UC SANTA BARBARA

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Studying Microbes in the Sargasso Sea

A new initiative, supported by an anonymous $6 million grant, will foster collaborative research on the distinctive microbial communities that are the foundation of the ecosystem in the Sargasso Sea, an area that occupies two-thirds of the North Atlantic Ocean.

Craig Carlson, chair of UC Santa Barbara's Department of Ecology, Evolution and Marine Biology and an adjunct faculty member at the Bermuda Institute of Ocean Sciences (BIOS), will serve as director of the project.

Well known for research that links changes in dissolved organic matter to microbial activities in the Sargasso Sea, Carlson will coordinate the team of scientists from BIOS, UC Santa Barbara, Oregon State University, Woods Hole Oceanographic Institution in Massachusetts and The University of Exeter in England.

"From a large biogeochemical perspective, we can really start to understand how microbial community structure helps produce and redistribute carbon in the ocean and vice versa," said Carlson.

The project will leverage the ocean measurements and ongoing research at the Bermuda Atlantic Time-series Study (BATS) site, employing new collaborations and technologies to scrutinize the ocean's smallest life forms. The team will focus on understanding what chemical compounds microbial communities produce, transform

and leave behind, including through community interactions with viruses and zooplankton.

Phytoplankton, the ocean’s floating forests of single-celled microbes, play a vital role in the ocean carbon cycle as they harness solar energy and transform carbon dioxide into the organic carbon that sustains marine food webs.

However, the ocean carbon cycle quickly adds up to a complex network of chemical reactions. The fate of a plankton cell’s organic matter can take a circuitous path through the microbial food web, where more than a million bacterial cells in each drop of seawater colonize and consume organic material. The cells also are preyed upon by larger microbes or are attacked by viruses. The mix of dissolved organic carbon resulting from cells that have died intermingles with organic compounds deliberately secreted for cell-to-cell communication and defense mechanisms.

“It’s a perfect storm of technology, expertise and study site,” Carlson said. “We have a great track record working together at BIOS, and we’re extremely excited about this opportunity to move the field forward.”

About UC Santa Barbara

The University of California, Santa Barbara is a leading research institution that also provides a comprehensive liberal arts learning experience. Our academic community of faculty, students, and staff is characterized by a culture of interdisciplinary collaboration that is responsive to the needs of our multicultural and global society. All of this takes place within a living and learning environment like no other, as we draw inspiration from the beauty and resources of our extraordinary location at the edge of the Pacific Ocean.