

THE AUSTRALIAN

Climate watershed

As our climate changes oceans need us, and we need them, more than ever.

By **JAMES BRADLEY**

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A wave hits a rock pool at Sydney's Curl Curl beach.
Picture: Getty Images.

In *The Sea Around Us*, a luminous 1951 exploration of the world's oceans, American marine biologist Rachel Carson sought to understand the human fascination with the sea, imagining the first humans to encounter its immensity.

“Standing on its shores,” she wrote,

he must have looked out upon it with wonder and curiosity, compounded with an unconscious recognition of his lineage. He could not physically re-enter the ocean as the seals and whales had done. But over the centuries, with all the skill and ingenuity and reasoning powers of his mind, he has sought to explore and investigate even its most remote parts, so that he might re-enter it mentally and imaginatively.

Carson's lyricism and sense of hushed sublimity is a product of its time and place, suffused by the romanticism that has pervaded American nature writing since Henry David Thoreau.

Certainly one does not have to look far to find other, less exalted, attitudes to the sea and its dangers. Even if opinions have differed over time, there is no question our relationship the ocean is almost as ancient as we are, as Eelco J. Rohling observes in *The Oceans*.

Middens scatter the world's coastlines, testament to our exploitation

of ocean resources. The ancestors of indigenous Australians must have developed watercraft capable of deep ocean passages at least 50,000 years ago to navigate the Indonesian archipelago. It is probable such technologies existed even earlier to enable humans to cross the Red Sea on their way out of Africa.

Nor were we alone in this: although Rohling does not mention it, the supposedly primitive *Homo erectus*, ancestor of the Flores hobbits, must have made a similar passage through Indonesia, while our cousins the Neanderthals were crafting jewellery from shells at least 50,000 years ago.

Across the hundreds of centuries since humans left Africa the oceans have continued to shape our societies, providing resources, economic and cultural (after animals the ocean is one of our richest sources of myth and metaphor), enabling travel and conquest and driving technological innovation. Simultaneously their effects on climate and geography have had a profound impact on our history, driving the rise and fall of civilisations by altering rainfall patterns and drowning entire cultures as glaciers melted at the end of the last Ice Age.

For much of our history this relationship was mostly one way. Yet over the past 150 years the human impact on the ocean has grown ever more profound. Industrial whaling, overfishing, pollution and the multiple effects of rising global temperatures (in particular what Rohling describes as the “silent killer”, ocean acidification) have pushed many marine environments to the brink of collapse or beyond, a process that is only accelerating as human population and consumption continue to rise.

Rohling is an oceanographer and professor of ocean and climate change at the Australian National University. His book seeks to emphasise the perils of our failure to understand that the oceans are not limitless. Or the degree to which, to borrow American historian Will Durant’s famous formulation, “civilisation exists by geologic consent — subject to change without notice”.

To achieve this, Rohling offers a geological perspective, exploring the origins and development of the Earth’s oceans from their origins to the present day. His account starts with the Earth’s formation and the continuing mystery of where the oceans came from (until European space probe Philae landed on comet Churyumov-Gerasimenko in 2015 it was assumed most of the water on Earth was deposited from space around four billion years ago in the Late Heavy Bombardment, a hypothesis made untenable by differences in the isotopic

composition of the water on Churyumov-Gerasimenko and Earth).

He moves on to the emergence and development of life, exploring tectonics, currents and other large-scale oceanic processes, as well as the cycles of warming and cooling driven by biological and planetary factors.

The results are genuinely exciting, even if they do prompt questions about who the book is aimed at. In contrast to most popular science, *The Oceans* avoids journalistic emphasis on personalities or historical narrative, focusing instead on the actual science. This means it sometimes reads more like a textbook than a work aimed at the general reader. In the wrong hands that could result in a work that is dry or overly technical, but in fact the density of information and Rohling's clear, concise explanations make for exhilarating reading, not least because his delight in his subject matter is so palpable.

Most importantly though, Rohling's long view makes clear the vast scope of the transformation of the oceans taking place around us, underlining not just the effect on ecosystems and biodiversity, but also its geological scale.

Amid the rising tide of awful news about the oceans, the resurgence of global whale populations is a rare good news story.

Yes, certain populations remain under serious threat: the Yangtze River dolphin is functionally extinct, the vaquita and Maui's dolphin are critically endangered and warming waters mean northern right whales are dying in increasing numbers. But many whale species have rebounded in the three decades since commercial whaling ended.

The Oceans: A Deep History, by Eelco J. Rohling.

Having begun studying humpback whales in the Pilbara region of Western Australia in 1990, Australian marine scientists Micheline and Curt Jenner have observed this phenomenon first hand, a process Micheline documents in her memoir *The Secret Life of Whales*.

Beginning with a decade observing humpbacks off the Kimberley and Pilbara, the couple has spent time studying pygmy blue whales in the Perth Canyon, about 70km west of Fremantle, dolphins along the WA coast and minke whales on the Great Barrier Reef, and travelled to Antarctica to better understand the migratory behaviour of humpbacks.

Jenner's account of her life is exultant, lit by her endless wonder at

the magnificence of whales and her good fortune to have been able to spend a large portion of her life observing them at close quarters.

And while there are times one wishes she would dial the positivity down a little — I could have done with fewer exclamations of “How lucky are we!” — the book offers a delightfully human portrait of life as a working naturalist and a fascinating glimpse into the complexity and mystery of the whales she loves.

Perhaps predictably, many of the book’s best stories involve mishaps, most notably hilariously disgusting descriptions of being caught in blasts of whale mucus or covered in reeking orange whale poo (an experience that led to an important discovery about the behaviour of pygmy blue whales).

Similarly, Jenner’s discussion of the whale physiology is always interesting, whether she is detailing the diet of baby humpbacks (a nursing humpback mother produces 200-300 litres of milk a day, and because they do not feed during their northern migration, will lose 3600-4500kg while caring for their calf) or talking about sperm whales diving up to 3km deep in search of food.

Yet the most fascinating moments are those relating to the behaviour of the whales, and in particular the evidence of a complex inner life and bonding, whether in the form of maternal commitment, altruism or grief. These are questions Jenner alludes to but does not pursue.

As she points out toward the end, many whale populations are threatened by climate change, including its potential to disrupt the life cycle of krill. Sadly though, for most of us these problems are essentially abstract, stories about the plight of creatures we rarely see.

The Secret Life of Whales: A Marine Biologist Reveals All,
by Micheline Jenner.

Yet as Jeff Goodell’s *The Water Will Come* makes terrifyingly clear, the threat posed by climate change is neither abstract nor a problem for the future. It is real and happening all around us.

Goodell, a contributing editor at *Rolling Stone*, has written some of the most intelligent and clear-eyed accounts of the politics and practical effects of rising global temperatures. In this book he brings these skills to bear on the most discussed but possibly least understood dimension of climate change: rising sea levels.

As with many aspects of climate change, our capacity to effectively respond to the problem is limited by our inability to imagine its

consequences. But in the case of sea level rise that problem is exacerbated by our lack of certainty around how far and how fast seas will rise.

As Goodell makes clear, this lack of certainty about the level and pace of the rise should not be confused with a lack of certainty about whether they will rise, or whether that rise will be significant. Even the bottom end estimates suggest a 30cm rise by the end of the century, and many scientists now believe it is likely to be considerably more. Asked whether estimates of 2m by 2100 are too low, one glaciologist responds simply, “Shit, yeah.”

There have been other books about these questions but Goodell’s account is one of the best, capturing not just the scale of the problem but also, through interviews with politicians, architects, planners and real-estate developers, its sheer complexity in practical and political terms and the unequal distribution of effects between rich and poor.

Yet while one of the highlights of the book is its remarkable opening section in which Goodell offers a chillingly plausible portrait of the destruction of Miami in a hurricane 20 years from now (a device he borrows from Rachel Carson’s seminal *Silent Spring*), the real achievement lies in its clear assessment of the scale of the social and economic disruption that lies just over the horizon.

For, like Rohling and to a lesser extent Jenner, Goodell recognises we inhabit a moment in which geological and human timescales have collapsed into each other, creating a situation where the fate of the human race and the fate of the planet are now interdependent.

The Water Will Come, by Jeff Goodell.

Or, as Carson put it more than half a century ago, “it is a curious situation that the sea, from which life first arose should now be threatened by the activities of one form of that life. But the sea, though changed in a sinister way, will continue to exist; the threat is rather to life itself.”

James Bradley is a writer and critic. He edited The Penguin Book of the Ocean.

The Secret Life of Whales: A Marine Biologist Reveals All

By Micheline Jenner

NewSouth, 320pp, \$29.99

The Water Will Come: Rising Seas, Sinking Cities and the Remaking of the Civilised World

By Jeff Goodell

Black Inc, 352pp, \$34.99

The Oceans: A Deep History

By Eelco J. Rohling

Princeton University Press, 272pp, \$59.99 (HB)

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