To understand the sea, focus on the seabed

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A starfish explores the benthos. Credit: Linus Nylund / Unsplash

A new review, led by Plymouth Marine Laboratory scientists, sets priorities for the benefit of future benthic research.

The benthic environment is critical to marine ecosystems. It harbours a wealth of life on, in, and above the seabed, and is vital to ocean systems,

[marine biodiversity](#), and climate regulation. The ecosystem services it provides are important to human society.

Modelling benthic systems is crucial in helping to further understand them and their responses to the pressures they face from climate change and [ocean acidification](#). The review, published in Frontiers Marine Science, has highlighted the challenges benthic models face, identifies research priorities, and offers advice on what needs to be done to ensure the complexities of the benthic environment are appropriately represented in future studies.

Among the topical challenges covered are the dynamics of the boundary layer between the benthic environment and the open water of the pelagic zone; understanding how single events such as storms or earthquakes impact benthic communities and biogeochemistry; and how best to [model](#) the primary production of the microphytobenthos – the abundant and essential microscopic algae that dwell in the seabed and contribute to the chemistry of the surrounding ocean.

The challenges can be tackled by an approach that contains three key pillars, says PML's lead author, Dr. Gennadi Lessin: "As with many areas of marine science, advancement requires an interdisciplinary approach, bringing together modellers and empirical scientists. Alongside this, we need to enhance communication and mutual understanding, and a common terminology, used across the entire benthic modelling community, will allow us to promote model integration. And finally, a framework of hierarchical complexity for benthic-pelagic models should be developed, allowing focus on specific aspects depending on the questions to be answered."

"With all three pillars in place, we could foster more interdisciplinary collaboration, and better understand, manage and predict the marine [environment](#)."

More information: Gennadi Lessin, Yuri Artioli, Elin Almroth-Rosell. et al. (2018) Modelling Marine Sediment Biogeochemistry: Current Knowledge Gaps, Challenges, and Some Methodological Advice for Advancement. doi.org/10.3389/fmars.2018.00019