

Distant planets provide a glimpse of the future of Earth's oceans

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Vast seas of hydrocarbons and masses of water below kilometres of ice are among the unusual environments on distant planets that are providing insights into the potential fate of our own oceans.

A new book by University of Leicester geologists explores what we know about the history of our planet's oceans and what new discoveries on other worlds are telling us about their future.

Published today (23 October) by *Oxford University Press*, *Ocean Worlds: The story of seas on Earth and other planets* discusses the range of change in Earth's oceans, both in the long-term, and the current changes that have been brought about by [climate change](#).

Authors Dr Jan Zalasiewicz and Professor Mark Williams from the University's Department of Geology also detail the human impact on our oceans: the over-fishing and pollution that is putting this precious resource at risk; and the extraordinary story of how plastic is now spreading through our oceans.

Dr Zalasiewicz said: "We would define an ocean as a large body of water - or other comparable fluid - on a planet or moon.

"We now know of possible past oceans on Venus, and likely [ancient oceans](#) on Mars, as well as oceans that lie beneath the ice on moons of Saturn and Jupiter, and the hydrocarbon seas on the moon Titan. These tell us how various [ocean](#) states can be, and how oceans might change -

or disappear - through time."

Oceans make up most of the surface of our blue planet. They may form just a sliver on the outside of the Earth, but they are crucial, not only in hosting life, including the fish and other animals on which many humans depend, but in terms of their role in the Earth system, in regulating climate, and cycling nutrients.

However, this system is under threat from the impact of humans. Among the examples they highlight are the Mediterranean Sea, where trawling has literally smoothed the canyons of the seabed and smashed through delicate deep water coral colonies; and the dramatic decline of the shark, which has seen a 50% decline in nearly all species in the North West Atlantic alone over the 15 years of the late 20th century.

Dr Jan Zalasiewicz and Professor Mark Williams are both leading proponents of the concept of the Anthropocene - a new epoch in which humans have changed the global landscape in which we live.

Professor Mark Williams said: "Our oceans today are changing rapidly, and some of the changes - due to overfishing, pollution, acidification and warming - may come to rival some of the great sea changes of the past.

"In terms of damage, smashing corals or hunting sharks near to extinction are as bad as it gets. But in both cases, fish stocks can recover if carefully managed, and trawled seabeds will also recover over time.

"We still have time though - if we act quickly as a global society - to preserve the biological riches of the oceans."

Ocean Worlds: The story of seas on Earth and other planets is published by OUP at £20 in hardback.

Provided by University of Leicester

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