Biogeosciences
Discussions

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Interactive comment on "Commercial traceability of *Arapaima spp.* fisheries in the Amazon Basin: can biogeochemical tags be useful?" *by* L. A. Pereira et al.

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bg-2018-471 Commercial traceability of Arapaima spp. fisheries in the Amazon Basin: can biogeochemical tags be useful?

Comments

The manuscript is well written, has a proper and logical layout and makes a valid and valuable scientific contribution. The text can however benefit from minor editing (see notes below under editing).

The authors investigated a very complex river system draining an even more complex

geological setting. Sr isotope analyses is a good method for investigating such a system as it is mainly determined by the weathering of up-stream geology which is not expected to vary much within a 10 or even 50 year period. Please see: Jordaan, L.J., Wepener, W. and Huizenga, J.M. (2016). The strontium isotope distribution in water and fish within major South African catchments. Water SA, 42(2), 213-224. In this case very similar data was obtained in a smaller and more controlled river system but it confirms the underlying assumptions made by the authors for the Amazon system. Data gathering can be much expanded over a multi-year sampling period to include seasonal variation, if a further study is ever undertaken.

Using C isotopes is a good approach for this problem. It has however several more factors influencing isotope fractionation than Sr isotopes and should be used within the constraints of the technique, as the authors rightfully did. Data can be much expanded if a further study is ever undertaken.

The problem of obtaining fish samples with a known origin is not unique to this study and it is recommended that fish obtained from markets be treated with caution.

The value of this work lies in the fact that it can be extended to solve more than one issue. The biggest being the illegal use of protected natural fish populations. The techniques will work for other fish species as well and it will provide data as to the sediment load and erotional patterns of such large rivers.

Recommendation

The manuscript is recommended for publication.

Editing

Page 2 line 9: replace "certificate" with "characterize" Page 3 line 17: replace with: "The Amazon basin represents a dynamic and heterogeneous ecosystem extending over more the 45% of the surface area of South America." Page 3 line 18: replace: "geologic" with "geological" Page 3 line 20: replace with "These habitats are there-

fore some of the most biodiverse in the world, particularly in regard to the Amazonian freshwater fish fauna which are under pressure of degradation by dams, buildings, mining, land cover and global climate change" Page 6 line 12: replace "Inter laboratorian" with "Inter-laboratory" Page 6 line 13: replace "reapitability" with "repeatability" Page 7 Figure 2: replace "87/86Sr" with "87Sr/86Sr" (numbers in superscript) and use this notation consistent throughout entire document. Page 7 line 10: replace "The slice preparations were drilled per 6.8 mm interval" with "The slice preparations were drilled a 6.8 mm intervals" Page 7 line 18: replace "Also a test t was applied" with "A t-test was also applied" Page 9 Figure 4: replace "87/86Sr" with "87Sr/86Sr" (numbers in superscript) and use this notation consistent throughout entire document. Insert "87Sr/86Sr" (numbers in superscript) for part (b) of figure also. Page 9 line 8: replace "interindividual" with "inter-individual" Page 10 Figure 5: replace "87/86Sr" with "87Sr/86Sr" (numbers in superscript) and use this notation consistent throughout entire document. Insert "87Sr/86Sr" (numbers in superscript) for Central Amazon part of figure also. Page 11 Figure 6: replace "87Sr/86Sr" with "87Sr/86Sr" (numbers in superscript) Page 11 line 16: replace "(sample origin in a row, predicted origin in the column)" with "(sample origin rows, predicted origin columns)" Page 12 line 4: replace "(sample origin in a row, predicted origin in the column)" with "(sample origin rows, predicted origin columns)" Page 12 line 19: meaning unclear, please re-write sentence: "The role of food is more controversial as revealed by Sturrock et al. (2012) that reviewed significant or non-significant food up taking processes on the Sr isotopic composition of fish." Page 13 line 21: please confirm: "black water" or back water" and be consistent throughout document.

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