

**Senate Enquiry Submission - Dr Alison Jones**

Identification of leading practices in ensuring evidence-based regulation of farm practices  
that impact water quality outcomes in the Great Barrier Reef

Attention:

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**Qualifications and rationale for the submission**

Thank you for your letter dated 9/10/2019 inviting me to contribute to the senate inquiry  
into farming practices and water quality outcomes in the Great Barrier Reef.

I am an independent research scientist based in the Keppel Islands. I have over 15 years of  
experience in coral ecology and have worked extensively in dive related tourism on the  
Great Barrier Reef. I have a cattle property that is located within a few kilometres of a  
wetland that feeds directly into Keppel Bay.

I have qualifications as a base metals chemist in the mining industry, teaching and dive  
tourism. I have experience in coral reef monitoring including impact assessment of  
bleaching, floods and a ship grounding. I have a sound portfolio of marine research, tourism  
and community engagement. I have worked as a reef ecologist and coral physiologist on the  
Great Barrier Reef and in coral health assessment in relation to ship grounding in the  
Western Pacific region. My research interest is on establishing a sound body of work to  
inform management of inshore reefs in the southern GBR, particularly in relation to the  
Southern Great Barrier Reef Keppel Islands region. I have many years of direct experience  
with both land and marine community conservation groups (through Capricorn Conservation  
Council and my own proactive marine community group Keppel Crew  
<https://kiccinc.wordpress.com>).

I do not consider myself a qualified or experienced water quality scientist but I have conducted water quality and coral health assessments in relation to the 2010-2011 floods in Keppel Bay (largely a grazing catchment), which the largest easterly flowing catchment feeding into the GBR lagoon inshore reefs. (Kennedy *et al*, 2012).

As an experienced coral research scientist with recognised independence I can objectively assess the accuracy and veracity of other scientist's work or recognise where I can or cannot contribute meaningfully.

I believe that I can contribute well-established peer-reviewed facts about the impacts of floods and bleaching on Keppel Bay coral reefs.

As a small beef cattle producer I have first hand experience of grazing practises in the Fitzroy Region.

### **Terms of Reference of the Enquiry**

**The identification of leading practices in ensuring evidence-based regulation of farm practices that impact water quality outcomes in the Great Barrier Reef, with particular reference to:**

- a. the existing evidence-base on the impact of farm water runoff on the health of the Great Barrier Reef and catchment areas;
- b. the connectivity of farm practices throughout the Great Barrier Reef catchment areas to water quality outcomes in the Great Barrier Reef Marine Park;
- c. relevant legislation and regulation, including in relation to impacts of water quality, farm management and soil runoff;
- d. proposed changes to regulations that would impact on farm productivity and the potential benefits and costs of such proposed regulation;
- e. the wider economic and social impact of proposed regulations to restrict farm practices; and
- f. any related matters.

### **Key Points**

**The existing evidence-base on the impact of farm water runoff on the health of the Great Barrier Reef and catchment areas.**

### ***Opinion***

Keppel Bay reefs are shaped by the influence of floods from the Fitzroy Basin catchment. Pesticides, whilst having the potential to impact marine organisms, are not found at levels high enough to affect corals during floods (when they are at their highest level). But more importantly, it is fresh water that kills corals and other marine life in Keppel Bay during a

major flood event. The effects of pesticides are irrelevant. There have been no studies of pesticide impacts to corals in the environment that can directly link pesticide levels to coral health declines. There is a gradient of coral health with distance from the mouth of the Fitzroy that correlates with water quality but this could equally be due to sedimentation and/or fresh water impacts.

I emphasise the impact of other point and obtuse sources of water runoff because my own audit of publications relating to Keppel Reefs available on my website ([www.keppels.com.au](http://www.keppels.com.au)) has underlined that these other sources may also contribute significantly to anthropogenic water quality declines (nitrogen and phosphate). There is however still no **direct** link to major coral health impacts on a wide scale from anthropogenic sources. The main anthropogenic influences on coral reefs in Keppel Bay are floods, but anchor damage, overfishing and coral collecting also impact and prevent coral reef recovery after natural disturbance.

In Keppel Bay, the existing body of evidence points to sediment impacts to coral reefs as occurring largely from re-suspension of sediment from geological erosion processes. Keppel Bay corals are well adapted to these conditions having evolved in response to them.

***Solution – with respect to the proposed changes to regulations***

I believe that grazing practises should be changed significantly to prevent soil erosion. However, these changes should be driven by a need to preserve topsoil and improve land management for better agricultural and environmental outcomes rather than to improve the health of inshore reefs, which are shaped by floods. As such, I support the proposed changes in grazing practises in the Fitzroy Region with the following caveats:

More funding being diverted from water quality assessment and monitoring towards helping graziers to implement these changes.

No further diversion of GBR-focused funds to natural resource management agencies or requirements for education and awareness campaigns for farmers.

Funding should be made directly available to graziers and other industries and accredited advice services fully funded to the value appropriate to the size and potential impacts of poor management practises to environmental and agricultural outcomes.

Intervention for gully erosion needs to be addressed urgently and funded by government.

I would like to see consideration of vetiver grass as an erosion and water quality control measure. There is a strong body of evidence for its success in other countries and in Queensland, it is now being incorporated by major industry (mining and transport) in major infrastructure projects. Again, funds made available for farmers to implement its inclusion as one of a range of strategies.

Widening of these regulations to also include local government and other industries.

In relation to grazing practise in the Fitzroy Region, Keppel Bay coral reefs are well adapted to sediment re-suspension. Sediment in Keppel Bay is increasing and anthropogenic sources are contributing but at a much smaller scale to those natural processes that have occurred over millennia. I am unaware of studies identifying sediment from anthropogenic sources versus re-suspension and natural erosion processes that have been occurring for millions of years.

I would like to see studies of key reef building coral Photosystem II inhibition versus pesticide presence over time frames of years (sediment and water column) on inshore reefs.

## **References**

Karen Kennedy, Michelle Devlin, Christie Bentley, Kristie Lee-Chue, Chris Paxman, Steve Carter, Stephen E. Lewis, Jon Brodie, Ellia Guy, Suzanne Vardy, Katherine C. Martin, Alison Jones, Robert Packett, Jochen F. Mueller, The influence of a season of extreme wet weather events on exposure of the World Heritage Area Great Barrier Reef to pesticides, Marine Pollution Bulletin, Volume 64, Issue 7, 2012

Jones AM, Berkelmans R (2014) Flood Impacts in Keppel Bay, Southern Great Barrier Reef in the Aftermath of Cyclonic Rainfall. PLOS ONE 9(1): e84739.

<https://doi.org/10.1371/journal.pone.0084739>