Tool kit for ocean health

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The ocean is undergoing global changes at a remarkable pace and we must change with it to attain our best possible future ocean, warns the head of The University of Western Australia's Oceans Institute.

One of the global leaders in ocean science, Professor Carlos Duarte has shared his insights on the future of the world's oceans in a paper published in the international journal *Frontiers in Marine Science.*

In the paper Professor Duarte explains the grand challenge researchers face in addressing global change and the future state of the ocean.

"The ocean is under significant impact by anthropogenic global pressures such as ocean acidification, warming, overfishing and pollution, resulting

from the impact of human activity on major processes that regulate the functions of the planet," he said.

"Dependence on resources including water, energy and key elements has prompted a suite of changes at the global scale and we are now facing the impacts of climate change, a loss of biodiversity and deteriorating water quality.

"While human pressures such as overfishing have occurred for almost 200,000 years, the cumulative impact of these combined pressures in recent years is now significantly influencing ocean health through unprecedented pressures.

"Consequently, planning of infrastructure, resource management, industry operations and conservation policies all require the capacity to anticipate change and forecast the likely properties of the future ocean."

Professor Duarte explained that a number of conclusions can be forecast by analysing current ocean trends.

"By the end of the twenty-first Century the oceans will be warmer, with a reduced ice extent, higher sea levels, more acidic and with somewhat lower oxygen levels than at present," he said.

"Research effort must be directed to understanding the responses of marine systems to these multiple, cumulative pressures."

Professor Duarte advises that policy makers, the public and the scientific community should accept change as a prerequisite to manage it. He emphasises the need for partnerships to frame research findings in effective ways and foster widespread action.

"Close cooperation between these groups is needed to progress our

capacity to manage ocean problems adaptively," Professor Duarte said.

"The future ocean will be, no doubt, different in many ways from the ocean we enjoy today, but we can still direct that change. In order to get back behind the steering wheel the goals of policy makers, the public and scientists must converge to guide this change in order to achieve our best possible future ocean."

More information: "Global Change and the Future Ocean: A Grand Challenge for Marine Sciences." *Front. Mar. Sci.* DOI: 10.3389/fmars.2014.00063

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