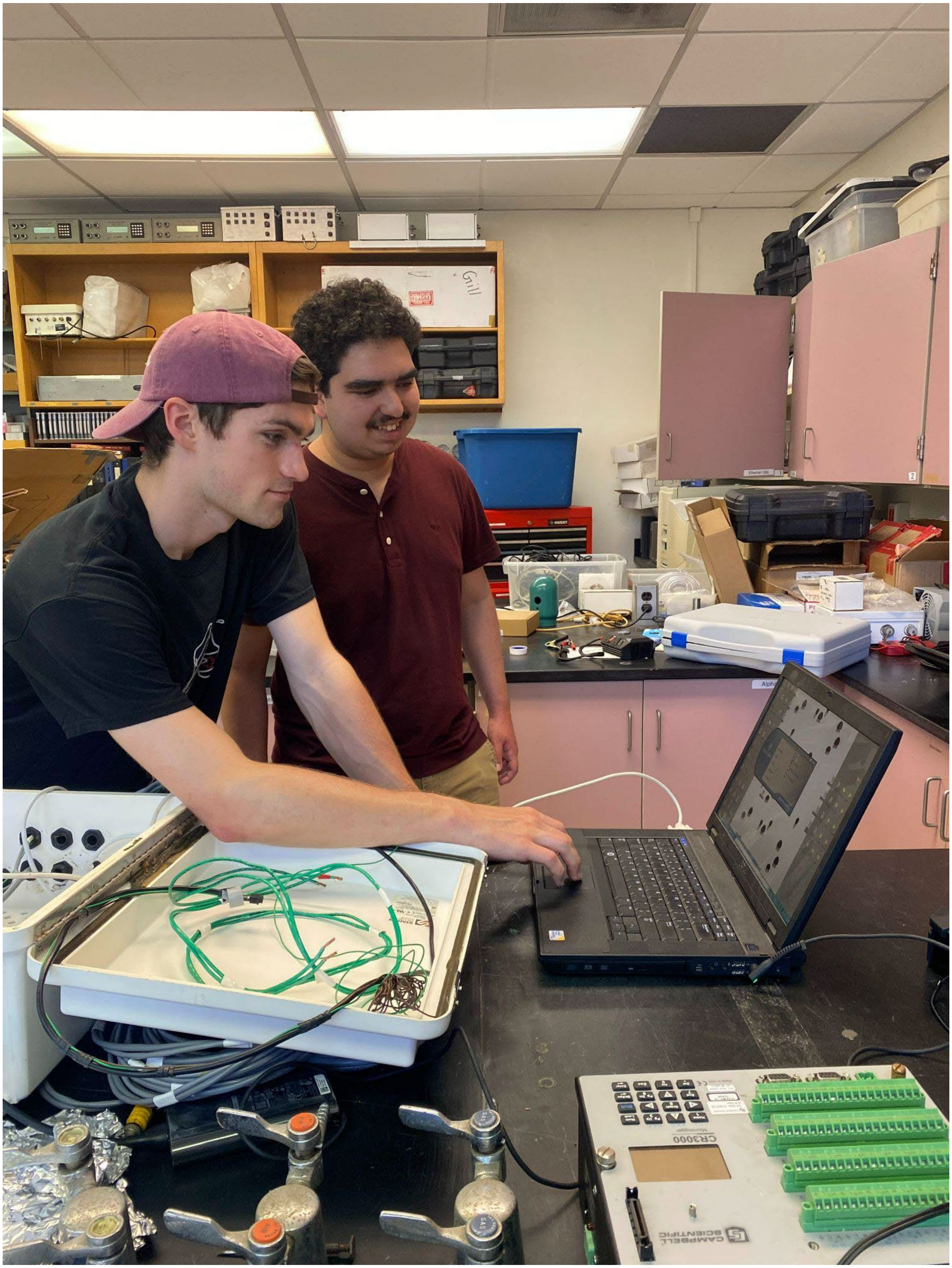
Never has it been easier to step up to a great challenge; the challenge to stand up against the destruction of our only home, Earth. Numerous growing issues such as coral bleaching, nitrogen imbalance, and worsening air quality require immediate addressing for all life on Earth to continue. Given the severity of these environmental plights, I quickly found my place as an intern at the SDSU Coastal and Marine Institute Laboratory this summer.

As an interning undergraduate, not only was I able to contribute to meaningful research in marine ecology but form constructive connections with equally passionate students and mentors. United by our shared calling to protect our planet, I found my comradery in the Ochel-Zona laboratory, an installation of CMIL that studies the coastal carbon cycle and the lasting impacts of microplastic accumulation.

In short, microplastics are smaller than what our human eyes can directly see (roughly < 500 μm). Microplastics split from larger plastic debris through a process called photo-oxidation. This could be anything from containers, clothing, or even scientific waste. Every day, you, me, and nearly all living things across the globe consume them. When I say living things, I don’t just mean humans– let alone animals! The plant life of our oceans is also affected by this issue.

Working under the head scientist and ph.D candidate, Alyssa Dubord, and the San Diego State University Microbial Biology third-year, Tristan Dubord, our goal for this summer was to construct a sustainable and reusable plankton net for collecting and analyzing microplastic at multiple depth profiles. At the same time, we were curious about how microplastics relate to macrophyte sediments (specifically eelgrass) and our carbon cycle at large. Coming in as a Liberal Arts and Sciences major, I knew the greatest challenge for me was being able to fully understand; learn.

To my relief, Alyssa would remind me that as an intern, the purpose of my being at the lab, on campus, and over the ocean was for me to learn; something nobody should be ashamed to do, but feel a great sense of gratitude. I'd come to find that between the sciences, there was also a place for my expertise in writing, communicating, and creativity. Instead of apprehension and imposter syndrome, I'd find great joy and fulfillment in waking up every day to the next step in our experiment. Yes, an experiment! We have also found ourselves early in this new, exciting study!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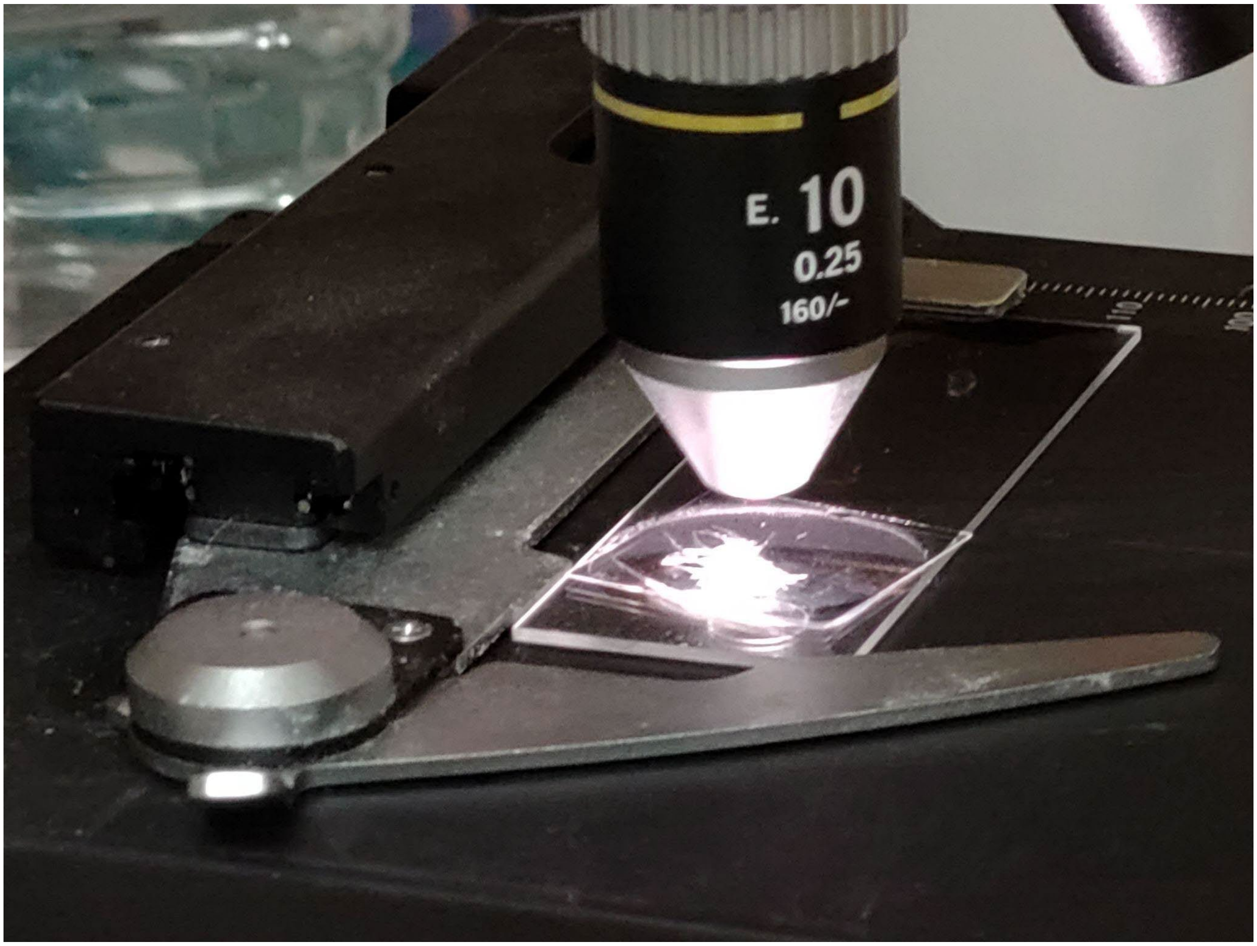
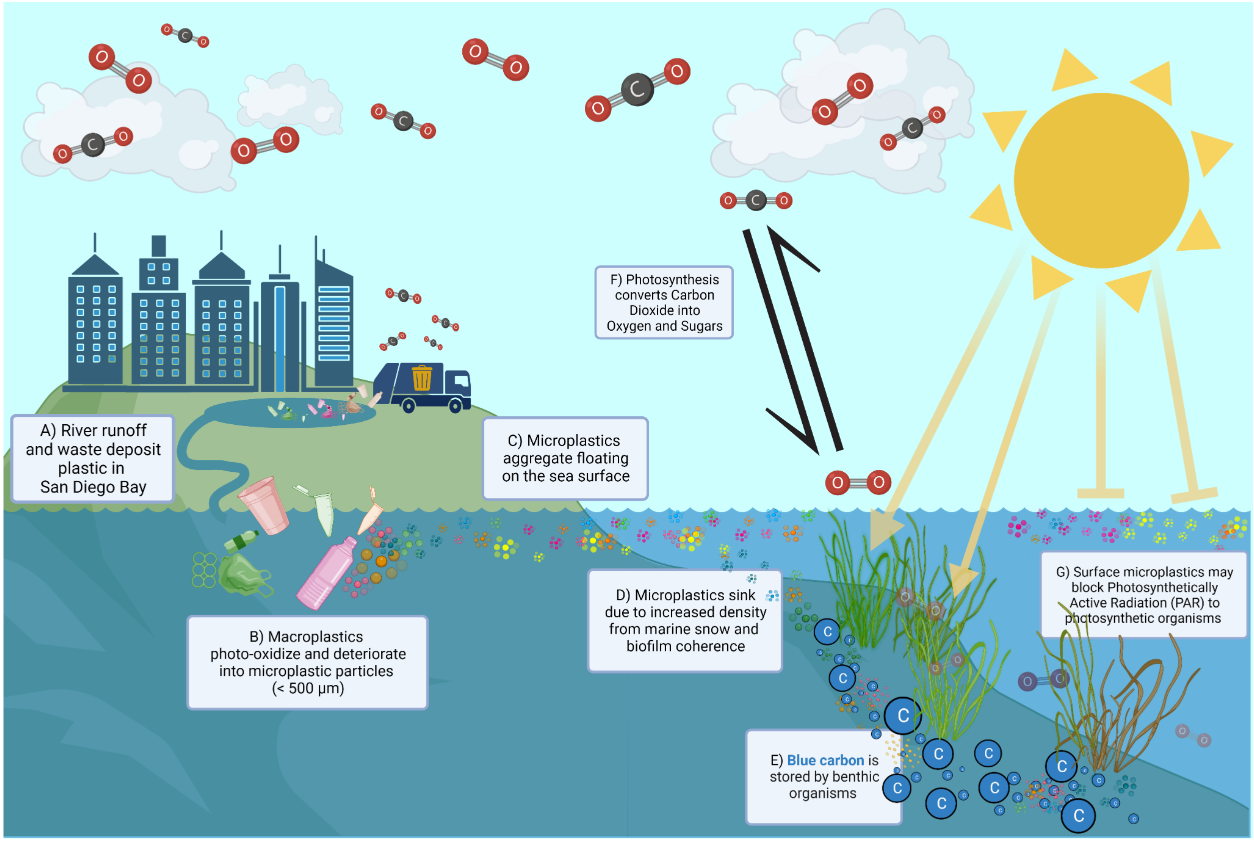
To be part of an early science study is to be part of a pilot study– yet another first for me! We continue the work of Dr. Walter Oechel and Dr. Donetella Zona which originally began in 2011 with trial runs of skimming through the sea surface for microplastics and conducting atmospheric analysis. Today, that same study continues but with further consciousness of the atmosphere with our research also taking place at the Ellen Browing Memorial Pier, or the UCSD Scripps Pier in La Jolla.



So, what did I learn this summer? First and foremost, microplastics could have a much greater effect on our environment than we may currently perceive. My own initial idea was that microplastics accumulate in the ocean, fish eat them, we eat the fish, and that is a problem somehow. *But nay…* Microplastics are interrelated to many complex systems in our ecosystem– even outside of our oceans.



It goes something a little more like this: (1) microplastics aggregate over the sea surface and below in sedimentary film; (2) eel grass and other blue carbon macrophytes sequester the carbon element in microplastics and other chemicals; (3) their ability to further sequester carbon is potentially inhibited; (4) on top of the fact that microplastics line the sea surface, photosynthetic radiation from the sun is *potentially* absorbed and limited; due to the possible degradation of macrophytes by microplastics, which play a key role in carbon sequestration, our coastal carbon cycle could also be greatly affected. (I hope you appreciate the visual above! It was Tristan's idea to use BioRender!)

That being said, this is still all speculation based on very early scientific findings on behalf of Dr. Walter Oechel and Dr. Donetella Zona– the aforementioned frontrunners for this study which we continue in our work this summer. There is much discovery still to be had before we can come to a concrete theory– and eventual conclusion. I had to learn to be content with the stage my team was currently in when it came to progressing in our research. Learning to appreciate even the smallest steps toward better understanding our coastal carbon cycle, such as the engineering and deployment of a plankton net, made each and every day all the more valuable– and left us only more motivated for the next.

Some other valuable skills me and Tristan acquired for the duration of the summer were learning how to calibrate oceanographic sensors (the Manta Eureka 35+), how to read data from atmospheric sensor towers at Scripps Pier (the Oechel-Zona Eddy-Covariance Tower), and even the chance to build upon my affinity for writing through the curation of a float plan; a document helpful in coordinating safe and productive boating excursions. What is there I can't say was of value during my time as an intern here at CMIL! If you are reading this on the edge of applying through your school, I say waste no moment hesitating and give yourself the chance to do meaningful work in protecting our planet. You won't regret one minute of it.