2022-2023 Microplastics Monitoring Sample Procedures

INTRODUCTION

Every scientific study starts with asking a question. In this monitoring study, the broad question we are asking is:

When and where are microplastics found along the New Jersey shore?

The main goals are:

1. To begin to observe when and where microplastics congregate along the Jersey shore.
2. To provide an opportunity for community members to engage with science.
3. To create an educational activity about microplastics.

Definitions:

Microplastics: For this study, microplastics will be considered any small plastic piece you see with your naked eye that winds up on the top of your sieve, but approximately 5mm in diameter (but a bit larger is also good).

Scoop: Each scoop should be about 1 cup. Please use a 1-cup measuring cup if possible. When scooping sand, please stay near the surface of the sand.

Meter Square: Outline of a 1-meter by 1-meter square used to designate a sample area. You can create your own meter square, use a meter stick, measuring tape, or a rope cut to a meter, and mark corners of a meter square in the sand. We suggest building a meter square you can pick up and carry. This is probably the most time-effective way to sample.

Sieve: A tool used to separate sand from microplastics. We recommend using a sieve with openings around 2mm in order to catch as many microplastics as possible while allowing them to be visible to the naked eye (about size 10 mesh). A standard window screen has approximately 1.4mm openings so an up-cycled window screen works perfectly.

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MATERIALS

In order to keep this project accessible and less resource-intensive, we encourage you to get creative and reuse what you already own as the materials needed. For example, you can make your own sifter using an old window screen or a colander. You can repurpose sauce or peanut butter jars for collection containers. It's okay to think outside of the box and use what works for you! Each volunteer's materials will be a little different, and that's okay for this particular study. We hope to use what we learn from the first few years of this study to inform best practices for future microplastic community science programs. Please give us any feedback about materials that worked or didn't work used for sample collection!

MATERIALS LIST

- 9 containers for samples
- Writing utensil
- Tape
- 1-meter square (or meter stick)
- 1-cup measuring cup
- 1 sieve (approx. 2mm mesh)
- Gloves (if needed)
- A friend or family member!

WHEN

Sampling occurs 4 times in one calendar year. Each sample season will last approximately 2 weeks. The start date of each sampling season is approximately the first day of each season (Winter, Spring, Summer, Fall).

Volunteers (that's you!) pick one day within this two-week period to complete sampling The time you choose to go out sampling should be as close to low tide as possible.

2022 - 2023 *Sample Season Dates:*

- Winter 2022: December 30 - January 15 2023
- Spring 2023: March 17 2022 - April 2 2023
- Summer 2023: June 16 2023 - July 2 2023
- Fall 2023: September 22 2023 - October 8 2023

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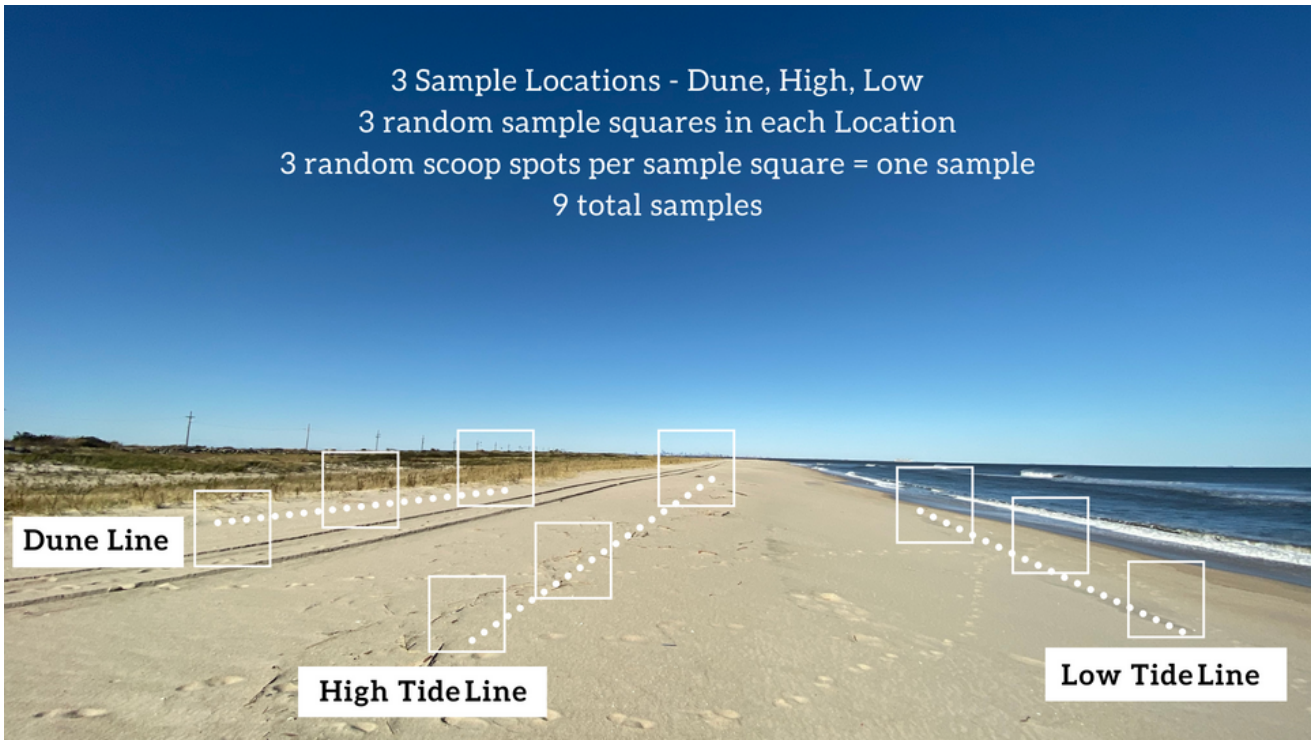
WHERE

Your favorite beach! There are no specific places around NJ we recommend, simply choose a location that is accessible and meaningful to you. If you have sampled with us before, you can keep sampling the same location. Make sure to note the beach name, town, and GPS coordinates of your sample location on the date sheet. At your beach, there will be 3 sample locations - the **Dune Line,** the **High Tide Line**, and the **Low Tide Line** (see *image below).*

Sample Locations:

- **Dune Line** - right on the line where the dune slope stops within dune vegetation, if applicable. If there are no vegetated dunes, sample at the back end of the beach furthest from water.
- **High Tide Line** - during low tide this should be marked with a wrack line, discoloration of the sand, or a change in the way the beach is sloping towards the water.
- **Low Tide Line** - point where water comes up on the shore during low tide. If the sand is wet, sample the dry area as close to the low tide line as possible.



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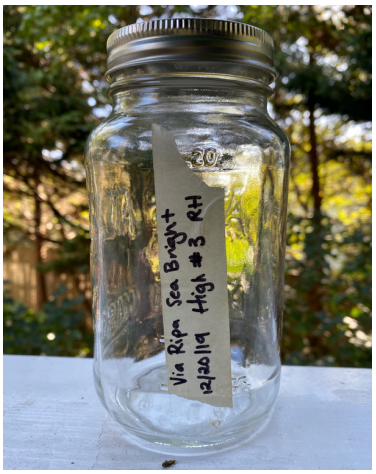
HOW

Plan to take the sample during low tide at your beach of choice. Before or during sampling, please complete the ***Sampling Datasheet***, which can be found on our website or Google Classroom. During sampling remember to dress accordingly, take some photos and have fun!

Taking the sample:

1. Start at the low tide line. Place meter square down on the sand on the low tide line.
2. Within the square, pick one random spot for the first scoop.
3. Take three scoops from the same spot and scoop them into the sieve (3 cups of sand). Shake sieve inside the meter square. Place all contents that remain on the surface of the sifter into a labeled container, including sand and rocks (see ***How to Label Samples*** or picture to the right).
4. Without moving the meter square, repeat steps 2 & 3 two more times at two new random locations within the square. Empty the contents that remain on the sifter into the SAME container. This is one complete sample. **1 meter square; 3 random spots, 3 scoops per spot, 1 jar = 1 sample.** (Or, 9 total cups of sand, sifted = 1 sample).
5. Take about 5-10 large steps along the tide line and place the meter square down again. Repeat steps 2-4 to get a second sample from the same tide line. These samples are meant to be random so it doesn't have to be an exact distance between meter square locations.
6. Take about 5-10 large steps again and place the meter square down for the third time. Complete steps 2-4 to get a third sample at the low tide line.
7. Repeat steps 1-6 at the high tide line (collecting 3 samples on the high tide line).
8. Repeat steps 1-6 at the dune line (collecting 3 samples on the dune line, 9 samples in total).



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AFTER SAMPLING

After you complete your sampling, microplastics need to be separated from sand and rocks and submitted using the ***Sample Submission Sheet***. This sheet has further instructions. We recommend separating plastics on a white or light background. If you're unsure if a piece is plastic or not, we recommend a "hot needle test" - warming up a needle and touching it to the piece in question. If it melts, it's plastic.

Make note of anything that happened while separating or sampling on your ***Sampling Datasheet***. Datasheets will be submitted using a Google Form that will be sent to volunteers over email and will be on our website (www.plasticwaveproject.com/microplastics).

THANK YOU!

Thank you for choosing to volunteer with the Plastic Wave Project, Save Coastal Wildlife, and Save Barnegat Bay on our microplastics monitoring community science study. We wouldn't be able to do it without you.

Sign up and all documents listed in these methods can be found on www.plasticwaveproject.com/microplastics and Google classroom

If you have questions, please reach out!

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