

Comment on **essd-2022-446**

Ian Moffat (Referee)

Referee comment on "A strontium isoscape of northern Australia" by Patrice de Caritat et al., Earth Syst. Sci. Data Discuss., <https://doi.org/10.5194/essd-2022-446-RC1>, 2023

General Comments:

Thank you to the authors for this important data set, which addresses an expansive deficiency in strontium isotope mapping in Northern Australia. The methodology of this study is robust, and it will provide an important tool to facilitate future research in this area.

Several aspects of this study are of particular note. The analysis of the relationship between the "top outlet sediment" and "bottom outlet sediment" is novel and expands the interpretability of this data set. The consideration of strontium isotope values compared to mineralisation is also a very interesting inclusion.

Specific Comments:

I suggest the authors make explicit that food tracing, provenance and archaeological applications of strontium isotope tracing (referred to specifically in lines 64-68) rely on bioavailable rather than "whole rock" values and so don't benefit directly from this data set.

The decision to analyse catchment outlet sediments is understandable given the availability of these samples from the National Geochemical Survey of Australia, however this methodology differs from most other strontium isoscape studies and has important implications for interpretation of these results. I suggest the authors elaborate on these issues, perhaps as a new section in the discussion.

The data set presented by the authors in this paper is extremely useful and interesting however it could be considerably enhanced by including the bedrock geology, age and stratigraphic unit (as summarised in Figure 6), notwithstanding that these samples have been collected from fluvial systems.

Technical Corrections:

Figure 1 is extremely small in the manuscript and the sample locations use the same colour as the Towns and Places, can I suggest this is revised to make it easier to view?