Response to Reviewer #1

The reviewer is thanked for their comments on the manuscript. The responses and proposed modifications are outlined below (in blue)

General comments:

This manuscript discusses in detail the influence of the fluctuation of the streamflow conductivity of the four basins in southern Australia on the separation results of the conductivity mass balance method, and also discusses the influence of the correction effect of the filtering method and the sliding minima method. In my opinion, the content of this manuscript is meaningful. It will help researchers analyze the differences between different baseflow separation results, and can guide the correction between different separation methods. I think this manuscript can be published after appropriate revisions. Since my mother tongue is not English, I did not comment on grammar, etc. Below are some of my suggestions.

These general comments indicate that the main message of the paper has been conveyed

Specific comments:

1) Line 32. "that that" may be repeated.

Yes, there should only be one “that”. This will be corrected.

2) Lines 37-39. “Some of these components … much older.” I think the meaning of this sentence may be inaccurate. It should be the infiltration of recent or ancient rainfall.

This sentence was awkward. What it was trying to convey was that rivers are fed by waters from within the catchment that have a range of residence times. It will be reworded along the lines of: “Some of the components of baseflow (e.g., bank return waters and interflow) have short residence times represent whereas others, notably regional groundwater, are generally much older.”

3) Line 141. “SC_b. is based on the SC of the river during low flows using two methods for estimating SC_b were used.” This sentence is confusing, please modify it.

Yes this is a poorly worded sentence. It will be reworded as: “SC_b. is based on the SC of the river during low flows; two methods for estimating SC_b were used”.

4) Lines 183-184. It is feasible to adopt the recommended value of recession coefficients. However, the recession coefficients of different watersheds are likely to have certain differences, and it can be easily determined through recession analysis. So I suggest you determine it through recession analysis.

Agreed. The recession constants were calculated for the individual catchments and can be used for the calculations. It makes little difference to the numerical results and no difference to the overall conclusions. The range of values was 0.92 to 0.95 with a median of 0.93 (which is what was used for the calculations in the paper).

5) Line 195, Figure 2. Lack of legend for baseflow conductivity.

Agreed. Legend will be amended

6) Line 230, Figure 4. The legend for points and lines is missing.

Agreed. Legend will be added

7) Line 247, Figure 5. The legend for the dots in different colors is missing.

Agreed. Legend will be amended