

## **Paleo-limnological conditions in the Dead Sea Basin from porewater in the ICDP deep core**

Levy E. J. (1,2), Sivan O. (1), Yechieli Y. (2), Gavrieli I. (2), Stein M. (2), Lazar B. (3)

1. Dept. of Geology and Environmental Sciences, Ben Gurion University of the Negev, Beer-Sheva 84105

2. Geological Survey of Israel, 30 Malkhe Israel St., Jerusalem 95501

3. Institute of Earth Sciences, The Hebrew University of Jerusalem 91904

The major ions composition of porewater extracted from core catchers collected along the ~450 m of the ICDP Dead Sea Deep core represent the chemical composition of the hypolimnion (lower water mass) of the terminal-hypersaline lakes that occupied the basin during the last 220 ka, i.e. the Dead Sea, Lisan, Samra and Amora. The salinity depth profile reflects the secular variations in the water balance of these terminal lakes, whereas the depth profiles of some individual ions may be assigned to minerals that precipitated or dissolved (e.g., aragonite, gypsum and halite) from these water bodies due to evaporation/dilution and/or common ion effects.

The profile of Na/Cl ratio reveals three alternations between periods of halite precipitation, as identified by the drop in Na/Cl values to minimum of 0.19, and halite dissolution, during which Na/Cl values rose to over 0.60. These changes are best explained by net evaporation and lake level drops, and net water input with possible lake level rise, respectively. The depth profile of the most conservative major ions, Br<sup>-</sup> and K<sup>+</sup>, reveal a ~50% drop in concentration during the Lisan period (between 190-90 m in the core, representing time interval of ~70-14 Ky BP). We attribute this “freshening” to extensive input of runoff water and a general rise in lake level, which is also associated with increasing Na/Cl ratio. The overall salinity of the lake at this period dropped to just ~70% compared to the pre-Lisan period or present day salinity, as indicated by the Na<sup>+</sup> and Cl<sup>-</sup> depth profiles. The difference between these two ion pairs suggests that continuous dissolution of halite during that period “buffered” the lake’s salinity and it did not drop to the dilution levels of Br<sup>-</sup> and K<sup>+</sup>. An attempt to reconstruct the paleo-limnology of the lake sequences based on mass balance calculations on the different major ions will be presented at the conference.