UC SANTA BARBARA

THE Current

October 27, 2017
Jenny Seifert

What About the Oceans?

The oceans are an integral part of life on Earth, to say the least. Half of our air comes from oceans. They absorb vast amounts of heat produced by climate change and provide enormous value in the form of natural goods and services essential to life, including carbon sequestration and food. They also cover two-thirds of the planet.

Yet a conceptual framework called planetary boundaries, which has influenced how scientists and policymakers think about the Earth's capacity to support humanity, focuses primarily on land-based systems and largely ignores the oceans.

First introduced in 2009 and now incorporated into the United Nation's Sustainable Development Goals, the framework defines limits for nine planetary processes, such as climate change and the freshwater cycle, which regulate the conditions within which humanity can continue to thrive.

Now, a new paper, published in the journal Nature Ecology and Evolution, calls the near absence of oceans from planetary boundaries a major oversight that limits the understanding of the planet's actual boundaries and the framework's usefulness for policy considerations.

"Oceans are a fundamental part of the processes of our planet," said co-author Benjamin Halpern, a professor at UC Santa Barbara's Bren School of Environmental Science & Management. "To talk about planetary boundaries, you have to include the ocean. If you were to flip it around and define planetary boundaries based only

on the oceans, wouldn't it seem odd to exclude the land?

"Ignoring the oceans is like taking your car in for a tune up and only checking the tire pressure," added Halpern, also executive director of UCSB's National Center for Ecological Analysis and Synthesis.

According to the Halpern and the study's authors, including oceans in the planetary boundary framework could entail accounting for changes to marine habitats, such as mangroves, in analyses of land-system changes and including the demands of seafood production on freshwater supplies.

Their paper provides a heuristic framework for thinking about how humans interact with the planet, noted Halpern, who stresses that further research is needed to delineate where these planetary boundaries lie.

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.