

Response to reviewer comments on “Crustal structure of southeast Australia from teleseismic receiver functions” (manuscript se-2020-74) by Bello et al.

5th January 2021

We thank Reviewer #1 for the additional minor comments on our manuscript. Below, we include a response to each point that has been raised.

Note: Reviewer comments are in Blue text, and author responses are in black text. Line numbers refer to the marked up version of the manuscript.

Reviewer #1

Comment: l.20 and 22: Capitalization should be consistent (VanDieland vs. Vandieland)

Response: The correct term is “VanDieland”. We have undertaken a string search of the entire manuscript to ensure that capitalisation is consistent throughout (e.g. line 22).

Comment: l.83: I have never seen the term “turbidite thrust system”, and I frankly do not understand what it is supposed to mean. As far as I can see, the cited paper (Gray and Foster, 2004) also does not use this term

Response: Turbidites are often found in deep water fold and thrust belts at convergent margins. In this case, we were referring to the incorporation of turbidites in a thrust system caused by the closure of a marginal basin. However, since this is not a key part of the Gray and Foster model, we have just deleted the term to avoid confusion (see line 83).

Comment: l.88: contain + s

Response: This has been corrected i.e. “contain” has been replaced with “contains” - see line 88.

Comment: l.107: employed instead of deployed?

Response: We have implemented this change (see line 107).

Comment: l.333: The sentence starting with “Looking” should, as far as I can see, not be part of the itemized list any more

Response: This is correct. We have moved this sentence to the end of the paragraph below – see lines 343-345.

Comment: l.400: crustal thickness (-es)

Response: We have changed “thicknesses” to “thickness” as requested (see line 405).

Comment: l.406: since the relationship between Poisson's ratio and v_p/v_s is not discussed, this statement is confusing. Best reformulate to v_p/v_s .

Response: This statement has been reformulated in terms of V_p/V_s as suggested – see lines 410-411.

Comment: l.427: should be a lower case k in ka

Response: This has been corrected – see line 432.

Comment: l.428 and before: check for consistency in having “ v_p/v_s ” italicized or non-italicized

Response: We have checked (and corrected where necessary) all occurrences of V_p/V_s to ensure that they are italic.

Comment: l.434/517/521: more Vandielands with lower case d..

Response: These have all been corrected.

Comment: l.439: should be southeast Australia I guess

Response: Yes, this was a typo, and “Asia” has been replaced with “Australia” - see line 445.

Comment: l.782: spelling of modified

Response: This has been corrected – see line 816.

Comment: Figure 9: Why are the RF traces for stations BA13 and BA17 cut off at 0s, whereas the ones for the permanent stations (Figures 7+8) are not? Is this simply a plotting artefact, or does it indicate differences in the processing? (same for the Supplementary Figures)

Response: Yes, we used a different processing strategy for the temporary stations. This is now explained on lines 295-298.

Comment: Figure 10: caption needs to be updated; it describes stars and octagons, but the figure shows circles and triangles. One reference is misspelled (Shibutani)

Response: We have made the necessary corrections, including to the spelling of Shibutani – see lines 876-877.

Comment: Figure 12: This is a nice composite figure. However, the color scale seems to indicate that all shown velocities (or velocity differences) are v_p , while the shown crustal velocities are v_s from ambient noise tomography, hence v_s (if I understand correctly). This should be indicated, ideally with a second scale bar for these velocities.

Response: It is true that the crustal model derived from ambient noise is defined in terms of V_{sv} (vertical component data were exploited), but when it was used in conjunction with teleseismic P-wave arrival times, it was first converted to V_p , which is what is shown in this figure. The caption has been updated accordingly (see lines 892-895).

Comment: Figures S5-S8: can Moho picks be shown, just as in Figures 7-9?

Response: The Moho picks are now included in Figures S5-S8.

Comment: Figure S9: what are the pink stars and the numbers associated to them? This is not mentioned in the caption. Also, it is not mentioned what red triangles (L1 to L15) are. Please clarify!"

Response: This has been clarified in Figure S9 as requested.