

# Modern Scientific Controversies Part 2: The Great Barrier Reef Wars

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Guest Essay by Kip Hansen

**Prologue:** This is the second in a series of several essays that will discuss ongoing scientific controversies, a specific type of which are often referred to in the science press and elsewhere as “Wars” – for instance, this essay covers the Great Barrier Reef Wars. The purpose of the series is to illuminate the similarities and differences involved in each. I apologize to all the Australian readers here – the version I write of this story is from my outsider-looking-in viewpoint which may very different than the story viewed from Down Under.

Warning: This is not a short essay. Dig in when you have time to read a longer piece.

From *The Australian*, Saturday June 11, 2016, “Reef whistleblower censured by James Cook University” [paywalled]: (h/t reader [Hivemind](#))

*“When marine scientist Peter Ridd suspected something was wrong with photographs being used to highlight the rapid decline of the Great Barrier Reef, he did what good scientists are supposed to do: he sent a team to check the facts.*

*After attempting to blow the whistle on what he found — healthy corals — Professor Ridd was censured by James Cook University and threatened with the sack. After a formal investigation, Professor Ridd — a renowned campaigner for quality assurance over coral research from JCU’s Marine Geophysics Laboratory — was found guilty of “failing to act in a collegial way and in the academic spirit of the institution”.*

*“His crime was to encourage questioning of two of the nation’s leading reef institutions, the Centre of Excellence for Coral Studies and the Great Barrier Reef Marine Park Authority, on whether they knew that photographs they had published and claimed to show long-term collapse of reef health could be misleading and wrong.”*

[for more on this story see [Climate etc.](#) ]

This rather bizarre sequence of events follows rapidly on the heels of this:

*The Guardian* (UK), Thursday 26 May 2016, [Australia scrubbed from UN climate change report after government intervention](#):

*“Exclusive: All mentions of Australia were removed from the [final version of a UNESCO report](#) on climate change and world heritage sites after the Australian government objected on the grounds it could impact on tourism.*

*[Photo caption] The Great Barrier Reef is in the midst of its worst crisis in recorded history. Unusually warm water has caused 93% of the reefs along the 2,300km site to experience bleaching.*

*Every reference to Australia was scrubbed from the final version of a major UN report on climate change after the Australian government intervened, objecting that the information could harm tourism.*

*Guardian Australia can reveal the report “World Heritage and Tourism in a Changing Climate”, which Unesco jointly published with the United Nations environment program and the Union of Concerned Scientists on Friday, initially had a key chapter on the Great Barrier Reef, as well as small sections on Kakadu and the Tasmanian forests.....”*

The [UNESCO report](#), “World Heritage and Tourism in a Changing Climate”, introduces itself this way:

*“This report provides an overview of the increasing vulnerability of World Heritage sites to climate change impacts and the potential implications for and of global tourism. It also examines the close relationship between World Heritage and tourism, and how climate change is likely to exacerbate problems caused by unplanned tourism development and uncontrolled or poorly managed visitor access, as well as other threats and stresses. Tourism can also play a positive role in helping to secure the future of many World Heritage sites in a changing climate.*

*The report’s goal is to provide up-to-date information and a basis for action on climate change, tourism and World Heritage in the follow-up to the adoption of the Paris Agreement by the Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC) in December 2015...”*

The report itself was not written by UNESCO staff, but rather prepared for it by the [Union of Concerned Scientists](#) (UCS), an advocacy group originally organized to combat the nuclear arms race, but now a major campaigner for a broad range of energy issues and a major promoter of the consensus global warming/climate change world view, with a Board of Directors of impressive credentials, the vast majority of its members are everyday citizens. In fact the Lead Author of the report was [Adam Markham](#), the deputy director of climate and energy with the Union of Concerned Scientists who previously directed the World Wildlife Fund’s climate campaign, leading WWF’s international climate team at the 1997 Kyoto Conference.

What exactly did the government of Australia object to in the proposed sections on Australia in the report? The [final version](#) written by the UCS on the GBR:

### ***“Higher temperatures and ocean acidification threaten reefs***

*The biggest threat to the GBR today, and to its ecosystems services, biodiversity, heritage values and tourism economy, is climate change, including warming sea temperatures, accelerating rates of sea level rise, changing weather patterns and ocean acidification. Coral reefs worldwide are being directly impacted by warming waters and ocean acidification, and climate change is exacerbating other localized stresses. Ocean acidification is occurring because of increased levels of carbon dioxide in the atmosphere. A significant portion of this CO<sub>2</sub> is being absorbed by the oceans and the resulting increases in seawater acidity reduces the capacity of some marine life, such as corals, to build their calcium carbonate based skeletons. Significant drops in coral growth rate have been recorded in the last two decades for massive Porites corals on the Great Barrier Reef.*

### ***Worst ever coral bleaching***

*Other significant threats to the reef include coastal development, agricultural run-off pollution, port-based shipping activities, illegal fishing and outbreaks of the coral-eating crown-of-thorns starfish. Assailed by multiple threats, the status of the GBR has been assessed as being poor and deteriorating. Half of its coral cover has been lost over the last three decades. Unusually high sea temperatures have caused nine mass coral bleaching events on the GBR since 1979, and until this year, the worst had been in 1998 and 2002 (Great Barrier Reef Marine Park Authority 2012, Steffen et al 2009, Hughes et al 2015). But higher water temperatures and a severe El Nino have been pushing corals into the danger zone all over the world in 2015-16, and the Great Barrier Reef is currently suffering the most severe bleaching episode ever recorded.*

*Coral bleaching occurs when higher than usual maximum temperatures ... [description of coral bleaching mechanism snipped — kh]. All indications are that bleaching events will become more frequent and tropical storms more intense with continued global warming, and that this combined with a continued trend in warming water and ocean acidification will be massively detrimental to the GBR. The current bleaching episode has affected more than 90% of the reef, with the worst damage being in the northern region where surveys have confirmed 50% mortality in some places. ....”*

The Australian Government’s Environment Department officially responded:

*“The World Heritage Centre initiated contact with the Department of the Environment in early 2016 for our views on aspects of this report.*

*The department expressed concern that giving the report the title ‘Destinations at risk’ had the potential to cause considerable confusion. In particular, the world heritage committee had only six months earlier decided not to include the Great Barrier Reef on the in-danger list and commended Australia for the [Reef 2050 Plan](#).*

*The department was concerned that the framing of the report confused two issues – the world heritage status of the sites and risks arising from climate change and tourism. It is the world*

*heritage committee, not its secretariat (the World Heritage Centre), which is properly charged with examining the status of world heritage sites.”*

These events in the GBR War have taken place this month, in the last couple of weeks. Salvo and response. Two of these stories have been reported here at WUWT: [here](#) and [here](#).

The latest round of El Niño coral bleaching events brought headlines:

[Coral bleaching hits 93% of Great Barrier Reef: scientists](#) by Madeleine Coorey — April 20, 2016 – Yahoo News online

*“Sydney (AFP) – Australia’s Great Barrier Reef is suffering its worst coral bleaching in recorded history with 93 percent of the World Heritage site affected, scientists said Wednesday, as they revealed the phenomenon is also hitting the other side of the country.*

*After extensive aerial and underwater surveys, researchers at James Cook University said only seven percent of the huge reef had escaped the whitening triggered by warmer water temperatures.2016”*

[Is this the end of the Great Barrier Reef?](#) — April 8, 2016 by Tom Arup — Environment editor, The Age

[Study: Over 90% of Great Barrier Reef suffering from coral bleaching](#) by Euan McKirdy, CNN Wed April 20, 2016

*“At some reefs, the final death toll is likely to exceed 90%. When bleaching is this severe, it affects almost all coral species, including old, slow-growing corals that once lost will take decades or longer to return.”*

[Only 7% of the Great Barrier Reef has avoided coral bleaching.](#) Media Release — 20 April 2016 — issued by the [ARC Centre of Excellence for Coral Reef Studies](#) at James Cook University

*“The final results of extensive aerial and underwater surveys reveal that 93% of the reef has been affected. .... “We’ve never seen anything like this scale of bleaching before. In the northern Great Barrier Reef, it’s like 10 cyclones have come ashore all at once,” says Professor Terry Hughes”*

Massive salvos from the one faction, to which the response was:

[The facts on Great Barrier Reef coral mortality](#) — 03 June 2016 – the results from a survey of the GBR by [Australian Institute of Marine Science](#) and the [Great Barrier Reef Marine Park Authority](#)

*“We’ve opted to release results ahead of final completion of surveys because of widespread misinterpretation of how much of the Reef has died,” he said.*

*“Our aim is to bring the information from all scientific monitoring into a single picture in the coming months.*

*“We’ve seen headlines stating that 93 per cent of the Reef is practically dead. We’ve also seen reports that 35 per cent, or even 50 per cent, of the entire Reef is now gone.*

*“However, based on our combined results so far, the overall mortality is 22 per cent — and about 85 per cent of that die-off has occurred in the far north between the tip of Cape York and just north of Lizard Island, 250 kilometres north of Cairns.*

*“Another round of surveys is scheduled for August to October to assess survivorship, before a final assessment is published.”*

*The Australian’s Environment Editor, Graham Lloyd, launches another strike-back on June 4, 2016, with this piece: [“Great Barrier Reef: scientists ‘exaggerated’ coral bleaching”](#) [may appear paywalled for some]*

*“Activist scientists and lobby groups have distorted surveys, maps and data to misrepresent the extent and impact of coral bleaching on the Great Barrier Reef, according to the chairman of the Great Barrier Reef Marine Park Authority, Russell Reichelt. “*

*“The political debate and the [release of the authority’s survey results](#) highlights a growing conflict between the lead Barrier Reef agency and the National Coral Bleaching Taskforce headed by Terry Hughes.*

*“Dr. Reichelt said the authority had withdrawn from a joint announcement on coral bleaching with Professor Hughes this week “because we didn’t think it told the whole story”. The taskforce said mass bleaching had killed 35 per cent of corals on the northern and central Great Barrier Reef.*

*“Dr Reichelt said maps accompanying the research had been misleading, exaggerating the impact. **“I don’t know whether it was a deliberate sleight of hand or lack of geographic knowledge but it certainly suits the purpose of the people who sent it out,”** he said. [emphasis mine –kh]*

*“This is a frightening enough story with the facts, you don’t need to dress them up. We don’t want to be seen as saying there is no problem out there but we do want people to understand there is a lot of the reef that is unscathed.”*

*“Dr Reichelt said there had been widespread misinterpretation of how much of the reef had died.*

*“We’ve seen headlines stating that 93 per cent of the reef is practically dead,” he said.*

*“We’ve also seen reports that 35 per cent, or even 50 per cent, of the entire reef is now gone.*

*“However, based on our combined results so far, the overall mortality rate is 22 per cent — and about 85 per cent of that die-off has occurred in the far north — between the tip of Cape York and just north of Lizard Island, 250km north of Cairns. Seventy-five per cent of the reef will come out in a few months time as recovered.”*

We see that in just the first six months of this year alone, the Great Barrier Reef has been declared mostly dead and/or doomed by various sources, including a major government reef science group, the National Coral Bleaching Taskforce headed by Terry Hughes. The government agency with responsibility for the reef and the surrounding protective marine park, the Great Barrier Reef Marine Park Authority, cries foul, speaks of “deliberate sleight of hand” and misrepresentation and says simply that things are not nearly as bad as portrayed by activists.

Our lead story, featuring Professor Peter Ridd, highlighted his personal attempts at holding the researchers involved in reef studies to a high standard of accuracy and transparency, whistleblowing what are clear (to him) examples of exaggeration and activism-in-place-of-science. He is rewarded by his University, which is also the host of the Terry Hughes’ *National Coral Bleaching Taskforce*, with censure for “*failing to act in a collegial way and in the academic spirit of the institution*”. James Cook University has not announced any intention of investigating charges of scientific misconduct — neither in response to Dr. Reichelt or Professor Ridd.

As we saw in Part 1 of this series, [The Salt Wars](#), on one side of the GBR Wars, we have a number of groups comprising scientists, government groups and agencies (Australian), UN agencies, and outright activist/advocacy groups — many having revolving door membership with one another — whose main message is something along the lines of “The Great Barrier Reef is now or will soon be ruined, a loss to all mankind, and it is the fault of the humans. Billions must be spent to ensure that it is protected and human activity, of various types depending on the voice, must be curtailed, including all burning of fossil fuels.” As is common with all science issues in which advocates see the need for urgent action — the we-must-DO-something approach — every adverse effect is framed as a serious threat that has led or will lead to calamity. As the GBR fight is deeply embedded in Australian national politics, the GBR Wars get dragged in a wide and dizzying variety of other local and regional issues.

On the other hand, there are reef scientists and marine biologists like Peter Ridd; the calmer head of the GRBMP, Dr. Richard Reichelt; and a handful of Australian journalists critical of advocacy science. Primarily, this side of the War wants the data to be accurate, evidence-based, non-biased and truly representative of the actualities found across this vast natural ecosystem. This side riles against calamity-based advocacy reporting. None of these players are insisting that “all is well”...rather they try to lay out the challenges that face the reef, acknowledge those challenges which could be mitigated by changes in human practices and policies and focus on trying to understand the complex, complicated, intertwined biological system which created the reef over the last 15,000 years and generally accept that the GBR and its protection-by-policy under continued expansion and development of human society onshore represents a “wicked problem”.

And then there are the scientists that study science itself, among them a group headed by Carlos M. Duarte, lead author of [“Reconsidering Ocean Calamities”](#) published in the journal *BioScience* December 2014.

Quoting this paper (which does not specifically address the GBR Wars):

“The previous discussion of the forces that enter into play to perpetuate the perception of anthropogenic ocean calamities identifies a failure of current processes to fully comply with Merton’s (1973) norms of science. In order to progress, challenges to these calamities necessitate a strong inference approach. Foremost, a failure to support organized skepticism, which must be underpinned by a fair but rigorous peer-review system, is largely responsible for the perpetuation of the perception of some of the calamities, in cases in which these may be unsupported by robust inference or observations. Organized skepticism requires that the scientific community concerned with problems in the marine ecosystem undertake a rigorous and systematic audit of ocean calamities, with the aim of assessing their generality, severity, and immediacy. Such an audit of ocean calamities would involve a large contingent of scientists coordinated by a global program set to assess ocean health. This also requires funding to collect sufficient data and that they be made openly available, because only 1% of ecological data are currently available after the publication of the results. The analysis illustrated here provides a model of the elements involved in such an exercise. However, disinterest is also compromised by the set of rewards that enter into play for research that identifies or supports calamities, because this is most likely to be published in top journals that seek media impact from their content or to receive public funding.”

Overall, in Australia, the Great Barrier Reef issue is nearly always seen being used as a “political cudgel” – by both sides — something with which to hit “the other side” over the head in attempts to achieve some political/social/environmental goal. The green leaning advocacy groups use the threat of “threats to the GBR” in their attempts to stop development in Queensland (which adjoins the GBR), particular of the coal industry and Big Agriculture there. Environmental groups latch on to the “global warming causes high sea surface temperatures which bleach reefs” message to carry forward their political and social goals. Scuba diving associations straddle the fence—they want to “save the reef” but must admit, from personal experience, that it is in pretty good shape, albeit harmed by recent coral bleaching.

This has been going on for years and years – all of the above occurs in a period of only three or four months, and represents a very small fraction of the thrust, parry, and counter-thrust in even that short time period. Every study or report about the reef is the subject of argument and controversy, the proffered facts are questioned and countered, opinions are presented as fact, fact claimed to be opinion and personalities are besmirched.

In the GBR Wars, we find a single government agency — the Great Barrier Reef Marine Park Authority – charged with the protection of a natural phenomenon the size of the US State of

~~Vermont~~ New Mexico which stretches approximately 2300 km along the coast of Queensland in north-eastern.

The [official map](#) clearly shows the scope of the situation. What you can't see here in this smaller version (click the link to see the original in a new tab or window) is that the GBR Marine Park boundary has little exclusion zones extending out from the harbors of the major population centers....had it not, every single action and decision regarding harbors, shipping, port development and the like would come under the scrutiny and regulations of the Marine Park. As it stands, those decisions and actions all have to take into account any and all possible effects on the marine park and the reef and local actions become "causes" – in short, simple things can become very complicated. Part of the Park Authority's responsibility extends to the entire Catchment Area, the land area from which water flows to the same body of water, in this case the GBR Marine Park, giving the Authority an interest in activities on land as well as in the sea.



[Link to full sized map.](#) (added 10:27 Eastern time, 20 June '16)

As Australia attempts to manage and protect the reef, its scientists and scientific bodies carry on a seeming endless battle over even the *basic facts* concerning the condition of the reef and marine park – leaving policy makers and the public to 1) pick one or the other polarized viewpoints regardless of the facts or 2) scratch their heads in bewilderment, or 3) dismiss science and scientists are just another tool of politicians and advocacy groups. Naturally, the on-the-ground situation is much more complicated, with individuals and groups staking out positions and viewpoints spread across a broad spectrum of understandings and approaches.

Australia has done a very commendable job in establishing the GBRMP, laying out reasonable and [science-based long-term plans and goals](#) and establishing monitoring mechanisms to judge progress and effectiveness. Even the sometimes-overzealous UNESCO acknowledged this and declined to list the GBR World Heritage Area as “in danger” (as an [In-Danger listing](#) would have been a huge embarrassment, the Australian government lobbied long and hard, and successfully, to avoid it).

### **What We Know About The Great Barrier Reef:**

1. The Great Barrier Reef, and the surrounding protective Marine Park, covers an area of 344,400 km<sup>2</sup> or 134,000 mi<sup>2</sup>, about the size of the State of ~~Vermont~~ New Mexico or the nation of Italy, stretching 2300 km/~~14,500~~ 1,430 mi [h/t reader [marchesarosa](#)] from the north-eastern tip of the Australia continent south along its eastern shore, approximately the same distance as from Canada to Mexico along the western shore of the United States.
2. Like all tropical reef systems, it is a complex mixture of life forms associated with calcifying corals and the structures they build over time forming a ridge of living coral, coral skeletons, and calcium carbonate deposits from other organisms such as calcareous algae, mollusks, and protozoans.
3. Like all other coral reefs, the GBR is adversely affected by tropical cyclones which do physical damage to near-surface reefs, coral bleaching events, coral diseases, sedimentation from shore or surrounding sea beds, invasive species, disturbances caused by tourism, outbreaks of competitors or predators (such as the [Crown of Thorns starfish](#), a major problem in some areas of the GBR), over-fishing and depletion of reef-beneficial species, destructive fishing practices (dynamite, cyanide, targeting species for the saltwater aquarium trade), pollution of various kinds and from various sources (mostly man-made) and ship collisions (any contact is physically destructive and serious collisions often cause local pollution – fuels, oils, and ship contents — and leave wrecks that over time become incorporated into the reefs and thus become tourist attractions). Some of these factors can be avoided, reduced, or mitigated by proper management policies. Some cannot.
4. The establishment of the Great Barrier Reef Marine Park Authority and its associated bureaucracy, regulations, rules, long-term management plan and an effective system of

monitoring the reef system represents an encouraging level of engagement by the Australian government.

5. While many believe that global warming/climate change/ocean acidification will cause unavoidable irreparable damage to coral reef systems around the world, including the GBR, and while coral bleaching events are known to be caused by extreme sea surface water temperatures (such as those recently produced by the 2015-2016 El Niño), the science on the broader issues are subject to a great deal of uncertainty.
6. The GBRMP covers not only the reefs, but the inshore waters and all their habitats and inhabitants – thus, like in Florida in the USA, there are concerns for sea grass beds, inshore fish species, marine turtles, marine mammals (whales, dolphins, and the [dugong](#) (Australia's relative of Florida's [manatee](#)) and rules and regulations established to protect them.
7. From a longer perspective, it pays to remember that the reef has survived unrelenting storms, huge variations of weather and climate, naval battles, flood-born sedimentation and the myriad insults from invasive species, changing biotas and everything else Nature has thrown at it during its long history.

### **What We Know About GBR Politics:**

1. “It’s a mess, meets the test.” (h/t Pete Seeger: [lyrics](#))
2. Australian citizens overwhelming support preservation and management of the GRBMP – the devil, as the saying goes, is in the details.
3. Facts, policies, and opinions surrounding the state of, the preservation of, the management of the Great Barrier Reef and the GRB Marine Park are a continuing feature of scientific and political controversy in Australia, with warring government agencies, academic bodies, individual scientists, politicians and political parties of all types and stripes, advocacy groups (social, environmental, political) vying for headlines in the overly cooperative Australian press and broadcast media, in which disaster, calamity, scandal and controversy in high places are the order of the day.
4. Unlike some other modern science wars (the Salt Wars or the Climate Wars, for instance), there is no single policy remedy entrenched in the narrative of the “proponent” side, but rather a strident yet vague insistence that things are not going well, that a calamity looms, and that something drastic must be done at once — but what exactly that is depends on the group (out of many) speaking. Much of the current foment aligns with the anti-fossil-fuel/AGW policy demands, but anti-capitalism, anti-development, anti-coal, anti-Big-Agriculture, and other anti- groups get involved in the minutiae of GBR management and politics.
5. There appears to be some scientific sloppiness – some White Hat bias, some ~~Nobel~~ Nobel Cause bias, some publication bias, some bias deriving from social narratives – across the whole field of Reef Sciences, particularly in Australia itself.
6. The overriding weirdness of the GBR Wars is that everyone wants the same thing – a healthy, productive, brilliant Great Barrier Reef system, and supports its protection and management – yet what we see from the outside are endless battles among those who should be working together towards this common goal.

In the recent incidents highlighted in the beginning of this essay, we see one scientist call out a group of others for what appeared to him to be scientific misconduct at worst and widely biased reporting at best and he is ultimately censured by his University for it. The Australian government demands, and gets, that all mention of the GBR be withdrawn from a United Nations sponsored report, written for UNESCO by an acknowledged advocacy group with its own viewpoint to promulgate, fearing that the negative reporting would damage Australia's tourist industry. The GBRMP authority, established by the government to protect and manage the GBR, withdraws from a planned joint statement regarding the recent coral bleaching event, originally to be issued by itself and the ARC Centre of Excellence for Coral Reef Studies at James Cook University, and publicly asks if the ARC study was based on "*deliberate sleight of hand or lack of geographic knowledge*".

The Australian people, their government, and the rest of the world are left mystified by the spectacle – unable to discover the true state of affairs concerning the GBR, which stands as one of the wonders of our natural world. This state of affairs is the unfortunate result of yet another science war – the Great Barrier Reef Wars.

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#### Author's Comment Policy:

As always, I will be glad to answer your questions about the Great Barrier Reef Wars – which I have followed since the 1990s, when I returned to the Caribbean and experienced tropical reefs almost daily for ten years.

I realize that many readers here will want to move on immediately to discuss the Climate Wars – one of the distinctive science wars of our day. The GBR War is tied by association with the Climate Wars, nonetheless, I ask again that you please try to restrain yourselves – we'll get to that later on in the series.

Many of you will already see parallels and similarities between the two science wars discussed so far. I encourage you to point them out in the comments.

It is my intention that the last essay in the series will be an attempt to layout a coherent pattern of modern science wars and maybe suggest ways that the different science fields themselves can break these patterns and return their specific area of science back to the standards and practices that should exist in all scientific endeavors.

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