Bay South. On two of these outings, the Ice Cream Scoop Trawl managed to collect a combination of human made objects, including plastics. In addition, there were numerous plastic and other human made objects visible in the water and its surroundings on all three outings. However, while the Ice Cream Scoop is effective, further modification may increase what is caught providing greater potential for environmental learning. A protocol to prevent plastics from washing back out into the marine environment would also be beneficial.

The Ice Cream Scoop Trawl: A Marine Plastics Monitoring Device

Recent advances in science and technology have brought unprecedented changes to the earth's natural systems (Birdsall, 2013). The longest lasting change to the earth's surface to date is the accumulation and fragmentation of plastic debris (Barnes, Galgani, Thompson & Morton, 2009). Plastics are inexpensive materials which are used often in the manufacture of various items. Many of these plastics end up in our oceans, and they can last thousands of years (Barnes et al., 2009). The presence of so many plastics has harmful effects on the ecosystem.

Plastics that enter the ocean are a danger to wildlife. They are capable of choking organisms and distributing harmful organisms (Barnes et al., 2009). Also, they are eventually broken down into small pieces called microplastics that are ingested by small organisms such as fish (Barnes et al., 2009). The toxic chemicals within them are carried up the food chain and are consumed by humans (Barnes et al., 2009). Clearly, this is something humans need to be concerned about. Humans are the cause of these problems, but the good news is, this means we are also the solution (Barnes et al., 2009).

Many people do not know how much of an impact plastics are having on our environment. Furthermore, the public is distrustful of science (Birdsall, 2013). They are not able to engage in debates about scientific knowledge because of the hierarchical structure of the scientific community (Birdsall, 2013). Professionals in the field are highly trained in their respective fields and assert a cultural dominance over the citizens of society (Birdsall, 2013). This is an unfortunate truth because the public working with the experts has the opportunity for valuable learning experiences that can contribute to current knowledge and lead to action (Miczajka, Klein & Pufal, 2015). Citizen science - the scientific efforts of people not formally trained in the sciences - has been invaluable for many past research projects, including the monitoring of coral reefs to assess the effects of environmental change, for example (Branchini et al., 2015). There is no reason why citizen science would not be of great help for the plastics problem as well.

To address the problems of marine plastics and public ignorance, we created an educational tool geared towards children; the Ice Cream Scoop Trawl. This is a simple technology that children can help make, and then use it to learn about marine plastics. They can even participate in citizen science and provide data for larger scientific projects because the simplicity of the Ice Cream Scoop Trawl does not require any highly sophisticated skills (Miczajka, Klein & Pufal, 2015). Research has shown that developing attitudes and values about environmental sustainability is vital at an early age (Cutter-Mackenzie & Edwards, 2014). Children who learn about the harmful effects of human actions on the environment are more likely to take action to reduce these effects throughout their lives (Cutter-Mackenzie & Edwards, 2014). The current educational curriculum in Newfoundland and Labrador does not sufficiently teach the dangers surrounding marine plastics. Only one course touches on the subject - a high school Earth Sciences course which is only taken by a minority of students. We hope that our project can help bring about awareness by making the information accessible to a large audience of children and provide them with a meaningful learning experience.

Detailed Methods

Materials

Empty Ice Cream container (lid is not needed)

Skipping rope

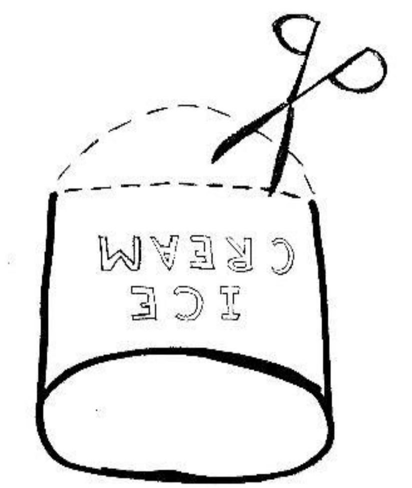
Old shoelaces - colored ones look cool

12 inch square pieces of mesh that have different size holes. We used chicken coop mesh and plastic screen door mesh. You could use pieces of old fishing nets, plastic snow fencing or old hockey nets instead of chicken coop mesh.

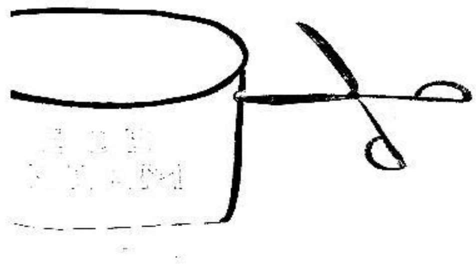
Wire Cutter

Scissors

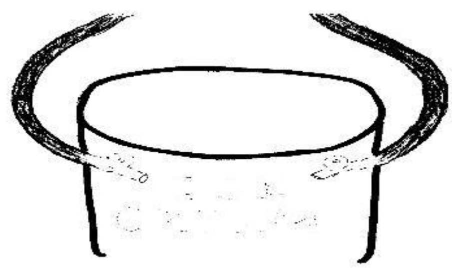
How to make an Ice Cream Scoop



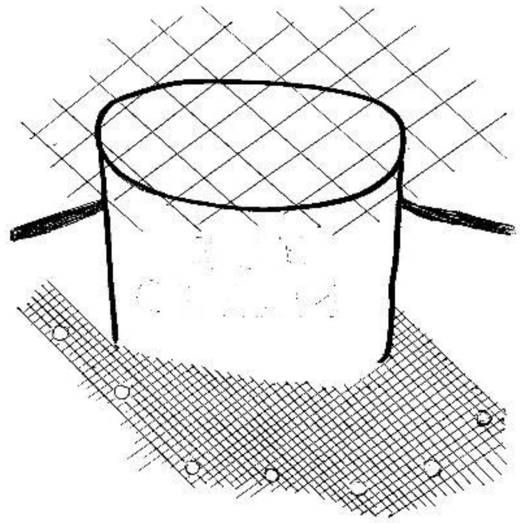
Step 1. Cut out the bottom of your ice cream container with scissors.



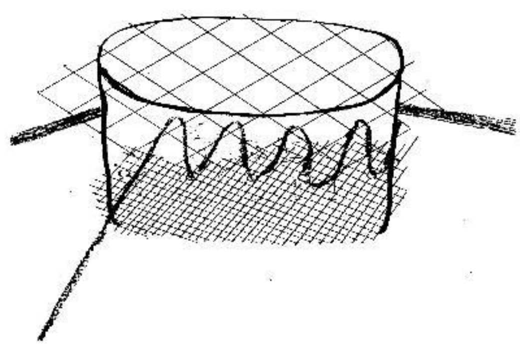
Step 2. Punch 2 holes on opposite sides of the container close to the wider end of the container with scissors.



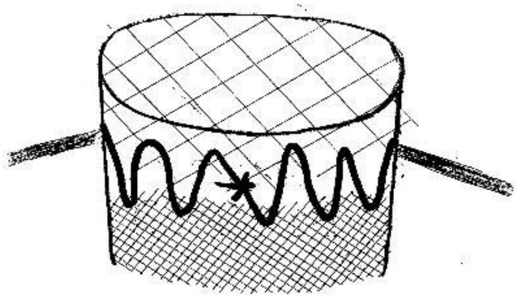
Step 3. Pass one end of the skipping rope through the punched holes in the container and then tie a knot on the inside. Do the same on the other side.



Step 4. Cut holes the size of the shoe lace tip all the way around the finer mesh about a inch apart. Sit the container on the fine mesh and lay the larger mesh on top.



Step 5. Using the shoelace 'sew' the screen mesh to the coop mesh starting at one side and then up to the opposite mesh and back down to the first mesh.



Step 6. When you made it all the way around the ice cream container tie the ends of the shoe laces together. Congratulations- you have now made an Ice Cream Scoop.

Protocol

The Ice Cream Scoop is designed to be used by interested individuals, both adults and children and does not require prior knowledge of science or sampling. It is created using a combination of affordable and reused materials as an accessible way of creating a marine plastics monitoring device. Users of the scoop pull or tow the scoop behind the user, in an effort to discover if there are marine plastics present in the area being tested.

The Ice Cream Scoop appeals to children who may use it as a learning toy, similar to how butterfly nets are used. Its name and colorful construction may invite use by children as a way of introducing an understanding of marine plastics and their effects to a young audience. This approach is meant to encourage an understanding of marine plastics, its causes and implications to children in a learning environment.

Its aim is also to allow children to see themselves as valuable contributors of scientific knowledge through citizen science. Children as citizen science participants assists both the participant and scientific knowledge itself, by focusing on co-education, experiential learning and higher amounts of data (Miczajka, Klein & Pufal, 2015). Further, its introduction to children as a learning experience and as fun increases the exposure to scientific involvement and knowledge base of marine plastics in younger generations.

The Ice Cream Scoop uses presence sampling to identify whether there are in fact plastics in a specific water area, it is not intended to provide information on the quantity of plastics in the water nor give an impression of the presence of plastics across a larger area such as an entire beach or bay. It's designed to be pulled across the water's surface to gather ocean plastics. By acting as a monitoring device for surface water, the technology is intentionally designed not to disrupt ocean floor life or habitat. Since macro debris plastics are dense at the water's surface (as well as the sea floor; Ryan, Moore, van Franeker, & Moloney, 2009), the aim is to maintain the scoop's use at the surface rather than midway between seafloor and surface.

How to use the Ice Cream Scoop Trawl

Enter a shallow area of water and lower the scoop into the water in a sideways position. Using the skipping rope handle to pull the scoop, begin walking with the scoop following behind you. This towing can be done in intervals, ensuring to remove the scoop from the water so any collected materials can be observed and removed from the trawl if plastics are present and stored for analysis. The scoop can then be re-submerged in the water and pulled again, this time pulling in the opposite direction, to avoid tow direction bias (Lippiatt, Opfer, & Arthur, 2013).

The Ice Cream Scoop is likely to be used in public locations and may present an opportunity to discuss the technology and its purpose with locals. Users can encourage discussion by asking locals what they know about the area and about ocean plastics. Information can be provided to locals in the form of flyers to share building instructions with others, see Appendix A for an example of the flyer used by the Dairy Queens.

Sampling Protocol

If samples are collected, they can be transferred from the scoop into labelled resealable bags on site and stored to be examined in an interior location. By analyzing the samples at an interior site is a proactive measure intended to protect from effects of sunlight, wind or rain on the samples. Once analysis has begun, samples need to be separated initially into two categories: ocean based such as plant debris, leaves and other organic matter and consumer based, items created by humans, a by-product of human use (Zhang, 2007). Once separated, ocean based matter can be disposed of, while consumer based samples can be separated into two further categories. These two categories are plastic and non-plastic, any samples which are unable to be classified by visual analysis can be placed under a microscope to determine its material. Plastic samples can then be stored in a clean plastic sealed jar, or another clean resealable bag. The jar must be labelled and include date of collection, location and where users can locate field notes from that collection date.

Samples can be photographed and categorized by size: Macro-Debris (>2.5cm), Meso (5mm-25.cm), Micro-Debris (≤5mm) (Lippiatt, Opfer, & Arthur, 2013).

Photographs of samples can be shared via Dairy Queens' email: dairy_queens@yahoo.ca & Civic Laboratory Flickr page.

Feminist Technology

Before attempting to visualise what a feminist technology looks like, definitions of both feminism and technology must be established. Feminism can be defined as the idea of challenging inequitable power among all social conditions such as race, age, class, ethnicity, and sexual orientation. In order for a technology to be feminist, it must encompass feminist attributes into goals, design, production, usage, and accessibility of the technology. Technology, within the context of this report, is an information source in the form of a marine plastic monitoring device. A feminist technology, then, encompasses knowledge as a resource of and for the people who create, hold and share it. Furthermore, it balances a relationship between inequality and information technology. Similar to Eubanks (2011), we wanted the means (methods) and ends (product) of our technology to be feminist.

There are various aspects of our technology which account for built-in feminist attributes. Primarily, our technology is open sourced. Through a creative commons licence, our technology is accessible to be hacked by future users. This attribute challenges the power dynamic by allowing future users to make any alterations to the technology based on individual needs, or to improve functionality of the technology.

The materials used to build our technology were both accessible and affordable. Choosing materials that are easily accessible and at a low cost is not exclusory to individuals from a low social class in terms of building their own Ice Cream Scoop. Additionally, since our target audience is young individuals, we wanted to ensure that it was possible for people of all ages to have access to the materials we used, or adopt an alternative for a material that might be more challenging to utilize or obtain. We used an old ice cream container, a skipping rope, hockey tape, chicken wire (which could be replaced with an old hockey net), an old shoelace, and screen mesh.

A flyer was created which included the date and time of the testing procedure, and was distributed throughout several convenience stores within a five kilometer radius of our testing site. The prototype can be found in Appendix A. Eubanks (2011) illuminates the issue of excessive reliance on fair distribution as the primary route to justice. This perpetuating distributed paradigm is caused by overemphasis on fair division, while ignoring other social values and obscuring the role of institutional context and social structure. Additionally, materials required to build the scoop are disclosed on the flyer, along with a how-to procedure. The purpose of showing how things are assembled is not to dismantle things, as Bellacasa (2010) points out, nor undermine the reality of matters of fact with critical suspicion about the powerful (human) interests they might reflect and convey. Instead, it is to exhibit the concerns that attach and hold together matters of fact to enrich and affirm their reality by adding further articulations.

Our technology was built on the principle of care, which Bellacasa (2010) emphasizes the importance of. Understanding care as something we do extends a vision of care as an ethically and politically charged practice, one that has been at the forefront of feminist concern with devalued labours. Care must be given to every technology in order to remain responsible for their becoming (Bellacasa, 2010). We embedded care into our technology in two ways. The first was transporting repair tools and extra materials such as an extra skipping rope, more hockey tape, and a square foot size cut out of chicken wire and mesh on each of the group's outings. In the case of our technology being damaged by the turmoil of currents, we wanted to ensure any repairs could be made to preserve the livelihood of our technology. Domestic labours are labours of care, not reproductive natural mediations but productive doings that support liveable relationalities (Bellacasa, 2011). The second way our technology incorporates care is how we stored the technology while not in use. The entire contents of the technology fit inside a medium-sized reusable shopping bag. This prevents any gathered micro plastics from exiting the technology while being transported. This type of care rests in the protection and sustainability of the environment in which the testing procedure was held. It is important to not only care for the technology but the habitat where the testing procedure takes place.

Feminist research methods, pointed out by Brisolara et al. (2014), may be used in service of the problem-focused nature of feminist research. Thus, it can be noted that raising awareness of the problem of marine plastics in abundance, and the lack of education within the schooling system are the primary focuses of this project. While feminism can be baked in a technology in the form of inclusivity, the intrinsic form of feminism here is to allow for a technology to be problem-posing as opposed to problem-solving. Ensuring a technology is feminist encompasses much more than focusing on equity as remedying perceived citizen deficits. It includes a model of "high-tech" equity based on resisting oppression, acknowledging differences as a resource, and fostering demographic and participatory decision making.

Findings

Our findings were collected from three separate outings between November 11th and 29th. The sites are located in different areas of the Avalon Peninsula. Our initial testing site was Mundy Pond, located in St. John's centre, surrounded by a popular walking trail. The findings from this outing are not included since they yielded only water based materials such as bugs and grass, despite plastics between visible in the area surrounding the water. The subsequent outing was in an area of Quidi Vidi known as 'the Gut', where a river outflow from Quidi Vidi Lake meets the Atlantic Ocean. Our third outing was at Topsail Beach in Topsail, Conception Bay South. During this outing, samples were taken from both the barachois and the beach itself. Note that the findings, all of which were found in Topsail beach itself, not the barachois, were photographed on paper with 1 inch (2.5cm) squares.

Quidi Vidi Gut

The scoop retrieved 3 pieces of fishing line and a portion of a cigarette package at Quidi Vidi gut. Located on the right of Fig. 1 is the remnants of the cigarette package, to the left are pieces of fishing line that had been entangled in ocean matter. Also found was a smaller unidentified piece of material was found, possibly a chip of paint. With the exception of the cigarette package which was a macro debris (>2.5cm), the fishing line and possible paint chip were meso debris (5mm-2.5cm)

Figure 1. Samples from Quidi Vidi

Topsail Beach

Aside from a large number of fine rock and sand (not photographed), the scoop retrieved the following pieces of plastic at Topsail beach, all of which were meso and macro debris.

Curled plastic similar to dental floss (but larger)

Blue piece of plastic from the neck of a bottle

Styrofoam wrapped plastic line

Another piece of Styrofoam

White plastic with unidentified origin,

Green beach glass- possible origin: glass bottle

It is worth noting that when the samples were collected, it was a windy day with rough waters. The scoop collected many various sized beach rock which were lifted from the seafloor and moved through the waves near the shore. This is likely how a weighted item such as the green glass was collected.

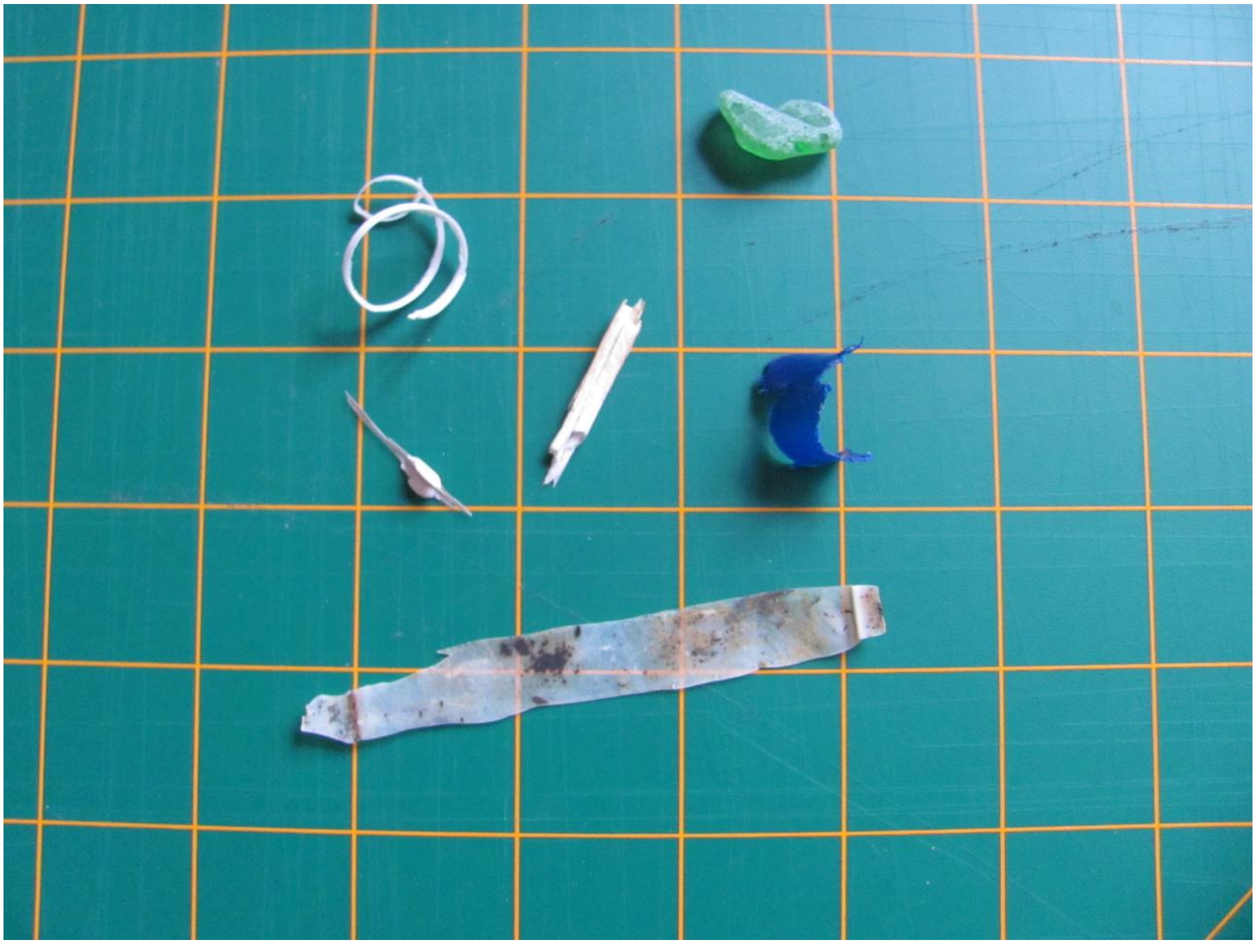


Figure 2. Samples from Topsail Beach

Discussion

As previously stated, our technology successfully collected samples at all testing sites. Despite this, further alterations could be made to improve functionality and to be better suited to the intended users. However, the technology has its own set of limitations which include along with suggestions for future alterations.

Due to the buoyancy of our technology, the Ice Cream Scoop has only been able to collect plastics on the surface of the water, or those that have been disturbed by a current or wave. The technology has not successfully collected any plastics at the bottom of a body of still water. For this, the Ice Cream Scoop is better suited for any body of water that has a current, or movement (i.e. river, ocean). Securing a broom stick (or any slender, stiff object) to either side where the skipping rope was attached would allow the user to apply sufficient vertical pressure to the apparatus to capture plastics that have sunk to the bottom.

During our unadvertised Mundy Pond trial testing, we were approached by one individual. However, on the day of our advertised testing procedure on Topsail Beach, no individual attended. We think this is due to unfavourable circumstances including the time of year, and weather, which allowed for Topsail Beach to naturally not have as many attendees. Since conversation is a major portion of our project, attendance at the testing site is crucial. If this technology were to be deployed during a warmer time of year, we think that children would be more inclined to attend the event, or inevitably be at the seasonal venue.

During our testing procedures, it was noted that we did not encounter any organisms big enough that would have otherwise been rejected by the front mesh (chicken wire). Because of this, having the front mesh is an unnecessary addition to the functionality of the technology. Additionally, the absence of front mesh may account for the sampling of larger (macro) plastics.

Plastic samples were not extracted from the technology between each sampling trial, which allowed for the contents to potentially exit the technology. To ensure any and all plastics are accounted for, tweezers and hands free reusable container should be brought on site. The tweezers would extract plastics from the technology, and the hands free storage system such as a container stored inside a fanny-pack store plastic samples.

Conclusion

The continuing and increasing manufacture and use of plastics negatively affects marine ecosystems through bio-magnification (plastic volume increasing as it is consumed by organisms along the food chain). Existing literature has reiterated the importance of educating individuals of this issue as early as possible in a participatory, meaningful way.

The making and use of the Ice Cream Scoop incorporates an educational insight to the existence of marine plastics; while allowing children to be participants in citizen science. Thus, value to researchers and our society is given. Our technology not only has the potential to ignite awareness by making the information accessible to all ages; but it provides the public with a meaningful learning experience.

Research and other marine plastic monitoring devices are an essential component in addressing the issue of marine plastics. Monitoring the abundance of debris is important to establish rates of accumulation and the effectiveness of any remediation measures. Further research in this area will be needed to establish the full environmental relevance of plastics in the transport of contaminants to organisms living in the natural environment, and the extent to which these chemicals could then be transported along food chains.

Acknowledgements

The Dairy Queens would like to acknowledge the Department of Sociology, Memorial University for funding the purchase of materials required to build the Ice Cream Scoop Trawl.

Uncle Herb- for the loaning the group hip waders.

The Eco-Trawl, Feminist Technologies Winter 2015 group for the inspiration to design a trawl which intentionally does not disrupt seafloor life.

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Appendix A

Flyer for Public Distribution

Appendix B

How to Build an Ice Cream Scoop for Public Distribution

Child version

You will need the help of one adult.

Required Materials:

Empty Ice Cream Container (Lid is not needed).

Skipping rope

Old shoelaces - colored ones look cool

12 inch square pieces of Mesh that have different size holes. We used chicken coop mesh and plastic screen door mesh. You could use pieces of old fishing nets, plastic snow fencing or old hockey nets instead of chicken coop mesh.

Tools required:

Wire Cutter

Stanley knife

Scissors

Step 1. Get an adult to cut out the bottom of your ice cream container with Stanley knife..

Step 2. Punch small holes big enough for shoelace to pass through in plastic door mesh

Get the adult to punch holes on opposite side of the bucket

Step 3. Get the adult to shape the chicken coop mesh over the top the bucket

Step 4. Using the shoelace ‘sew’ the mesh to the coop mesh starting at one side and then up to the opposite mesh and back down to the first mesh See Diagram

Step 5. When you made it all the way around the ice cream container tie the ends of the shoe laces together.

Step 6. Pass one end of the skipping rope through the container and then knot them on the inside. Do the same on the other side. You now should have a handle to pull your container through the water.

Congratulations you have made an Ice Cream Trawl!

You MUST have an adult go with you to the pond or beach to use your trawl.

Pull your trawl through the water and see what you catch! If you catch any fish let them back into the water.

Appendix C

Field Notes

Dairy Queens Work meeting

November 11th 2015 @ 12:00

Present: Heather, Kate, Kristen and Maire

Duties assigned:

Maire Note taker.

Kristen photo documented the process

Heather and Kate primary builders

Review of Materials Gathered:

Chicken Coop 1 inch Mesh,

Plastic screen door mesh

Ice Cream Containers

Broom handles

Wire

Plastic Ties, Shoelaces

Screws, nails

Tools gathered

Wire cutters, Hammer, Scissors.

Proposed method 1:

Step 1. Cut out the bottom of your ice cream container with Stanley knife.

Step 2. Punch 2 holes on opposite sides of the container close to the wider end of the container.

Step 3. Shape the chicken coop mesh over the top the container.

Step 4. Place container on plastic screen mesh and centre it. You may want to trim off corners of mesh so that it looks more like an octagon and make the next step easier.

Step 5. Using the galvanised wire 'sew' the plastic mesh to the coop mesh starting at one side and then up to the opposite mesh and back down to the first mesh in a zigzag fashion.

Step 6. Make handle with broom handle.

Proposed method tried and need for work gloves and bandages quickly identified as a need when working with wire. Same obtained from household supply.

Discussion held re handle and broom handle placed into another ice cream container for consideration. Decided same would be too long for a child to use. Small wire handle placed in prototype for testing. Skipping rope decided as a viable option especially for children.

Prototype made and tested in bathtub which was half filled with water and small pieces of plastic.

Plastic was a mixture of plastic straws cut up into 5mm to 6 cm lengths and odd shaped slivers of ice cream container lid no longer than 10 cm and no wider than 1 cm.

Prototype collected plastics from water. Plastics noted to float on the water and therefore easy to scoop. Plastic also got caught on outside of mesh also.

Prototype method 2:

Step 1. Cut out the bottom of your ice cream container with Stanley knife..

Step 2. Punch 2 holes on opposite sides of the container close to the wider end of the container.

Step 3. Shape the chicken coop mesh over the top the container.

Step 4. Place container on plastic screen mesh and centre it. You may want to trim off corners of mesh so that it looks more like an octagon and make the next step easier.

Step 5. Using the shoe laces 'sew' the plastic mesh to the coop mesh starting at one side and then up to the opposite mesh and back down to the first mesh in a zigzag fashion.

Step 6: Using skipping rope, unscrew handles, undo knots at either end and feed through holes in sides of containers and knot on inside. Depending on skipping rope model the handle may be able to be screwed back together as in our case.

Step 7. Kate took prototype home to decorate with bright tape and to secure ends of wire to avoid skin tears.

Meeting concluded at 2:00pm

Field Test of Ice Cream Trawl at Mundy Pond November 21st.

Present: All members of the Dairy Queens.

Mundy Pond is located in the central area of the city and has a river flowing in at its west end and flows out at the east end. It is bordered by a 2 km walking trail and had ducks, swans and this year these swans had 4 cygnets to the surprise of city staff. The city of St. John's has a metal barrier in front of the outflow at the east end which is then culverted underground with additional mesh across the lower end of the culvert which had a dead duck, candy wrappers and a lifestyles condom package caught. It was noted that the long grass nearby had cans, drink containers, Tim Horton wrappers etc. caught in it.

12:00

Queen Kate entered the pond and walked westward pulling trawl. Trawl did not float and once the current got hold of it the trawl was operational at surface level.

Initial haul was grass seeds as grass grow in the water of the pond at its edge and one unidentified brown insect- grasshopper like

Skipping rope handle held up and did not prevent trawl from being controlled.

Hockey decorative tape held up.

12:20

Queen Kate entered the pond again with the mud now stirred up and used trawl again and results were the same.

She noted a bike tire at bottom of the pond. The sample was examined and the only new item was a white curled piece which was determined to be a small plant with root and white stem. All samples returned to the pond environs.

Queen Heather was approached by a woman walking the trail and Heather explained that we were testing out something to catch plastics. This person noted that plastics last too long and enter the water. She noted that a cleanup is done every spring and she noted lots of small fish ‘breaching’ in the pond last summer. She thought that people should be hired to clean it up (plastics).

The City of St. John’s staff do clean up garbage, have been seen picking up garbage with pick up sticks and feeding the swans. Local people feed the ducks. There are garbage cans around the pond

Plan: Field Test in Marine Environment at Quidi Vidi Gut with class on Monday November 23rd.

Meeting concluded 12:45 pm.

Report on Quidi Vidi Test

Group Members Present: Heather, Kate, Kristen

The shoe lace appeared a little loose and was tightened. Heather and Kate entered the water near the shore in the Gut, the trawl was pulled by both members for varying intervals, organic materials were collected. Photographs were taken.

The group then moved to an area at the end of the river entering the gut, alongside a large wharf. In this area, the scoop collected human made and organic materials combined. Samples remained in the scoop, which was stored within a clean reusable bag and separated and stored in a glass jar at a later time.

Report on Topsail Beach

Topsail Beach November 29th at 12:00pm

Topsail beach is located in the municipal area of Conception Bay South (CBS) which spans community around the lower eastern side of Conception Bay from Topsail to Kelligrews. The beach starts with a cliff at its eastern end and extends westward for several kilometers. It is a stony beach and has no sandy stretches.

Sewage treatment plant is located at Cronin's Head in Kelligrews and if a home is not connected to the town, a septic tank is required. Thus sewage related items found on Topsail beach do not originate from this area. Nearby Bell Island is the most likely source as it does not have wastewater treatment plant and it was granted municipal funding in 2013 for sewer outfall rehabilitation. (Newfoundland and Labrador Department of Environment and Conservation, 2014; Newfoundland and Labrador Department of Municipal and Intergovernmental Affairs, 2014). Only newer homes have septic tanks.

The day was cold and windy with flurries and low attendance. The date also conflicted with the annual Santa Claus parade in nearby St. John's.

The trawl was used in the barachois that is inland from the beach and in the ocean. The ocean surf was high and the shoreline was being churned up. Hence we collected much gravel and small pebbles along with plastics and a piece of beach glass.