
Planetary health biosignatures: algal blooms and the milky seas phenomena

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Project Description:

The milky seas phenomena is a major mystery in microbiology, when vibrio bacteria patches of densities reaching 108 bacteria per ml emit bioluminescence in huge patches (up to the size of Greenland) that can be seen from space for weeks on end. These bacterial densities are likely linked to feeding on algal blooms. Blooms can be seen every year or two in Indonesian waters, either in the Banda seas or south of Java Island. A huge bloom has been documented in 2019.

I am putting together a taskforce to go sample milky seas. This has never been achieved, because of the unpredictability of these blooms, which are linked to upwelling of nutrients and water temperature, and our inability to detect them in the past. It is now possible to detect them by satellite, and the blooms mostly happen in August, either in the Banda or Java seas in Indonesia. In collaboration with A/Prof. Kimberly Fornace and Asst Prof. Swapnil Mishra, we are setting up a system tracking the phenomena using satellite imagery and predicting its occurrence. Studying the environmental factors causing its occurrence and how it develops could yield insights on a microbial population visible from space.