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Thorndyke Bay, a salt marsh on the Hood Canal. Credit: League of Extraordinary Observers.

Blue Carbon Goals: Protect Marine Carbon and Draw Down More of It

By Mark Fogarty

"Blue carbon" mandates include protecting oceans and coastal waterways and learning how to leverage systems that are already more carbon-intensive than equal amounts of dry land.

Olga Rukovets, writing in Columbia Climate School's State of the Planet, interviewed Dorothy Peteet in a recent issue about measuring and preserving the carbon in the oceans and coastal waterways.

Sargassum seaweed on Crane Beach, Barbados. Credit: Clump, Creative Commons.

Peteet, a senior research scientist at NASA/Goddard Institute for Space Studies and adjunct professor at Columbia University's Department of Earth and Environmental Studies, is measuring the carbon content of marsh sediments, according to the article.

"Salt marshes store about 50 times more carbon than terrestrial forests, despite their relatively small area," she said. "This carbon is at risk with sea level rise and will contribute to atmospheric greenhouse gas heating if the marshes are flooded," she told Rukovets.

Her colleague Ajit Subramaniam is looking at ways to make sure the large amounts of carbon stored aren't released into the atmosphere, and then leveraging that by methods like growing and sinking kelp.

Rukovets noted wetlands store 20 to 30 percent of the world's carbon.

According to Subramaniam, "There is a lot of carbon stored in the stocks, seagrasses, and microalgae in the ocean and growing along the coast. So, you want to make sure that any coastal development or building or human activities, such as shrimp farming or aquaculture, don't end up releasing this carbon," he said.

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Growing kelp draws down carbon through photosynthesis, Subramaniam said, but the challenge is to keep that carbon safely stowed away and not in danger of being released back up into the atmosphere.

“You can consume or repurpose the kelp. Or you can sink and bury it in a durable way,” he said. He is working on the latter approach, pointing out that consuming kelp or making biofuel ultimately can put carbon back in the sky.

He favors a deep burial procedure in the ocean. He thinks it should be sunk “for at least 100 years so that the carbon captured by photosynthesis does not go back into circulation in the atmosphere,” he said.

An approach he favors is capturing Sargassum microalgae in nets and burying it 2000 meters down in the ocean, according to the article.

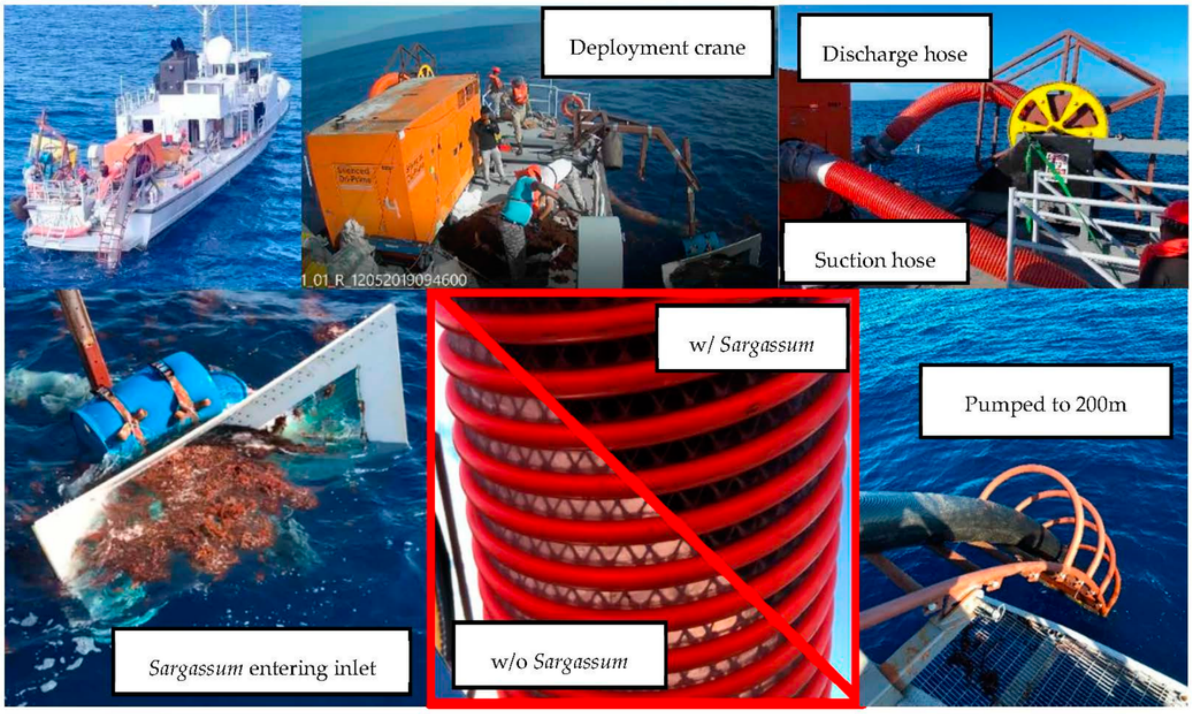
Once the net is full, he explained, a fastener will break and a weight in the net will take the algae and dispose of it far under the surface of the ocean.

The Sargassum has been building up in recent years, the scientist said.

“There are about one million metric tons of carbon in this ‘new’ Sargassum population,” Subramaniam said. He believes they can sink about 100,000 metric tons a year, he told Rukovets.

A third colleague quoted in the article, Romany Webb, said she was concerned about the social and legal implications of some of these blue carbon techniques.

For instance, “Some groups have also expressed concern that, because projects would take place in the ocean, which is part of the global commons, they may be subject to limited oversight and control by national governments,” she said.



Sargassum Ocean Sequestration (SOS) Carbon pilot tests in Fall 2019, Caribbean. (Top Left) Drone view of the SOS Carbon pilot system with the 200 m lay-flat hose unreeling off the stern of the vessel. (Top Middle) Footage showing the deployment crane lowering the suction inlet device into the water. (Top Right) Transparent suction hose and discharge hose arrangement into and out of the 5000 GPM pump, respectively. (Bottom Left) Sargassum entering the suction inlet device where a co-axial auger meters solids flow. (Bottom Middle) Transparent suction hose shown with and without Sargassum flowing through it. (Bottom Right) The pressurized discharge hose descending from the stern of the vessel, through which Sargassum is transported to the critical depth. *Phycology* 2021, 1(1), 49-75; https://doi.org/10.3390/phycology1010004