

COVER STORY

The Great Barrier Reef is dying? ... Again?

by Dr Walter Starck

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Every year for the past half-century news reports have bannered dire announcements by academic “experts” and environmental “activists” proclaiming imminent threats to the Great Barrier Reef. As in the fable about the boy who cried wolf, the public has largely become inured to this noise.



The Great Barrier Reef is visible from space,
but you have to be nearer to assess its health.

However, politicians (who, if anyone, should know better than to believe news reports and academics) still seem compelled to throw a lazy \$100 million or so annually to “manage” and “save” the reef. This sustains a significant local industry of manufacturing imaginary threats to the reef and hypothetical solutions to save it. Even though none of these threats has ever proved real nor the solutions workable,

this money is not entirely wasted. It does provide a permanent Barrier Reef holiday for a hundred or more academics, activists and bureaucrats.

Only occasionally do any of these people ever visit the reef itself and then few and but briefly. It's out there, over the horizon and underwater where one can safely claim or believe anything with little risk from conflicting reality.

Then too, the entertainment value of some of the more ludicrous solutions they propose should not be ignored. One of more amusing ones was a proposal to put shade cloth over the reef to protect it from bleaching; another entailed pumping cool water from the deep sea over the reef to prevent bleaching. Unfortunately, it seems that penny-pinching governments have allowed considerations of cost approaching the GDP and the massive vulnerability of such infrastructure to tropical cyclones to deter them from taking up any of these brilliant ideas.

Meanwhile, back in the real world, the Great Barrier Reef itself is a rather recent development. Only ten thousand years ago, when our own species had already been farming and living in villages for several thousand years, the Great Barrier Reef did not yet even exist, as the entire area was a coastal plain exposed by the lower sea levels of the last glacial period. Since then, sea levels have also been a couple of metres higher and temperatures a couple of degrees warmer than at present, yet the reef thrived. In deeper geologic time, most current coral genera have existed for tens of millions to over a hundred million years, and during most of that time the global climate was much warmer and carbon dioxide levels much higher, while again reefs flourished.

Reefs are highly dynamic and variable communities. Across the Pacific Ocean, healthy reefs can comprise from a half dozen corals and 100 species of fishes in the Eastern Pacific, to 500 species of corals and 1500 species of fishes in the Western Pacific. Significant differences are also common between nearby reefs and on the same reefs from year to year.

Devastation and recovery from storms, floods, bleaching, upwelling and starfish plagues are common events. A map of tropical cyclone tracks over recent decades depicts a tangled web across the Great Barrier Reef. Each one leaves behind a trail of tens of thousands of hectares of broken coral plus a heavy blanket of silt from the ground up coral and disturbed sediments. A varying abundance of the distinctive spines of the coral-eating crown-of-thorns starfish in reef substrates indicates that this too is nothing new but has been going on for thousands of years, and is similar to natural population fluctuations in various other species of starfishes in other habitats.

Bleaching too is nothing new but only newly noticed by ourselves. The characteristic scars it leaves in coral skeletons are apparent for millennia in recent corals just as they are in fossil corals from 60 million years ago.

Some areas of devastation are not uncommon in most large reef regions. In 2012 reef "experts" claimed that the Great Barrier Reef had lost 50 per cent of its coral over the preceding few decades. Now they say that half of the coral has been lost to the recent bleaching. It seems nothing has changed, or perhaps they have forgotten their earlier

claim. Self-contradiction is always a risk with “truth-lite”.

For those with limited direct experience of reefs and primed by belief in a litany of anthropogenic threats, both real and imagined, every fluctuation of nature provides abundant evidence that appears to confirm their concern.

This year’s featured threat is coral bleaching, and it is claimed that half of the Great Barrier Reef is bleached and presumed dead due to climate change. The recent bleaching on the Great Barrier Reef has been greatly exaggerated and there is nothing to indicate it is outside the bounds of natural variability or is driven by climate change.

For a start, the sea surface temperature record over recent decades exhibits no statistically significant warming trend in this region. While higher than usual temperatures have been associated with the bleaching, this has resulted from periods of extended calm, when wave-driven mixing ceases. In such conditions a surface layer of a metre or two of extra warm water forms that can be several degrees warmer than the water directly beneath.

Two to three-metre tides are common on the Great Barrier Reef, and surface warming bathes the shallow tops of reefs with abruptly changing temperatures as the tide rises and falls. Warm water running off reefs on a falling tide can also go deeper around the edges of larger reef flats and in channels between reefs. Even so, large areas of healthy coral remain unaffected on outer reef slopes and in deeper water.

Periods of extended calm leading to bleaching are commonly associated with El Niño conditions but can also appear at other times, especially in summer. Extensive studies of the El Niño phenomenon have found no evidence of increasing frequency or intensity for El Niño, and the understanding of it is still too poor for it to be incorporated into the climate models.

Interestingly, the recent bleaching on the northern area of the Great Barrier Reef has not extended to the reefs around Papua New Guinea immediately to the north and even closer to the Equator.

An additional factor which may have played a role in exacerbating any coral mortality from lower sea levels that is also associated with El Niño conditions, is the possibility of rain coinciding with a minus tide, when living corals are exposed to the air. At such times corals secrete copious mucous to protect themselves from drying out, but rainfall when they are so exposed can be fatal. In May last year there was a record rainfall at Cooktown on the coast immediately adjacent to the most intensely bleached area, and any exposed coral at this time would have certainly been killed.

Beyond this, there is no actual evidence of any decline in water quality for the Great Barrier Reef and the use of agrichemicals in the reef catchment has declined over recent decades. In short, no evidence exists for anything other than natural perturbations in the condition of the Great Barrier Reef.

Meanwhile, despite all the reports on the demise of the Great Barrier Reef, the reef tours and dive operations on the reef are still taking thousands of people on daily

trips to see the unspoiled beauty of the reef. Also, where I live, about half way along the reef at Magnetic Island, all around the shore are kilometres of fringing reef with lush coral growth and no bleaching. All the claims of threats to the reef are simply either hypothetical speculations or, in some instances, outright fabrications by researchers, bureaucrats and activists seeking grants, budgets and donations.

When one's livelihood, importance and moral righteousness all benefit from something, only a rare few might question it. This is even more so when it accords with what they have been taught, is the prevailing belief in their social circle, and any questioning of which would invoke strong disapproval.

However, if you are not a member of that tribe, a half-century of listening to a never-ending stream of failed prophecies about the imminent end of the Great Barrier Reef makes it difficult to become too concerned about the latest claims. A reality check on the track record makes strong scepticism prudent.



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Dr Walter Starck grew up on an island in the Florida Keys and in 1964 he completed a PhD degree at the Institute of Marine Science of the University of Miami. His research interest has centred on coral reef biology. His wide experience of reefs worldwide has encompassed the full spectrum of conditions, ranging from heavily impacted to untouched as well as several opportunities for decade or longer familiarity with individual reefs. In recent years he has written, spoken and consulted widely on environmental and resource-management issues.