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Strengthening tropical influence on heat generating circulation over Australia through spring

by Roseanna C. McKay, Julie M. Arblaster, and Pandora Hope

### **Author response to technical corrections**

The authors thank the two reviewers and the editor for their thorough evaluation of our manuscript. The suggested technical corrections have now been made and improved the manuscript as a result. The reviewers' and editor's comments are in bold and our responses are in plain text.

### **Editor**

#### **line 188: missing period**

Corrected

#### **line 577, and throughout manuscript: instead of "heat mechanisms", I would suggest "heating mechanisms"**

Changed throughout

#### **check throughout manuscript, e.g. lines 218, 582, 504: "SAM" -> "the SAM"**

Changed throughout

#### **line 216: clarify "(x-1)" when using it the first time**

Added "(denoted by x-1)" to line 222 (216 in previous version)

#### **lines 495/496: "correlate" with what? please specify**

Apologies, "with temperature" has been added

#### **line 500: missing verb**

Corrected to include, 'is'. Sentence structure has also been changed for clarity.

#### **line 502: "the tropics promotes" -> "the tropics promote"**

Corrected

#### **line 510 - 511: please check grammar**

Sentence has been changed to, "However, the upper-level atmospheric anomalies through spring are broadly consistent with IOD-forced wave trains identified in the literature, with shifts poleward or equatorward as discussed above (Cai et al., 2011; McIntosh and Hendon, 2018; Wang et al., 2019)." On lines 561-564 of edited document.

#### **line 519 - 520: please check grammar**

Sentence has been changed to "To test this idea, wave activity flux is calculated from regressions of the three dynamical heating mechanisms onto 200Z (Sup. Fig. 7). As spring progresses, WAF associated with the heating mechanisms indicates greater Rossby wave

propagation out of the tropics than the extratropics. Waves appear to propagate along the jet waveguide toward Australia, reflecting the growing relationship between the tropics and temperature.” On lines 568 to 574 of edited document.

**line 557: missing space**

Corrected

**Review 1**

**The authors addressed all my previous comments satisfactorily.**

**The introduction has been shortened and readability improved.**

**Apologies to have missed the information that data was detrended. There is no need to move that sentence to a different paragraph. It can be merged with the previous sentence (L.159).**

Sentence has been combined with following sentence to create a single short paragraph instead of a single sentence.

**Please revise the text to add final ‘.’ at the end of sentences, e.g. L.141, L.159, L.188, Fig.2 caption.**

Corrected.

**The manuscript can then be accepted for publication in my view.**

**Review 2**

**Minor/Technical:**

**I. 141: Missing full stop.**

Corrected

**I. 159: Missing full stop. Please consider to join the single-sentence paragraphs to one paragraph.**

Corrected and two short paragraphs combined into one.

**I. 355: K\_s instead of Ks.**

Changed

**I. 374 and elsewhere: K\_s instead of Ks.**

Changed.

**I. 477: Please revise this sentence: "...are influenced differently by the different influence..." reads somewhat awkward.**

Agreed and changed to “Overall, it appears that the heating mechanisms associated with high maximum temperatures in spring are subject to the changing influence of the extratropics and tropics on the local atmospheric circulation features through spring.” On lines 512 – 515 of edited document.

**I. 489: Please specify which oceans you are referring to. I guess it is the subtropical ocean regions? At least advection of air from the Southern ocean would still lead to a cooling.**

Agreed and changed to ‘subtropical’ oceans

**Figure captions and text: Please double-check format of SI units. Quite often a space is missing. E.g.,  $ms^{-1}$  should be replaced by  $m\,s^{-1}$ .**

Corrected