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# Sweating the Small Stuff: Linking Plankton to Climate Change, Brian Kim '18 Makes Connctions

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# STUDENTS

## SWEATING THE SMALL STUFF

Linking plankton to climate change,  
Brian Kim '18 makes connections

By Stephen Collins '74

Sure, there are things in the world smaller than plankton. Microplastics, for example. The latter, which are now 70 percent of all marine debris, get so small that the former eat them. And then there's plankton feces. Also tiny.

It takes an expansive mind to connect microscopic marine copepods (certain crustacean plankton) unwittingly chomping on floating microplastics with a bigger picture: the planet's carbon pump and global climate change. But that's what Brian Kim '18 decided to investigate during Jan Plan, working with Bigelow Lab Senior Research Scientist David Fields.

The story begins with Kim spending the month at the Bigelow Laboratory for Ocean Sciences in East Boothbay, Maine, working on an experiment titled "The Effect of Microplastics on Grazing and Fecal Sink Rates of Marine Copepods." It ends (for the time being) with Kim presenting his research at the national summer meeting of the Association for the Sciences of Limnology and Oceanography in Santa Fe June 5-10. Not a bad exclamation point on his sophomore year, but he's also presenting freshwater research, on gloeotrichia, at the Society for Freshwater Science annual meeting in Sacramento, Calif., in May.

Wait. Copepods' poo (as he calls it)? "It sounds so bizarre and it's such a specific topic, but there's a surprising amount of literature about it," Kim said in March, a note of incredulity in his voice.

Backing up, before Kim did his Jan Plan at Bigelow, he spent the fall of his sophomore year at Bigelow researching gloeotrichia, freshwater bacteria that can make water toxic to humans. He took courses, a field component led by Fields, and worked on research with Senior Scientist Pete Countway, who is a research partner of Kim's academic advisor, Assistant Professor of Environmental Studies Denise Bruesewitz, in whose lab Kim works on campus.

The genesis of Kim's January experiment came as his Bigelow semester program wound down last fall. "He started



Plastic is much lighter than algae they usually eat. ... It's potentially going to change that flux rate of carbon."

—Bigelow Lab Senior Scientist David Fields on research findings of Brian Kim '18

*Brian Kim '18 and Rebecca Chmiel '17 conducting water-quality studies on the Belgrade Lakes. Kim does research on both fresh and salt water issues.*

spending a lot of time mingling around in my lab," Fields said, "and it was a fluke where he asked if he could do some stuff about microplastics and zooplankton."

Kim said Fields suggested literature that he read over winter break, and he returned to Bigelow in January ready to go. "What can we investigate about these guys?" Kim remembers asking. "Let's see if they eat [the microplastics] or if they don't eat them."

Only "real science" intervened, Fields said. The plastic particles he'd ordered clumped together so the copepods couldn't ingest them, so he ordered surfactants that would disperse them. Then he had to make sure the surfactants weren't changing the results of his experiment. "I stress with them that their experiments are only as good as their controls," Fields said.

Fields credited Kim's resilience and tenacity for getting through the experiments in a month. "He'd come

into my office ripping his hair out because he'd been up all night," Fields said, but did Kim find an answer? "Yes he did!" Fields said. "He found a change in the rate. Plastic is much lighter than algae they usually eat. ... It's potentially going to change that flux rate of carbon."

Associate Professor of Biology Cathy Bevier, Kim's first academic advisor at Colby, said, "I feel lucky to have been able to steer Brian," helping him get into the Bigelow semester a year earlier than normal. "Ask permission," she urged him. "Pursue things you want to do, and if there's some kind of rule or restriction, just ask about it.' We can almost always make an exception if they're qualified."

And she found Kim highly qualified. He'd worked as a youth ocean advocate at the Seattle Aquarium and had done oceanography research at the University of Washington. With more incoming students bringing credentials like that

to Colby, "more faculty are willing to take a risk on first-year students and pull them into their labs and into their research programs," Bevier said. "I think their experiences, their academic preparation has been on the rise the past several years."

Fields too, at Bigelow, recognizes Kim's promise. It's not if but when Kim pursues his Ph.D. that he'll have to pick toxicology, zooplankton, biogeochemistry, or something else, Fields said. "He's clearly one who will go on."

And Kim was amazed at the depth of the partnership they forged and the connections that Fields and other Bigelow scientists opened up for him. "David was like, 'Brian, I can guarantee that you and I will be working together a long time after your undergraduate career.'" Kim said. "Hearing that has a really big impact."