Supplement of Clim. Past, 12, 787–798, 2016
http://www.clim-past.net/12/787/2016/
doi:10.5194/cp-12-787-2016-supplement


Climate of the Past
Open Access

*Supplement of*

# Terrigenous material supply to the Peruvian central continental shelf (Pisco, 14° S) during the last 1000 years: paleoclimatic implications

**Francisco Javier Briceño-Zuluaga et al.**

*Correspondence to:* Francisco Javier Briceño-Zuluaga (franciscojavier@id.uff.br)

**Stacked record.**

According to Salvatteci et al (2014), the cross-correlation of stratigraphic laminated sequences involves the identification of common biogeochemical features in the cores compared of the same study area. The common biogeochemical features are used as a correlation point between these. The biogeochemical shift at AD 1820±15 described by Gutiérrez et al., (2009) and Sifeddine et al., (2008) in all sediment cores in the area was used as stratigraphic anchored. Thereafter a visual examination of the X-ray images was made to prepare a correlation following the tone patterns produced by the difference in density of the laminae. The sediment core B14 (collected in the Pisco continental shelf too) was used as reference because this core were better defined and have most complete laminar sequence and is the best preserved (Figure 1S).

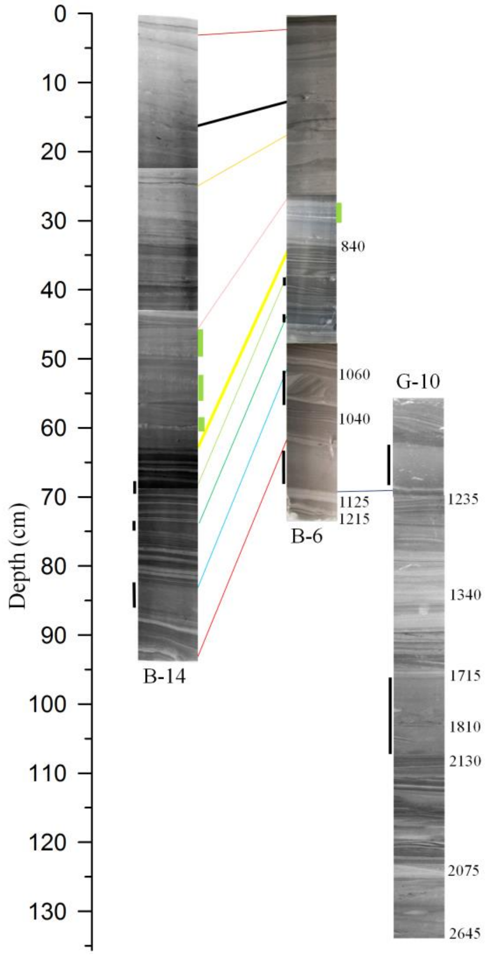


Figure S1: Cross-correlation of stratigraphic laminated sequences (SCOPIX images) between the box core B14 (the undisturbed, and well-preserved laminae sequences), B6 and the gravity core G10 all retrieved in Pisco continental shelf. The SCOPIX images the colors were inverted, thus the darker (lighter) laminae represent dense (less dense) sediments. The numbers at the right side of the imagens represent the uncalibrated 14C ages. Yellow line indicate the position of the sedimentological/biogeochemical shift (Gutiérrez et al., 2009). The upper black bold line indicates the start of $^{241}$Am activity. The Black bars at the left side of the cores indicate homogeneous deposits, while green bars at the right side indicate the extent of the diatom layers. The stratigraphic markers are represented by the continuous colored thin lines that indicate possible (less obvious) correlations, methodology details in Salvatteci et al., (2014).

**Downcore profile of excess $^{210}Pb$ and $^{241}Am$ in the Pisco boxcore B040506**

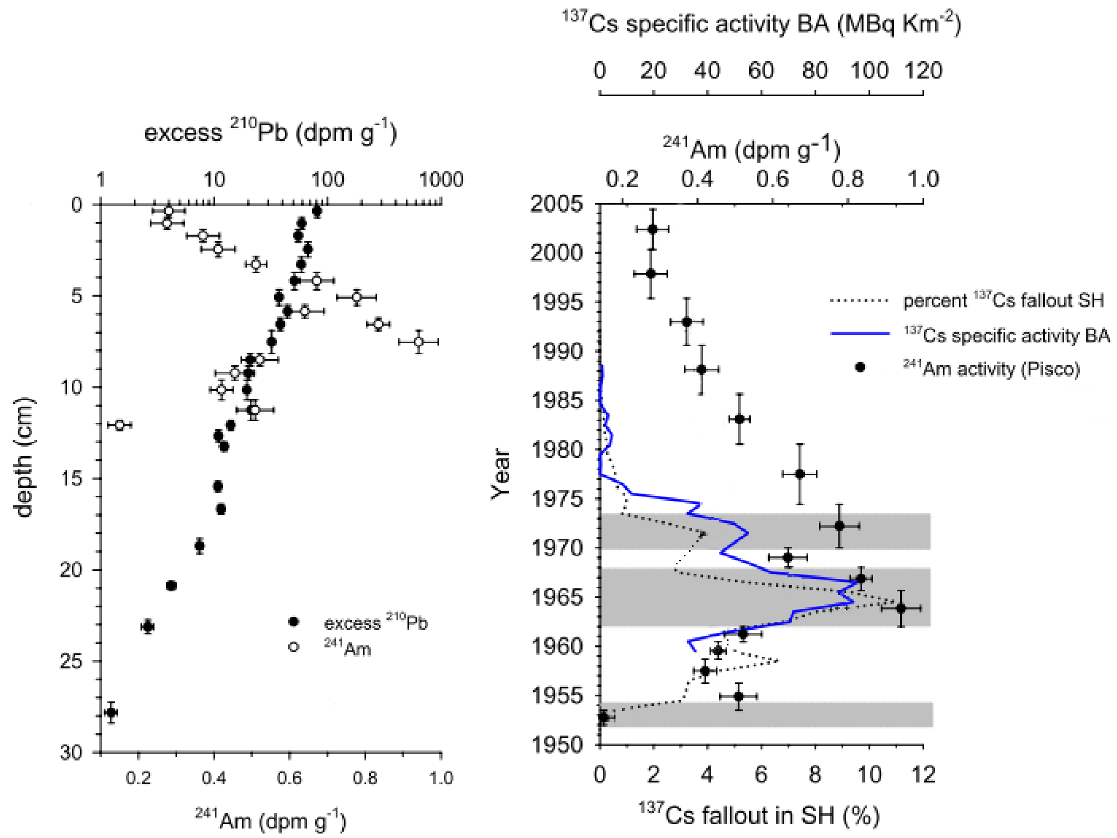


Figure S2: Downcore profile of excess $^{210}Pb$ and $^{241}Am$ in the Pisco boxcore B040506. Reconstructed fallout of $^{137}Cs$ in the Southern Hemisphere (UNSCEAR, 2000), and fallout specific activity of $^{137}Cs$ in Buenos Aires (Ribeiro & Arribére, 2002). The prominent features of fallout change (onset and peak periods, shaded) were used to identify three time-markers in the downcore $^{241}Am$ specific activity for both cores. Time intervals for each time-marker were estimated from excess $^{210}Pb$ – derived sedimentation rate in the uppermost layer and sample layer thickness (taken and modified from Gutiérrez et al., (2009)).

**Record of the entire grain size distribution.**

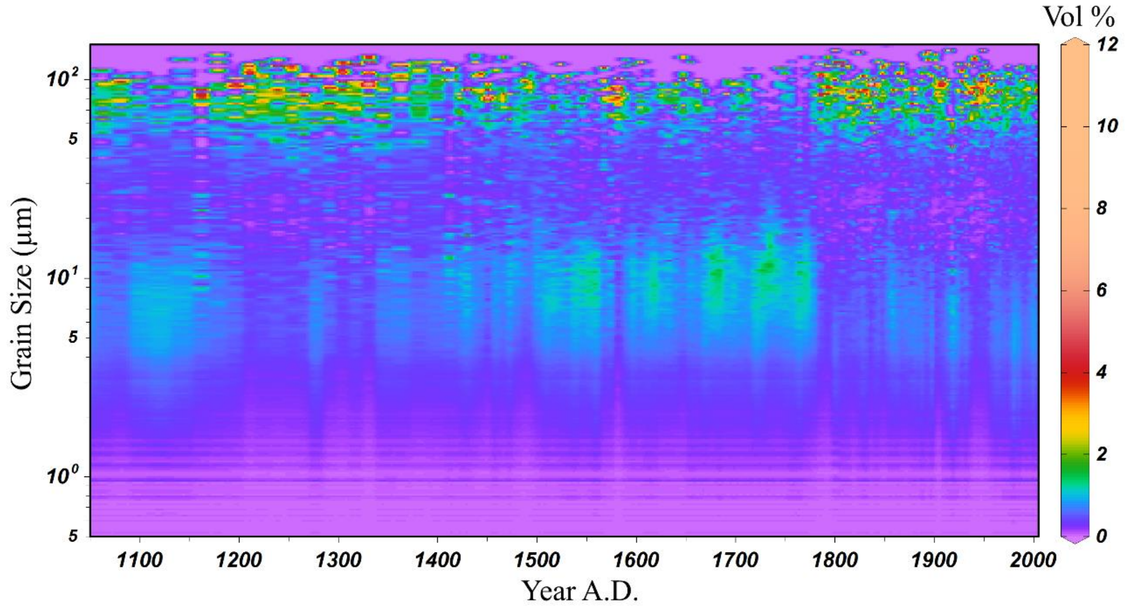


Figure S3: Interpolation of the grain-size data distribution corresponding to the entire record (overlapping of the B040506 and G10-GC-01 sediment core). Two modes of grain sizes are apparent. A first one with finest grains range from ~3 to 15 µm; and the second one with coarser grains varied between of ~50-120 µm.

**Principal component analysis of grain size classification.**

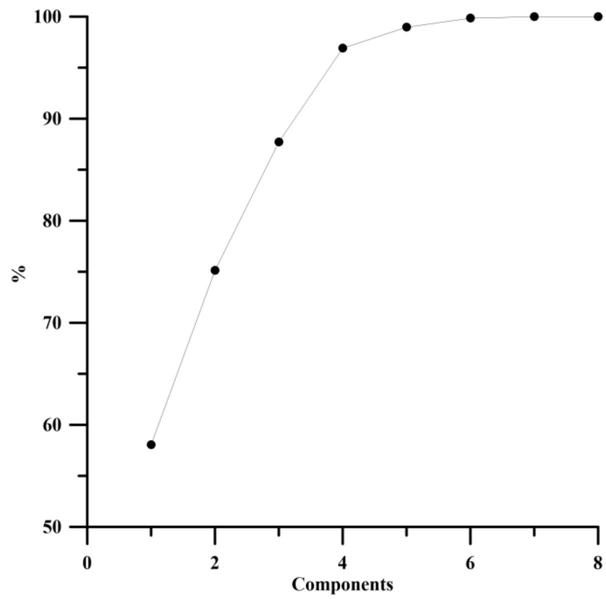


Figure S4: Variability proportion (coefficient of determination) obtained by principal components analysis (PCA) based on grain-size classification of Wentworth (1922). Four components can explain 97% of the total variability of the samples.

**Supplement Bibliography**

Gutiérrez, D., Sifeddine, A., Field, D., Ortlieb, L., Vargas, G., Chaves, F., Velazco, F., Ferreira, V., Tapia, P., Salvatteci, R., Boucher, H., Morales, M. C., Valdes, J., Reyss, J., Campusano, A., Boussafir, M., Mandeng-Yogo, M., Garcia, M. and Baumgartner, T.: Rapid reorganization in ocean biogeochemistry off Peru towards the end of the Little Ice Age, Biogeociences, 6, 835–848, 2009.

Salvatteci, R., Field, D., Sifeddine, A., Ortlieb, L., Ferreira, V., Baumgartner, T., Caquineau, S., Velazco, F., Reyss, J. L., Sanchez-Cabeza, J. A. and Gutierrez, D.: Cross-stratigraphies from a seismically active mud lens off Peru indicate horizontal extensions of laminae, missing sequences, and a need for multiple cores for high resolution records, Mar. Geol., 357, 72–89, doi:10.1016/j.margeo.2014.07.008, 2014.

Sifeddine, A., Gutiérrez, D., Ortlieb, L., Boucher, H., Velazco, F., Field, D., Vargas, G., Boussafir, M., Salvatteci, R., Ferreira, V., García, M., Valdés, J., Caquineau, S., Mandeng Yogo, M., Cetin, F., Solis, J., Soler, P. and Baumgartner, T.: Laminated sediments from the central Peruvian continental slope: A 500 year record of upwelling system productivity, terrestrial runoff and redox conditions, Prog. Oceanogr., 79(2-4), 190–197, doi:10.1016/j.pocean.2008.10.024, 2008.

Wentworth, C. K.: A Scale of Grade and Class Terms for Clastic Sediments, J. Geol., 30(5), 377–392, doi:10.1086/622910, 1922.