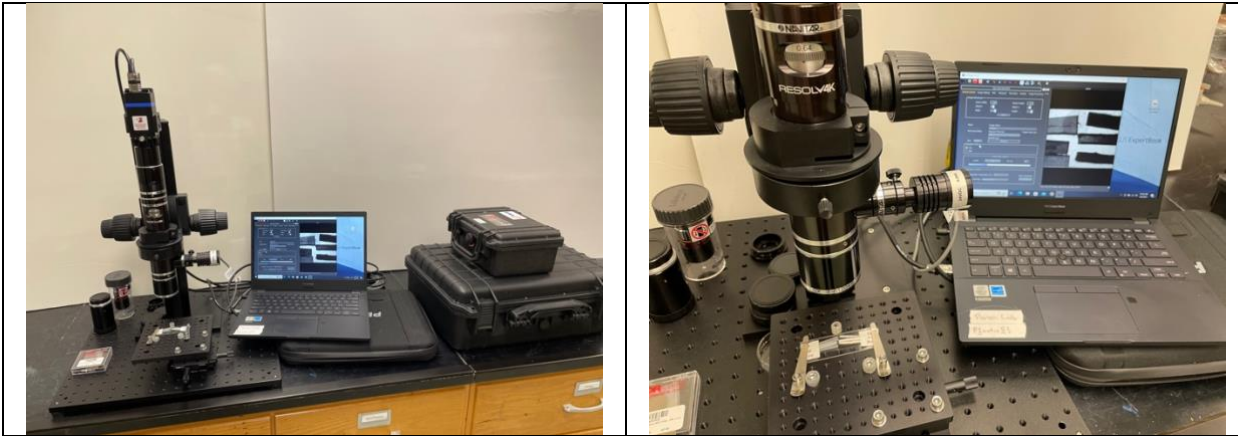


Spring Update – Microplastics Marine Debris Project

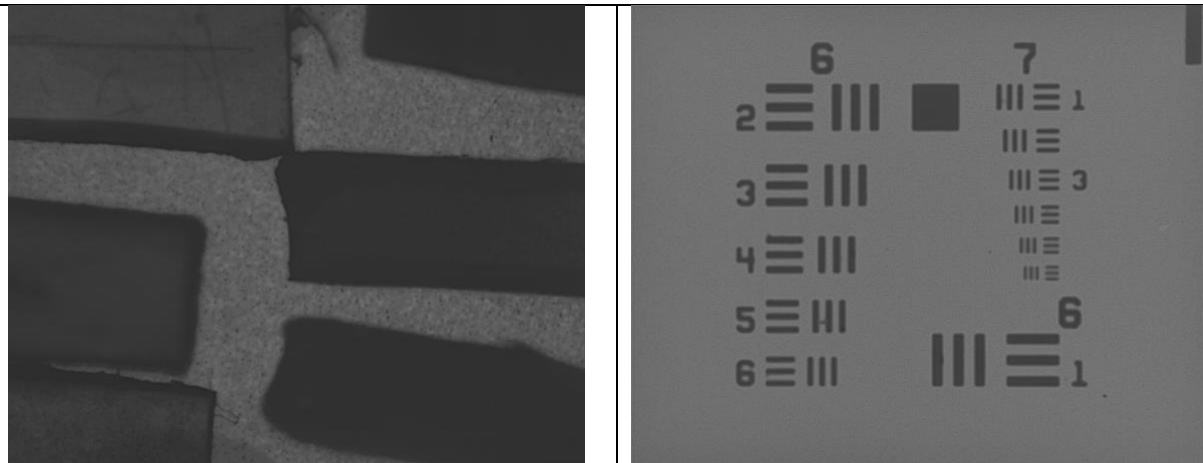
12 May 2023

Hello!

The Short-wave Infrared (SWIR) Microscope is in the Lab! In April we received all the parts for the SWIR microscope, which arrived in 3 boxes, and we immediately (but carefully and methodically) started assembling. In the first day, we were able to get images from the camera onto the computer, and we're going to be working with the company that we purchased the equipment from, Pembroke Instruments, to start the analysis.



The SWIR Microscope! The images above show the whole system with the camera mounted on top of the microscope body, and the computer on the right. Seen on the computer screen is the software that controls the computer and an image of a slide that Jamie made with 6 types of plastic on it. (you can see the slide in the photo on the right). On the left of the microscope itself are additional objective lenses, which will allow us to visualize plastic particles of many sizes, ranging from just a few thousandths of a millimeter up to a centimeter or more!



The images above are samples from the SWIR Microscope as we tested it. On the left is a close up of the slide that Jamie made with six plastic types. These pieces of plastic were taken directly from the types of plastic that we are using in our degradation experiments, and we will use these initial images to train the computer to use the SWIR microscope images to classify different plastic types. The image on the right is from a test image. This is taken at the highest possible magnification, and the width of the smallest lines is about 2 micrometers, or about the size of a large *E. coli* bacteria.



Left photo: Students Kerry Burns and Catherine Fitzgerald collecting samples on the Choptank river.

Right photo: Project co-chair, Jamie Pierson and students winter sampling.

In other news, we were able to get out once this winter to sample the Choptank River at all of our stations for the first time in 2023! We sample in the winter so we can look at plastic concentrations before the marshes and sea grasses start their spring growth spurts. As you can see in the photos, we take safety seriously so that's us in our bright orange work suits, which make us visible and provide flotation in the event we go in the water (no one did!). Also note that we recognize these are made of nylon and polyester, but fortunately the bright colors mean that we should be able to track any contamination from the suits that occurs in our samples. Our cotton lab coats that we wear when processing samples are also dyed bright colors to track any contamination.

We will be continuing to test the microscope this spring and hopefully will be using it to analyze some samples before the summer. We are also planning our spring and summer sampling trips, which will be planned around tides and weather, and will provide us with a fresh batch of samples to hopefully learn about how plastics move through our rivers.

Thank you for your support of this project!

A handwritten signature in blue ink that reads "Jamie Pierson and William Nardin".

Drs. Jamie Pierson and William Nardin