Interactive comment on "Combining colour parameters and geochemical tracers to improve sediment source discrimination in a mining catchment (New Caledonia, South Pacific Islands)" *by* Virginie Sellier et al.

Anonymous Referee #1

Received and published: 21 December 2020

The manuscript presents a sediment source tracking approach using several techniques; most notable are newer spectrophotometric approaches. I have included an annotated pdf with comments and editorial marks.

Identifying your approach that you use as "truth" in your analysis to compare other analyses too is critical here. I think you missed an opportunity here to convince the reader what truth is. Your Geochem approach appears to be the best approach alone; your two tables convince me of that alone. I would check for normality and run a two-sample test on your Geochem versus Geochem and color result.

Second, I think much more could be done to use element to element comparisons with tributaries and sources noted on scatter plots (different colors or symbols). Table 2 begs for such an approach. Element rations can also be useful here too. A Kruskal Wallace or ANOVA (depends on normality) of elements by trib or land use could id significant differences too.

It is not clear how your Mann Whitney test was used?

I worry your data is suffering from some multicollinearity, especially with the Stepwise approach. How was this handled/addressed?

Can you use linear discriminant analysis with cross validation to predict membership in a trib or land use?

Please also note the supplement to this comment:
https://soil.copernicus.org/preprints/soil-2020-48/soil-2020-48-RC1-supplement.pdf

Interactive comment on SOIL Discuss., https://doi.org/10.5194/soil-2020-48, 2020.