

Deep mysteries

Arguments among ocean scientists show how much remains to be discovered.

It is the ultimate metaphor for the unknown: the deep; the depths; the abyss. The ocean is our ultimate ancestral home and a constant and alluring source of opportunity, danger and mystery.

Certainly, those scientists who spend their careers peering into the seven seas are quick to dredge up the idea that we know more about celestial bodies than we do about the oceans. Who can blame them when outer space grabs the attention? Witness the interest in the Rosetta comet mission or last week's announcement of more exoplanets — now counted in the hundreds — which received wall-to-wall press coverage.

News about the oceans tends to be bad, and feeds the dark imagery — such as Malaysia Airlines flight MH370, which is believed to have gone missing over the Indian Ocean with huge loss of life, or the enormous car-carrying ship that ran aground a fortnight ago off the UK coast.

Some scientists are now questioning whether this drip feed of negativity about the oceans is reflected in the attitudes of researchers. Carlos Duarte of the University of Western Australia in Crawley and his colleagues claim in a provocative paper that ocean science focuses too much on the narrative of man-made disaster (C. M. Duarte *et al. BioScience* <http://dx.doi.org/10.1093/biosci/biu198>; 2014). Their study argues that “doom and gloom media accounts” of the terrible state of the oceans are frequently not based on strong evidence.

Some marine situations painted as global calamities are well supported by science, they acknowledge, such as the depletion of fish stocks. But others are far from certain; for example, global explosions in jellyfish numbers and the predicted impact of ocean acidification on organisms such as corals. The media can be prone to exaggeration, but marine researchers, too, “may not have remained sufficiently skeptical”, say Duarte and his co-authors. Some ‘calamities’ are now accepted by researchers, and repeated as truth owing to problems with citations and observation bias, and to the desire to help solve these problems. This is

a contentious thesis, and other researchers dispute it. As usual in such spats, both sides argue that more work is needed. It is hard to disagree.

Some progress on one high-profile marine problem — the fate of coral reefs — is published on *Nature's* website this week. The study uses years of data from the Seychelles to unpick the factors that allowed coral reefs there to bounce back and flourish after a mass ‘bleaching’ event in 1998 (N. A. J. Graham *et al. Nature* <http://dx.doi.org/10.1038/nature14140>; 2015). Some 90% of the corals died and turned the reefs pale.

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Around half of the reefs recovered from the bleaching, but more worryingly, whether they were in a marine protected area seemed to make no difference to this recovery. Studies such as this will be increasingly important as climate change forces alterations in many marine systems. Even in well-studied ecosystems such as reefs, the effects of climate change and other human activity are unclear, and getting answers from such complex systems requires huge amounts of data. The Seychelles analysis used 17 years of data to come to its conclusions — data that were being collected when European scientists were still discussing parts of the Rosetta mission.

Some studies need even more data. Also published on *Nature's* website this week is a paper on sea-level rise that looks at tide data going back to the 1900s (C. C. Hay *et al. Nature* <http://dx.doi.org/10.1038/nature14093>; 2015). Such data have previously been used to estimate a sea-level rise of between 1.6 and 1.9 millimetres a year over the twentieth century. By contrast, Hay *et al.* find a lower rate of 1.2 mm per year. But their estimates for more-recent changes are 3 mm a year between 1993 and 2010 — in line with previous estimates. This implies that the recent increase in sea-level rise may be bigger than previously thought: a small but rather important difference.

Information on sea levels from some sites dates back to the eighteenth century. Yet the real value of this information is only now emerging. Ocean data are expensive to collect. Ships are costly to build, equally so to run. But to neglect the oceans because it is cheaper to get good results on land is foolish. The proverbial drunk searches for his keys under a streetlight because that is the only place that he can see. The sea may be mysterious, but some mysteries can be solved. ■

Out of the bag

The preference for either cats or dogs affects science more than you might think.

The much-discussed difference between pet cats and dogs was neatly summarized by the late British journalist Christopher Hitchens. “Owners of dogs will have noticed that, if you provide them with food and water and shelter and affection, they will think you are god,” Hitchens observed. “Whereas owners of cats are compelled to realize that, if you provide them with food and water and shelter and affection, they draw the conclusion that they are god.”

Many see the apparent conflict between the attitudes of the two animals mirrored in the personalities of those who choose to own one or the other. Cat owners, it is claimed, are more neurotic and open with their emotions. Dog people are more disciplined and outgoing (and not just for long, muddy walks). Science has little conclusive to say on the matter, but accident statistics do: a 2010 study of non-fatal injuries in the United States found that more than seven times as many people were likely to hurt themselves in falls caused by dogs as by cats. (Cat owners are allowed a feeling of smug superiority here, because the actions of dog owners were as much to blame for the accidents in many cases as the animals themselves.)

As we discuss in a News story on page 252, the differences between dog folks and cat people extend all the way up to senior scientists, including some at the US National Institutes of Health, at least according to feline researchers. Work on cats has been overlooked for years, they complain, partly because “there were more powerful people interested in dogs”. The complete dog genome was sequenced a decade ago, and has produced hundreds of genes linked to canine traits and diseases, but a high-quality version of the first cat genome was published only last year.

Now, the cat lobby is trying to catch up, and feline fanciers everywhere have their chance to help. Just US\$7,500 will pay for a single cat's genome to be sequenced, and the funders — pet owners, breeders, pet-food companies — get to choose the breed or even the individual animal. Together, the project organizers hope that comparisons between dozens of these separate genomes will shed more light on cat diseases and genetic mutations that may drive similar conditions in humans — just as they have already for dogs.

Indeed, as scientists know, cats and dogs have more in common than it might seem. Cats and dogs do not even have to fight like, well, cat and dog. Plenty of people own both animals, and research on these households offers some advice: get the cat first, and get both while they are young.

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Don't fancy either? Then take inspiration from Winston Churchill. “I am fond of pigs,” he said. “Dogs look up to us. Cats look down on us. Pigs treat us as equals.” ■