

REVIEW Journal: CP

Title: TERRIGENEOUS MATERIAL SUPPLY TO THE PERUVIAN CENTRAL CONTINENTAL SHELF (PISCO 14°S) DURING THE LAST 1100 yr: PALEOCLIMATIC IMPLICATIONS.

Author(s): F. Briceño Zuluaga et al.

MS No.: cp-2015-98

MS Type: Research article

Special Issue: Climate change and human impact in Central and South America over the last 2000 years

Review criteria

Principal criteria	Excellent (1)	Good (2)	Fair (3)	Poor (4)
<p>Scientific significance: Does the manuscript represent a substantial contribution to scientific progress within the scope of Climate of the Past (substantial new concepts, ideas, methods, or data)?</p>			X	
<p>Scientific quality: Are the scientific approach and applied methods valid? Are the results discussed in an appropriate and balanced way (consideration of related work, including appropriate references)?</p>		X		
<p>Presentation quality: Are the scientific results and conclusions presented in a clear, concise, and well-structured way (number and quality of figures/tables, appropriate use of English language)?</p>		X	X	

Access review, peer review, and interactive public discussion (CPD)

General comments:

The manuscript presented by Zuluaga et al. use grain size distribution of two laminated sediment cores collected off Peru to reconstruct terrigenous material supply to the Peruvian shelf over the last ~ 1100 yr at high resolution. Although the manuscript falls within the scope of CP, to my knowledge, it does not add novel information about the past climate of the area. Additionally, the manuscript lacks description of the sediments (at least a short lithological summary for both cores; lamination throughout? in part?), collection sites and detailed composite chronology. Moreover, the interpretation of grain-size data seems to be oversimplified for a continental shelf area that is geologically not that simple. More information on the physical setting of coring sites and transport mechanisms of particles from the continent needs to be provided.

In the full review and interactive discussion, the referees and other interested members of the scientific community are asked to take into account all of the following aspects:

1. Does the paper address relevant scientific questions within the scope of CP? **YES**
2. Does the paper present novel concepts, ideas, tools, or data? **NOT REALLY**
3. Are substantial conclusions reached? **NOT REALLY**
4. Are the scientific methods and assumptions valid and clearly outlined? **NOT REALLY**
5. Are the results sufficient to support the interpretations and conclusions? **It is not a self-sustaining paper**
6. Is the description of experiments and calculations sufficiently complete and precise to allow their reproduction by fellow scientists (traceability of results)? **NOT COMPLETELY; chronology not given; full range of grain-size not given.**
7. Do the authors give proper credit to related work and clearly indicate their own new/original contribution? **YES**
8. Does the title clearly reflect the contents of the paper? **YES**
9. Does the abstract provide a concise and complete summary? **YES**
10. Is the overall presentation well structured and clear? **YES**

11. Is the language fluent and precise? **NEEDS SOME WORK**
12. Are mathematical formulae, symbols, abbreviations, and units correctly defined and used? **YES**
13. Should any parts of the paper (text, formulae, figures, tables) be clarified, reduced, combined, or eliminated? **SEE BELOW, SPECIFIC COMMENTS**
14. Are the number and quality of references appropriate? **YES, although there seems to be too many references, and some are not relevant.**
15. Is the amount and quality of supplementary material appropriate? **NO. The suppl. Material should include the age model of both cores B040506 and G10-GC-01, and especially details on how the composite record was build. This is a critical point.**

Specific comments:

Although the authors present new data (i.e. grain-size) for the Pisco shelf area, I have 3 main concerns that need to be addressed before this manuscript can be considered for publication:

- 1) Physical setting of the collection sites needs to be given as well as a summarized sediment description. The manuscript lacks presentation of the sampling sites with respect to processes (other than eolian input) that may affect the transport of particles from the continent to the ocean (e.g., strong or weak bottom currents?, erosional processes, slumps/earthquakes, etc.). Moreover, the Salvattecchi et al. (2014 in CP) paper in its supplementary information reveals 2 slumps in core G-10, some clearly laminated sections and several banded intervals. X-radiographs of nine cores are shown in this publication (including G-10 and B-06), all of them showing intervals with slumps. Citing Salvattecchi et al. (2014 in Marine Geology vol 357): "... two possible mechanisms can explain the presence of the homogeneous sediments: slumps triggered by earthquakes and sediment instabilities, and/or sediment transported by strong bottom currents". ... "Another mechanism that can be responsible for the re-deposition of sediment from upslope in some portions of the cores could be related to changes in the intensity of the Poleward Undercurrent which is stronger during El Niño events". ... "All the cores evaluated in the present work show discontinuities and the addition of previously deposited material". With so many factors at play, isn't the interpretation of grain size in this manuscript somewhat oversimplified?

By the way, I could not find the reference to the frequently cited Salvattecchi et al. (2014) in the reference list.

- 2) Chronology. Detailed chronology for both cores used in this manuscript needs to be included as well as an explanation on how the composite record has been built. Given the issues raised in (1), this is critical! Please add X-radiographs of the cores and the composite, a table/fig. with the Pb210 and C-14 data, and the overlap/match between both cores.
- 3) Grain-size Analysis.
 - a) Authors should state the advantages/disadvantages of using the chosen method (Flow Particle Image Analyzer) over other techniques. This goes in hand with the question: is the >200 microns fraction not important off Peru, on a setting such as the continental shelf? If so, please tell us why.
 - b) Removal of opal. Have the authors checked that all opal was really removed? What is the opal content in Pisco sediments? (I believe these are sediments loaded with diatoms). Over the years it has become more and more evident that the removal of all opal from a sample is not an easy task. Please add a sentence or two about this issue in the methods section, making sure that the methodology employed has removed all opal from each sample.