



11 April 2024

9(2)a

Dear 9(2)a

Thank you for your email of 20 February 2024 requesting information on scientific evidence and the *Our Atmosphere and Climate 2023 report* (OIAC23), under the Official Information Act 1982 (the Act).

The Ministry for the Environment (the Ministry) understands you are seeking clarification on whether the sources cited in OAC23 adequately support our assessment that states 'tropical cyclones will increase in severity' over the South Pacific basin. You have also questioned whether appropriate sources were used.

To support our assessment "The frequency of tropical cyclones is projected to decrease slightly over the South Pacific basin, with a predicted increase in severity (Bodeker et al, 2022, Chand et al, 2022)", we incorporated two pieces of evidence. Chand et al. 2022 discusses the decrease in tropical cyclone (TC) frequency (as measure by annual number of TCs) over the South Pacific basin, while Bodeker et al. 2022 discusses the increase in severity (as measured by wind speed and maximum precipitation).

We used the two following paragraphs from Bodeker et al. 2022 to support our assessment that tropical cyclones will "increase in severity":

P33: "an increase in extreme wind speed in New Zealand is projected over the South Island and the southern part of the North Island by mid- and end of century for all RCPs, which is related to **projection of the intensification of regional cyclonic storms** (MfE, 2018)."

P33 "AR6 reported with *high confidence* that **the average and maximum rain rates associated with tropical cyclones**, extratropical cyclones, and atmospheric rivers across the globe, and severe convective storms in some regions, **increase in a warming world.**"

Chand et al. 2022 acknowledge that their analysis has limitations to make conclusions about TC intensity. Instead, the authors reference Knuston et al. 2019 (Part I), who report "an increase in the proportion of severe storms with anthropogenic-induced warming". Without further context, we agree that reporting an increase in the proportion of severe storms does not provide evidence for increased average storm intensity, although it does not contradict such assessment either. However, Knuston et al. 2019 (Part I) provides further evidence supporting increases in the global average intensity of the strongest TCs. While Knuston et al. 2019 (Part II) (also cited in Chand et al. 2022) provides evidence for an increase in TC precipitation rate and wind intensity globally.

We are confident that collectively, the findings of Bodeker et al. 2020 support our assessment that tropical cyclones will 'increase in severity', while Chand et al. 2022 does not present evidence to the contrary.

While we recognize the value of using 'grey literature' to support certain aspects of our report, we acknowledge that referencing a press release from NIWA was inappropriate in this instance. Instead, we should have cited Bodeker et al. 2022. We thank you for identifying this and raising it with the Ministry and we will make sure to update the report as soon as possible. However, it's important to emphasize that this oversight does not undermine the validity of our assessment, which is reinforced by the additional sources cited within OAC23.

You have the right to seek an investigation and review by the Ombudsman of my decision on this request, in accordance with section 28(3) of the Act. The relevant details can be found at: [www.ombudsman.parliament.nz](http://www.ombudsman.parliament.nz).

Yours sincerely

A handwritten signature in blue ink, appearing to read 'MH d.', is positioned above the typed name and title.

**Megan Hurnard**  
General Manager  
Data, Evidence and Insights