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FLORIDA

MICROPLASTICS AWARENESS

PROJECT HANDBOOK

UF/IFAS PHOTO BY TYLER JONES

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Introduction

Welcome to the Florida Microplastics Awareness Project (FMAP) handbook! By opening this document, you have begun the process of highlighting this ever growing environmental issue. We created this document to improve access to project resources for extension agents and educators. This resource includes presentation materials, activities, demonstration ideas, educational resources, evaluation methods, and examples of how to put them all together into a program.

The FMAP website serves to raise awareness about microplastics within Florida and engage residents by teaching them how to sample microplastics. The website also serves as a hub for FMAP resources, including the FMAP Pledge, FMAP Volunteer Manual, the series of microplastics sampling training videos, links to additional volunteer and K-12 resources, and a map of all reported data.

Overview and History of Florida Microplastics Awareness Project

The FMAP was created in 2015 by Dr. Maia McGuire from the University of Florida through a National Oceanic and Atmospheric Administration's (NOAA) Marine Debris Program grant. Dr. McGuire developed the FMAP protocols, which are based on methods from Abby Barrows and the Adventure Scientists' Worldwide Microplastics Program, as well as the original FMAP educational materials, training videos, and data management protocols.

In the first decade of the program, volunteers collected water samples from 29 different counties throughout Florida. During this time, over 430 volunteers analyzed their samples for plastic fibers, fragments, microbeads, and film. There were also nearly 1,500 flame test samples to determine the number of pieces of plastic, natural and synthetic fibers, plastic fragments, microbeads, and films.

When to Use the Resources in a Program

There are a variety of resources within this document that you can use in a range of settings, including tabling activities, 4-H camps, presentations, and participatory science.

Did someone ask you to give a presentation on microplastics?

- Save yourself the time of making one yourself and use the microplastics presentation below. It gives an overview of the problem and individual/institutional actions to improve the situation.
    - The microplastics presentation was created by Dr. Anna Braswell's Coastal Ecosystems and Watersheds Lab at the University of Florida. It is associated with a project through the University of Florida, the National Oceanic and Atmospheric Administration, and Florida International University. It discusses two main topics, first defining what microplastics are and then describing how they affect the environment, ecosystems, and humans around the globe. Engagement slides are strategically placed throughout the presentation to ensure that the audience is thinking critically about the topic.
- Play Minnesota Sea Grant's Watershed Game to familiarize your audience on how microplastics can impact different cities and ecosystems, and how to come up with solutions to microplastics issues.

Are you tabling at an event and want a simple, engaging hands-on activity?

- Set up a filter (pre-filter a water sample so there are some microplastics on the filter) underneath a microscope for attendees (see below filtering information).
- Print out the "top 10 trash cards" from the Hands-on Activities for Plastics and Marine Debris Education curriculum and set them up on the table. Ask them: Which have you seen on the beach and what do you think the most common items picked up on our beaches are?
- Set up the Does it Sink or Float activity from the Hands-on Activities for Plastics and Marine Debris Education curriculum. Let attendees conduct a brief experiment while you discuss the types of plastics and how they impact the environment or how they relate to your local recycling program.

Are you doing a 4-H camp or asked to visit a K-12 school group?

- The Hands-on Activities for Plastics and Marine Debris Education curriculum provides a series of activities that can be done individually or together with a range of ages.
- With older students, you can explain the process of filtering microplastics and have them participate in the process then examine the filters under the microscope. You can incorporate collecting samples from various sources to compare.
- Check out the additional K-12 resources linked in the section below.
- You can use the above activities with adult groups as well!

Did someone reach out to you with a question about microplastics?

- In addition to the presentation and other resources in this document, you may also want to read the Marine Microplastics Primer for Extension Professionals, which gives a brief, yet detailed overview of what microplastics are and how they affect ecosystems and humans. This document is useful as it gives extension agents the knowledge needed to answer microplastics questions from the public. If you are stumped - feel free to reach out to us using the contact information at the end of this guide.
- If you have interested clientele in your area, consider starting a microplastics participatory science project and have them regularly sample for microplastics.

Participatory Science Project and Microplastics Filtering

The participatory science aspect of this project is what makes it so successful. Program volunteers gather water samples from across the state, filter them, and examine the samples to determine if various types of microplastics are present. This field based activity also provides a connection between the participants and their local waterbodies. They are also able to educate other interested people about these microplastics, their sources, and issues caused by them.

People reach out to the FMAP with an interest in participating for a range of reasons, including:

- Wanting to volunteer with an established monitoring program to contribute to a wider body of scientific knowledge
- Looking to collect local data to share with their community
- Utilizing the FMAP protocol for educational purposes in a school or environmental center
- Conducting an individual school research project

Extension Agents and FMAP volunteers are welcome to use the materials and protocol for any of these activities. In addition, volunteers are asked to report their data, which go into a main FMAP database and are shared publicly on the FMAP website. They are also asked to report their volunteer hours, whether those are spent collecting and analyzing samples or conducting outreach in their community. This information can be shared with Extension Agents participating with FMAP for annual reporting.

FMAP volunteers collect water samples for microplastics and looking through microplastic samples

There are several resources for both Extension Agents and volunteers to utilize while conducting microplastics filtering and analysis:

- FMAP Volunteer Manual describes the procedures for collecting and analyzing water samples, along with information and images to assist with microplastics identification and a description of the volunteer roles and expectations.

- Training videos demonstrating each step of the water collection, filtration, and analysis process are available on the FMAP website.

- Guide to Microplastics Identification provides additional information and images that volunteers may find useful when identifying the types of microplastics.

Extension Agents are encouraged to perform an in-person filtering and analysis training for new volunteers. This gives them hands-on experience and helps them feel more confident in conducting the process on their own.

FMAP founder Maia McGuire performing a microplastics project demonstration

There are several sets of FMAP supplies located throughout the state of Florida with UF/IFAS Extension Agents and environmental education centers. Check the map of FMAP Project Coordinators to find locations where FMAP supplies are currently located. Some of these organizations may have established programs that volunteers can work with or they may be willing to let educators and students utilize the kits for a period of time. FMAP also has a limited quantity of FMAP kits to provide to Extension Agents who are interested in establishing a participatory science program in their county. Please reach out to the FMAP coordinators if you are interested in obtaining a kit. If those are no longer available or if you would like to purchase your own supplies for a FMAP sampling kit, a supply list is included in Appendix A of this handbook.

Microplastics Adaptations for the Watershed Game

The Watershed Game was created by Minnesota Sea Grant in 2006, with several variations developed in the following years with other Sea Grant and NOAA partners. In this game, participants work in teams to take on the roles of community stakeholders and make land-use decisions to reach a water quality goal.

The issues within the game deal with nonpoint source pollution, such as excess sediment, nitrogen and phosphorus. Microplastics have also become a key type of pollution in our watersheds and should be considered in decision making and policy changes. Microplastic pollution is already represented in each of the Watershed Game models, whether from discarded fishing gear near the coast or plastic mulch films near rivers and streams. In each model, agents are able to tailor their tool cards to make them more microplastics focused. They also can be personalized to the cities in which participants are playing so that they can understand how much microplastics are affecting their local communities. Examples of personalized tool cards for the coast model are available by request to the coordinators. Appendix _____.

There is both a local leader version and a classroom version of this game. The local leader versions include all four models while the classroom version only includes the stream and coast model. Classroom versions are targeted towards younger audiences while the local leader versions could be used for more mature audiences. Local leader versions can also be tailored to the area in which you are presenting in order for participants to envision their own local community.

K-12 resources

Hands-on Activities for Plastics and Marine Debris Education is a series of three activities that can be completed individually or as a set. They can easily be adapted for either informal or classroom educators for a variety of group sizes and grade levels. The activities include:

- Activity #1: Does it Sink or Float?: Students will be introduced to the different types of plastics and will hypothesize whether they think each type will sink or float. They will then test their hypotheses by submerging small pieces of each type of plastic into water and recording whether the plastic sinks or floats.
- Activity #2: Top Trash Types with optional beach cleanup: Students will hypothesize which types of marine debris are found most often during beach cleanups, then compare their hypotheses with data from the International Coastal Cleanup.
- Activity #3: Single-use, Long-term use, Biodegradable Venn Diagram: Students will categorize items as single-use, long-term use, and/or biodegradable and then discuss choices we can make to reduce our use of single-use plastics.

Other Sea Grant activities that are useful and entertaining for a wide variety of students and ages include:

- The Microplastics Awareness Activity is a fun hands-on activity where students will pretend to be a marine animal of their choice and will experience the difficulty of feeding (using tongs) only on their food source (rice) when plastics (lentils) are also present in their environment.
- Sampling for Microplastics in Beach Sand is an activity for upper elementary school students to adults. There are two methods that extension agents can choose to sample depending on how much time they have at the beach. This

activity involves using quadrats to sample in the sand and collecting sediments that will be sieved through to find microplastics.

- The Gulf of America Sea Grant Science Outreach Team created an entire Microplastics Curriculum that allows teachers to discuss the history of microplastics research, the distribution of microplastics concentrations, and differences in sampling techniques with their students. This can be used for a wide age range of students.
- Created by New York Sea Grant, Plastic Pollution and You is a 15 lesson curriculum that discusses anthropogenic threats to the freshwater and marine systems in New York. This has lesson plans that are clearly labeled for different age ranges and grade levels.
- A more artistic option, "Me and Debris" is a play in poetry that gives a theatrical performance about marine debris that lasts about a half an hour. The roles within the play can easily be distributed throughout a classroom as an activity to engage them and recognize the effects of plastic pollution.

There are many more activities available on the microplastics website that could be helpful for any event you plan to hold for microplastics!

Microplastics Awareness Month on Social Media

Maia McGuire created the Microplastics Awareness Month on social media to continue to spread the awareness of microplastics. The entire month of September is dedicated to posting once a day on new information about microplastics, different ways to avoid using microplastics, and examples of microplastics that most people do not think of. There are a few examples of different microplastics memes that Dr. McGuire was able to come up with inspiration for other memes or pictures that might be helpful to post for the month shown in appendix B. This dedicated month of posting can help engage residents in your county and lead to interest in a program.

How to Evaluate these Programs

The main goal of this handbook and the tools within it are to increase awareness of microplastics and cause behavior change within local communities. Below are some examples of simple ways to evaluate and report the impact of your program:

1. Have program participants Take the Pledge to reduce their plastic use. This will allow you to report the number of participants pledging to reduce their plastic use. In the pledge it also gives an option to sign up for a follow-up survey to see how their plastic usage within the pledge has changed over time. The pledge data goes to a Qualtrics form, but we are happy to share those numbers with you and can collect the data from particular events if you give us the time frame.
2. For both youth or adults participating in short educational programs, you can have participants complete a brief post-program self-reflective evaluation to assess knowledge gain. This evaluation is presented to participants at the end of the program and they are asked to evaluate their knowledge on various topics on a Likert scale after the program versus before the program. You can then calculate the knowledge gain through the equation of (post-pre)/post. There is a sample evaluation in Appendix C that you can use or modify. If you prefer, you can develop a pre and post-quiz with specific questions based on the information you present to evaluate knowledge gain.
3. For participants in longer-running programs or with whom you have contact information to follow up with, consider a 6-month follow up survey to ask behavior change questions. There is a sample evaluation in Appendix D that you can use or modify.
4. Make sure that all volunteers participating in microplastics filtering report their data and to report their volunteer hours. You can report on the number of volunteers, the number of sites monitored, and volunteer hours completed annually, translated into the cost benefit of their volunteer time. We are happy to provide this information to you annually.

Contacts and Authors

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Appendix A - List of Filtering Supplies

Below is the list of items needed to perform the microplastics sampling and analysis. The second column includes an embedded link to an example of this item along with the estimated cost as of May 2026. These specific suppliers are not endorsed by FMAP and you may want to shop around online for other options or be able to substitute with similar materials you already have in your office or classroom. If you are purchasing through UF or in bulk there may be other preferred suppliers.

Item	**Estimated cost**
One-liter Nalgene wide-mouth bottles and caps - One per water sample + one for filtered water	$15 each
One glass one-liter filtration flask	$35
One MiltyVac manual vacuum pump with two pieces of clear tubing, in carrying case	$94
One filter holder (2-piece, including rubber stopper and grooved disk)	$85
One box of 100 gridded filters	$34
One sleeve of 25 100mm x 15mm Petri dishes	$10 for 25-pk, more often purchase larger quantities
One pair of fine-pointed tweezers	$6
One pair of filter forceps	$5
One AmScope battery-powered microscope (with rechargeable batteries, AC adapter, and cover)	$222
One wash bottle (500ml)	$10

Estimated cost for one kit $330 without a microscope, $550 including a microscope

Appendix B - Microplastics Awareness Month Memes

Appendix C - Pre/Post Assessment

Post vs pre self-reflective assessment

On a scale of 1 to 5, rate the following statements

1 = Strongly disagree 3 = Do not agree or disagree 5 = Strongly agree

NOW, after attending this program... versus BEFORE I attended this program...

I know about microplastics and how they affect the environment

1 2 3 4 5 1 2 3 4 5

I think that microplastic pollution is an important environmental issue

1 2 3 4 5 1 2 3 4 5

I know ways that I can reduce my plastic use

1 2 3 4 5 1 2 3 4 5

Appendix D - Follow up Survey

Six-month follow-up behavior change survey

Have you adopted any of the following behaviors as a result of your participation in programming with the Florida Microplastics Awareness Project?

	Yes	*No*	*I was already doing this*
I eliminated or reduced use of single-use plastics including bags, water bottles, straws, etc.			
I volunteered time/resources for an organization or cleanup event.			
I began collecting data or participating in citizen science projects.			
I gave written or oral public comment about an environmental issue.			