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Short Communicaton

Significance of Coral Reef in Ecosystem

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ABOUT THE STUDY

The frequency and severity of bleaching occurrences have sharply increased due to global warming, and this has already greatly harmed reefs all across the world. However, it has been contested that other variables have a significant role in exacerbating the consequences of high temperatures. With coral reefs becoming more accessible starting in the last part of the 20th century, it didn't take long for people to realize how vulnerable coral reef populations were to both direct and indirect human influences. The rising quantity, intensity, and types of human activities that have an influence on marine and global systems present serious dangers to coral reefs in the form of climate change and ocean acidification. Management takes place in the context of growing human use of coastal and marine space, various scale transboundary water column connections of lifecycle processes, and notably of accessible coral reefs.

Experience gained over four decades has shown how crucial it is to combine biophysical and socioeconomic sciences and to share information with local populations in order to create and execute successful management [1]. The challenge for research and management is to provide knowledge and management solutions that can better understand and strengthen resilience to improve the outlook for coral reef communities in the face of environmental and socioeconomic change. Numerous environmental services, including coastal protection, are provided by coral reefs. The procedures required in providing this specific service, nevertheless, are not entirely understood.

There is still a need for greater research about the ability of various reef morphologies to provide coastal protection, even though different zones of a reef have been linked to various degrees of wave energy and wave height attenuation [2]. Additionally, it has not been fully explored how the primary dangers that climate change poses to coral reefs interact with one another. While there are many mitigation solutions and recovery techniques are being investigated, it is still difficult to put them into practice and assess their effectiveness [3,4]. In coral reefs, physiological activities like respiration and nutrient intake are fundamentally dependent on local flow dynamics. Despite the fact that corals serve as hosts to a quarter of all marine life and are always under threat, describing the hydrodynamics between the branches of coral remained a significant challenge [5].

CONCLUSION

Here, we use three-dimensional immersed boundary, large-eddy simulations for four distinct colony geometries under unidirectional incoming flow circumstances to examine the impacts of colony branch density and surface structure on the local flow field. The first two colonies, one with a heavily branching geometry and the other with a rather loose geometry, belonged to the genus *Pocillopora*. The second set of geometries, one with the verrucae that cover the surface intact and the other without them, were created from a scan of a single *Montipora capitata* colony. The mean velocity profiles for the *Pocillopora* corals significantly changed in the dense colony's centre and significantly decreased at middle heights, where flow penetration was poor, whereas the loosely branched colony's mean velocity profiles maintained a consistent character from the front to the back of the colony. Contrary to popular belief, the *Montipora* coral colony without verrucae produced almost twice as much maximum Reynolds stress above the colony as the colony with verrucae. In contrast to the colony with verrucae, the smooth colony is predicted to have improved mass movement as well as greater bed shear stress and friction velocity values. Turbulence controls coral reefs' chemical and physical interactions with the surrounding waters at the lowest scales.

REFERENCES

1. Kenchington R. Science and the management of coral reefs. Mar Pollut Bull. 2018;136: 508-515.
2. Elliff CI, Silva IR. Coral reefs as the first line of defense: Shoreline protection in face of climate change. Mar Environ Res. 2017;127:154.
3. Md Hossain M, Staples AE. Effects of coral colony morphology on turbulent flow dynamics. PLoS One. 2020;15(10):e0225676.
4. Ricardo GF, Harper CE, Negri AP, Luter HM, Wahab MAA, Jones RJ, et al. Impacts of water quality on Acropora coral settlement: The relative importance of substrate quality and light. Sci Total Environ. 2021;777:146079.
5. Davis KA, Pawlak G, Monismith SG. Turbulence and Coral Reefs. Ann Rev Mar Sci. 2021;13:343-373.

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