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Supplement of

Recording of climate and diagenesis through fossil pigments and sedimentary DNA at Laguna Potrok Aike, Argentina

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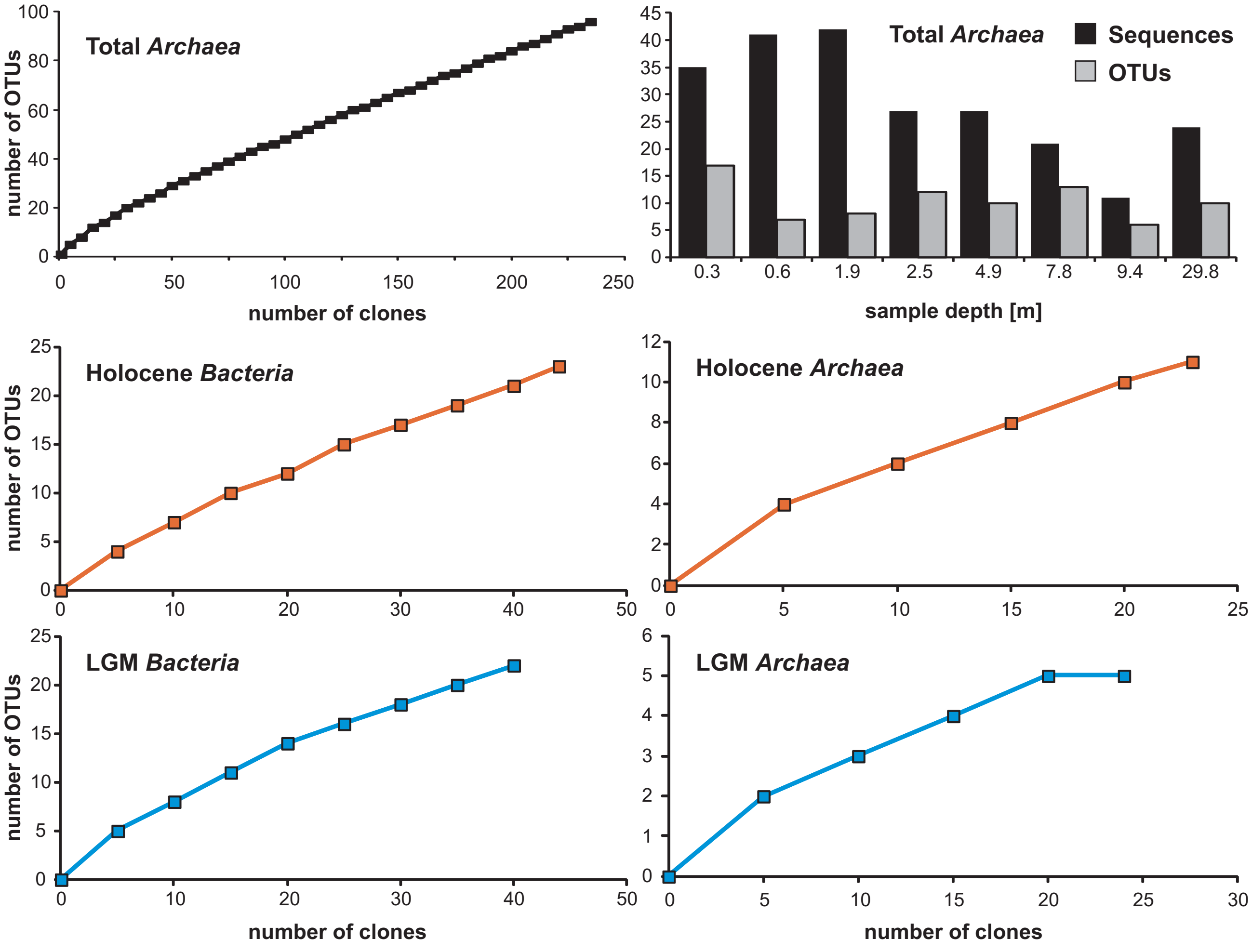
Supplementary material

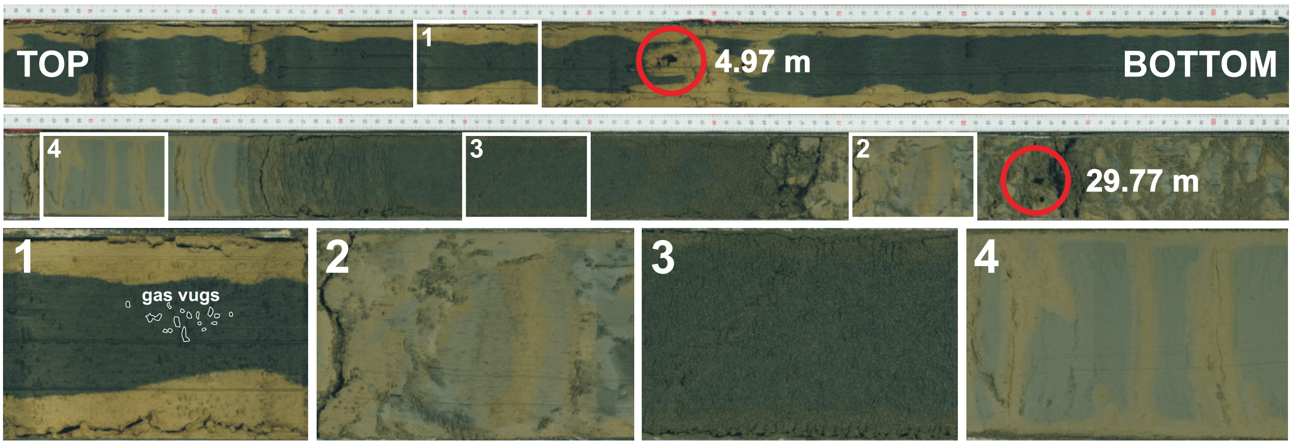
1) Diversity indices (page 1)
2) Rarefaction curves (page 1)
3) Sedimentary features in Holocene and LGM horizons (page 2)
4) Geochemistry of pore water and lake surface waters (page 2)
5) Core sections and possible drilling artifacts (page 3)
6) Comparison between on-site and late ATP measurements (page 3)

Bacteria	**Sequence number**	**Cut-off**	**OTUs**	**Chao**	**Shannon**	**Dominant species**
Total	84	3 %	44	126.67	3.40	*Atribacteria*
Holocene	44	3 %	23	108.50	2.64	*Atribacteria*
Glacial	40	3 %	22	33.14	2.86	δ *Proteobacteria*
Archaea						
Total	235	3 %	96	886.00	3.71	Marine Group 1
Holocene	23	3 %	11	21.50	2.10	*Methanomicrobiales*
Glacial	24	3 %	5	8.00	1.10	SAGMEG

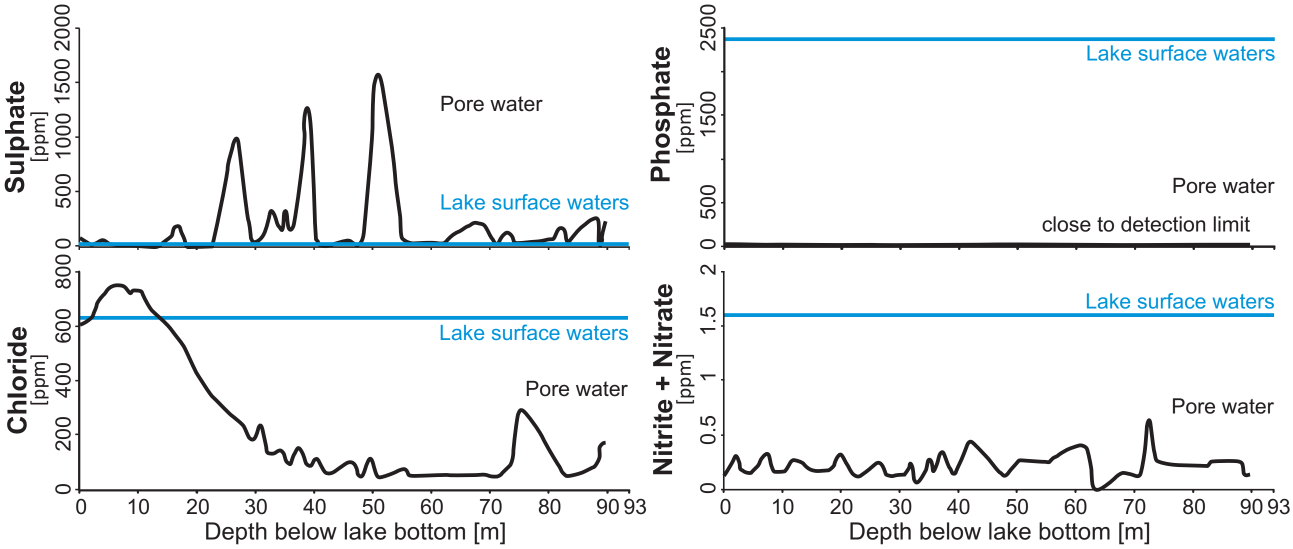
1) Table displaying phylogenetic indices: OTUs were calculated for a 97 % sequence identity cut-off value.



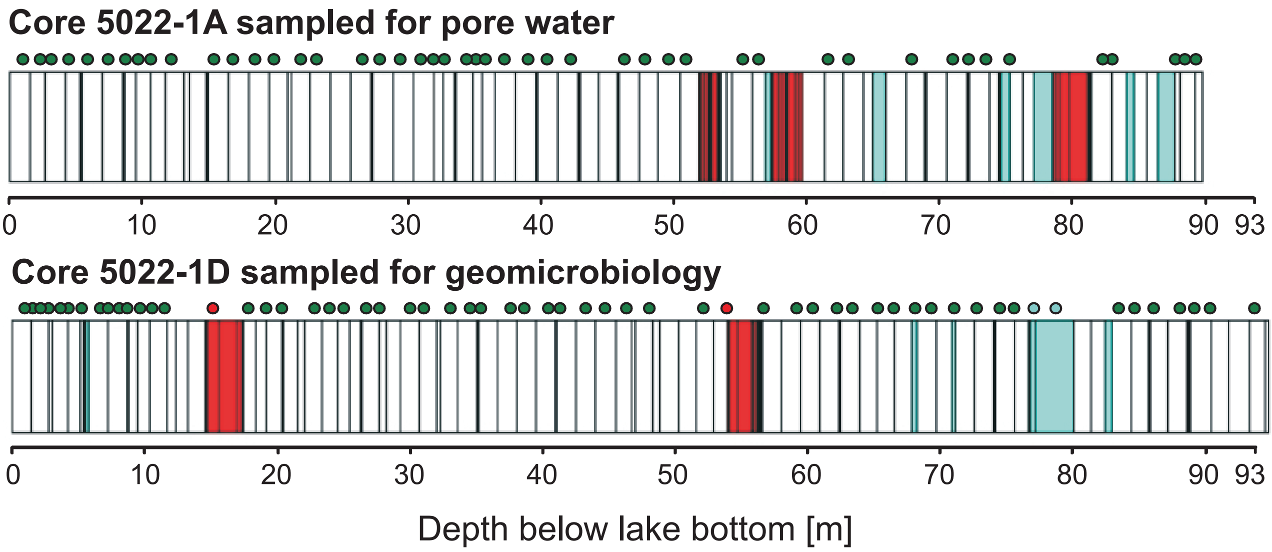
2) Rarefaction curves: OTUs were calculated for a 97 % sequence identity cut-off value.



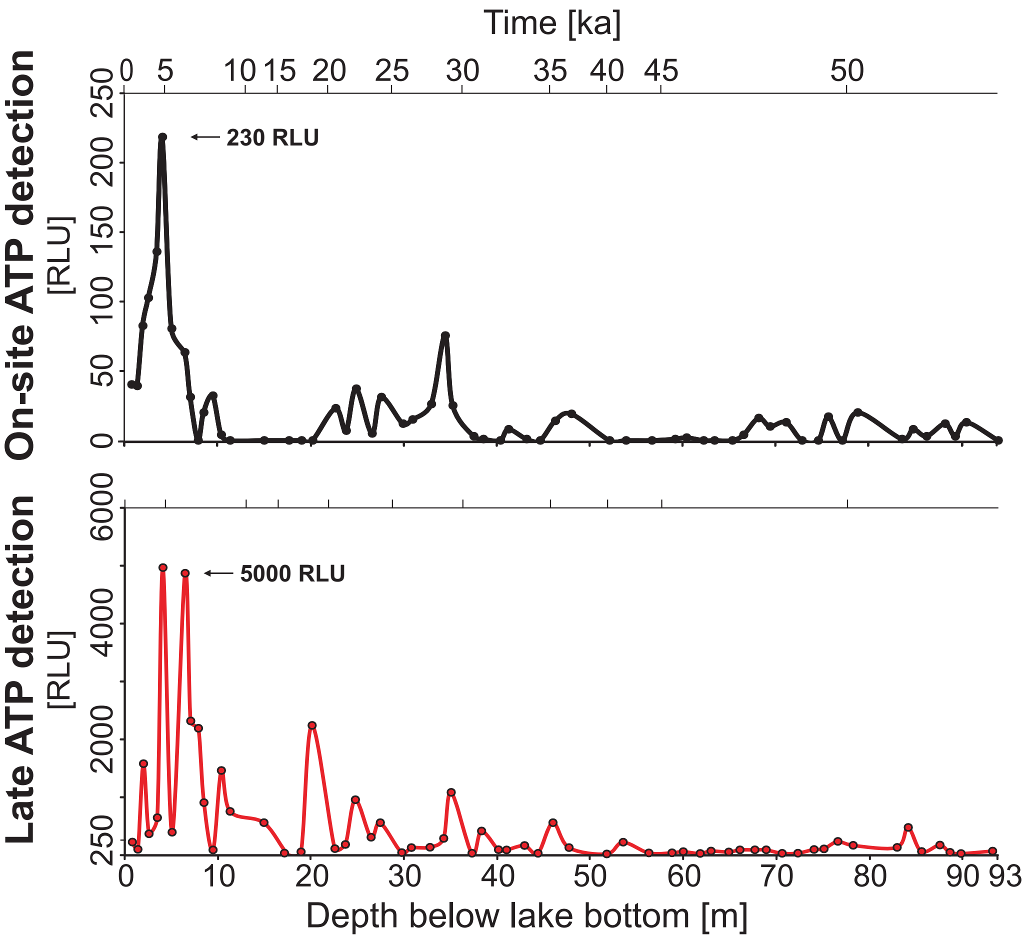
3) Comparison between Holocene and LGM sedimentary features in sections sampled for clone libraries: The Holocene sequence can be characterized as pelagic to hemipelagic, black and soft, anoxic gas-saturated sediments (**1**). Oxidized rims occurred during storage after the aperture of sampling windows. The LGM sequence first reflects a pelagic to hemipelagic regime with structures of fluid escapes (**2**). Then, fine mafic sands (**3**) could be associated with a gravity event that triggered gas escapes due to sudden loading on the underlying sediment (Vuillemin et al., 2013a). The top of the section shows a return to pelagic sedimentation (**4**). In general, the last glacial record displays multiple intercalations of volcanic detritus.



4) Geochemical comparison between pore water and lake surface waters: The present comparison provides evidence for the absence of sediment contamination by the hydraulic system during drilling operations. Results from pore water analysis can thus be used as indicators of paleoconditions (i.e. chloride) and geochemical changes within sediments (i.e. sulphate, phosphate) (Vuillemin et al., 2014b).



5) Core sections: Possible drilling artifacts (Ohlendorf et al., 2011) were put in parallel to sample locations in order to validate the genuine use and interpretation of their results in the absence of any established composite depth at site 1 (Gebhardt et al., 2012). Drilling artifacts were mostly related to coarse layers and gravity events (Kliem et al., 2013).



6) Comparison between on-site and late ATP measurements: A second round of ATP assays measured with a hand-held device showed that microbial colonization of sediments that were initially inactive did not occur during long-term storage. This fact emphasizes the habitability of specific horizons, such as those corresponding to the Holocene and LGM times. It also argues against the possible reworking of modern active microbes into underlying sediments during drilling operations.