



## **THICKNESS VARIATION OF SEDIMENT LAMINATION IN PUYEHUE LAKE (LAKE DISTRICT, SOUTHERN CHILE) DURING THE LAST MILLENNIUM: A REGIONAL SOUTHERN HEMISPHERE RECORD OF EL NIÑO ?**

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Lake District (Southern Chile) is investigated as a new regional record of past climate changes in Southern Hemisphere, in particular in order to evidence any regional impact of ENSO in South-America. We analyzed three short cores (60 cm) from the key-site of Puyehue Lake (40°S) which has been selected for multiproxy analyses (Bertrand et al., this session). Sedimentation model is related by a laminated mud increment mainly controlled by the biogenic activity and by the annual thermal lake cycles (turn-over of the nutrients during autumn and winter-time). We analysed lamination occurrence and thickness from enlarged images of thin-sections preparation (magnitude 5x) in order to increase sediment resolution. The age-model of the cores is based on counting laminations, assuming that sedimentation is varved. Indeed, this varve sedimentation model is in accordance with chronology based on the decrease of  $^{210}\text{Pb}$  rates and peaks of  $^{137}\text{Cs}$ . Variation of the lamination thickness shows four different phases of sedimentation. (1) Since c.a. 1350 A.D. (base of the cores) to 1460 A.D., varve-thickness ranges around 400  $\mu\text{m}$  and sedimentation rates are 0,5 mm/yr. (2) From 1460 A.D. to 1890 A.D., varve-thickness is about 600  $\mu\text{m}$  with a minimum at 1730 A.D., and sedimentation rates increases from 0,7 to 1,2 mm/yr. (3) From 1890 A.D. to c.a 1930 A.D., varve-thickness increases up to 2000  $\mu\text{m}$ , and sedimentation rates vary between 1,2 to 2,3 mm/yr. (4) From c.a. 1930 A.D. to Actual, varves are about 500  $\mu\text{m}$  with a destratified layer coincident with the 1960 seismic event of Val-

divia; sedimentation rates are between 0,6 to 1,2 mm/yr. The four phases are discussed according to variations of the lake palaeoproductivity by respect with river run-off detrital supplies; the influence of the westerlies on the variations of the lamination thickness is discussed in term of possible regional impact of ENSO.