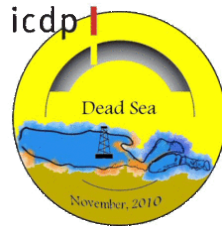


# Dead Sea Deep Drilling Project

Israel/ Jordan



## Goal & Scientific Objective

The main purpose of the project was to recover a long, continuous core to provide a high resolution record of the paleoclimate, paleoenvironment, paleoseismicity, and paleomagnetism of the Dead Sea Basin. In detail: (i) establish the behavior of abrupt hydrological-limnological events (e.g. catastrophic drying or rising of the lakes) by reconstructing the environmental, climatic and tectonic history of the region with high-resolution chronologies, complemented by varve counting, (ii) compare the limnological-hydrological history of the Dead Sea water-bodies with regional and global climatic records, and (iii) investigate the relation between human culture development and climatic changes in the region.

## Operational Achievements

Drilling operations were performed by DOSECC using the Deep Lake Drilling System (DLDS). Three sites were multiple cored and ~720 m of sediment cores have been retrieved in total.

Site-1: Eight holes (two abandoned) were drilled at water depth of 300 m. The longest drill hole reached a depth of 459 m beneath lake floor (b.l.f.).

Site-2: one core was drilled at water depth of 11.5 m.

Site-3: three cores were drilled at water depth of 2.4 m. One hole reached a depth of 350 m (b.l.f.).

The ICDP Operational Support Group performed logging measurements on Site 1 in the boreholes 1A, 1B and on Site 3 in borehole 3C. Logging was done in temporarily cased and open borehole.

## Web & Media Resources

<http://deadsea.icdp-online.org/>

[www.youtube.com/watch?v=ZNeIVy-n26M](http://www.youtube.com/watch?v=ZNeIVy-n26M)

## Timeline

2006 ICDP proposal submission

2010 (November) – 2011 (March) drilling operations

## Principal Investigators

Mordechai Stein, Geological Survey of Israel

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## Data & Sample Access

The cores are stored at the MARUM – IODP Bremen Core Repository.

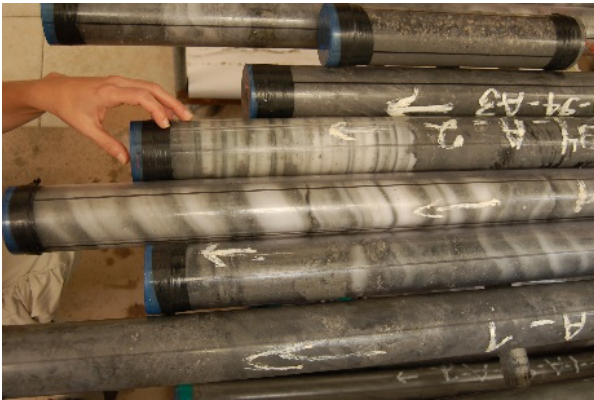
Logging data are available on ICDP website on request.



## Scientific Findings

The sedimentary record represents several glacial and interglacial cycles spanning an estimated interval of ~200,000 years. It can be divided into two dominant lithologies: salt layers interbedded with laminated mud, and massive and laminated marl interbedded with thin salt layers.

Two pronounced dry periods were detected at ~3500–3300 and ~3000–2400 cal. yr BP which are differently expressed in the sediment records. The results suggest that during the younger dry period, the Dead Sea region experienced an overall dry climate, superimposed by an increased occurrence of flash floods caused by a change in synoptic weather patterns



*Pebbly layer at ~ 235m overlying a 45 m salt sequence possibly mark a significant lake retreat*

## Key Publications

Stein, M.; Ben-Avraham, Z.; Goldstein, S.; Agnon, A.; Ariztegui, D.; Brauer, A.; Haug, G.; Ito, E.; Yasuda, Y. (2011): Deep Drilling at the Dead Sea. *Scientific Drilling* 11 46-47.

doi:10.2204/iodp.sd.11.04.2011

Stein, M.; Ben-Avraham, Z.; Goldstein, S.L. (2011): Dead Sea Deep Cores: A Window Into Past Climate and Seismicity. *Eos, Transactions, American Geophysical Union* 92(49) 453

Neugebauer, I.; Brauer, A.; Schwab, M.J.; Waldmann, N.D.; Enzeld, Y.; Kitagawae, H.; Torfstein, A.; Frank, U.; Dulski, P.; Agnon, A.; Ariztegui, D.; Ben-Avraham, Z.; Goldstein, S.L.; Stein, M.; the DSDDP Scientific Party (2014): Lithology of the long sediment record recovered by the ICDP Dead Sea Deep Drilling Project (DSDDP). *Quaternary Science Reviews* 102 149-165. doi:10.1016/j.quascirev.2014.08.013

Neugebauer, I.; Brauer, A.; Schwab, M.J.; Dulski, P.; Frank, U.; Hadzhiivanova, E.; Kitagawa, H.; Litt, T.; Schiebel, V.; Taha, N.; Waldmann, N.D.; DSDDP Scientific Party (2015): Evidences for centennial dry periods at ~3300 and ~2800 cal. yr BP from micro-facies analyses of the Dead Sea sediments. *The Holocene* 25(8) 1358-1371. doi:10.1177/0959683615584208

Thomas, C.; Ebert, Y.; Kiro, Y.; Stein, M.; Ariztegui, D.; the DSDDP Scientific Team (2016): Microbial sedimentary imprint on the deep Dead Sea sediment. *The Depositional Record* 2(1) 118–138. doi:10.1002/dep2.16