

Yigal Erel

Affiliation: The Fredy & Nadine Herrmann Institute of Earth Sciences,
The Hebrew University of Jerusalem

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EDUCATION

B.Sc., Geology 1980 to 1983
The Hebrew University, Israel

M.Sc., Geology 1983 to 1985
The Hebrew University, Israel

Advisors: Drs. Alan Matthews and Yacov Nathan

Ph.D., Geochemistry and Environmental Engineering Science 1985 to 1991
California Institute of Technology, California, USA

Advisors: Drs. Clair C. Patterson and James J. Morgan

Post-doctoral Research Fellow, Environmental Engineering Science 1991 to 1992
California Institute of Technology, California, USA

Advisor: Dr. Michael R. Hoffmann

APPOINTMENTS

Visiting Assistant Professor, Department of Earth Sciences 1992 to 1993
Dartmouth College

Visiting Associate, Department of Environmental Engineering Science 1992 to 1995
California Institute of Technology

Adjunct Assistant Professor, Department of Earth Sciences, 1993 to 1997
Dartmouth College

Adjunct Associate Professor, Department of Earth Sciences 1998 to 2000
Dartmouth College

Visiting Associate, Department of Geological Sciences 2004 to 2006
University of Michigan

Senior Lecturer, Institute of Earth Sciences 1993 to 1998
Faculty of Sciences

Associate Professor, Institute of Earth Sciences 1998 to 2004
Faculty of Sciences

Professor, Institute of Earth Sciences 2004 to present
Faculty of Sciences

Administrative appointments (Hebrew U and others)

Dean, Faculty of Science 2012 to 2016

Faculty of Sciences Executive Committee 2007 to 2016

The Hebrew University Senate 2007 to 2016

Head, the Institute of Earth Sciences, Faculty of Sciences 2007 to 2012

Director, the Multi-Disciplinary Center For Environmental Research	2000 to 2003
Chairman, Program of Environmental Studies, Faculty of Sciences	2000 to 2003

AWARDS AND HONORS

Graduate student fellowship Caltech 1985 - 1990
 Geological Society of America student award – 1989
 Citation for Excellence in Teaching at the Hebrew University of Jerusalem – 2006, 2013
 The Hebrew University Rector Prize - 2007

SELECTED PROFESSIONAL ACTIVITY

IUED (Adam Teva VaDin), Board of Directors	2008 to 2012
IUI (Institute for Marine Sciences – Eilat), Board of Directors	2009 to 2012
Bloomfield Science Museum Jerusalem, Board of Directors	2010 to 2016
The Jerusalem Museum of Natural History, Chairperson academic comm.	2011 to 2012

TEACHING- general field and/or courses names if wishes

Introduction to Earth Science, Introduction to Environmental Science, Introduction to Soil Science. Supervision and co-supervision of 19 MSc and 11 PhD students.

LIST OF PUBLICATION**BOOKS/EDITED VOLUMES:**

Censi P., Darrah T. H., **Erel Y.** eds. (2013) *Medical Geochemistry - Geological Materials and Health*. Springer - Dordrecht, Heidelberg, New York, London. DOI 10.1007/978-94-007-4372-4

CHAPTERS IN BOOKS:

Blum J. D. and **Erel Y.** (2003) Radiogenic isotopes in weathering and hydrology. In *Surface and Ground Water, Weathering, Erosion and Soils*, (ed. J. I. Drever). Elsevier Science. Vol. 5 in *Treatise on Geochemistry*, Editors K. K. Turekian and H. D. Holland.

Erel Y., Tirosh O., Kessler O., Dayan U., Belkin S., Stein M., Sandler A., and Schauer J. J. (2013) Atmospheric particulate matter (PM) in the Middle East: Toxicity, trans-boundary transport, and influence of synoptic conditions. In *Medical Geochemistry - Geological Materials and Health*. Editors: P. Censi, T. H. Darrah, and Y. Erel. Springer.

Erel, Y. S. L. Goldstein, A. Torfstein, D. Palchan, M. Ben Israel¹, and M. Stein (2015) Isotopic tracers of dust and loess in the Levant. *Quaternary of the Levant*. Editors: Y. Enzel and O. Bar Yosef. *Cambridge University Press*. In press.

JOURNAL ARTICLES:

Erel Y., Matthews A., and Nathan Y. (1988) Potential use of fly ash in the cement industry in Israel. *Cement and Concrete Research*, 18, 503-512.

Betterton E. A., **Erel Y.**, and Hoffmann M. R. (1988) Aldehyde-Bisulfite adducts: Prediction of some of their thermodynamic and kinetic properties. *Environ. Sci. Technol.*, 22, 92-99.

Erel Y. and Katz A. (1990) Trace element profiles in calcite veins: A potential diagenetic tool. *Chemical Geol.*, 85, 361-367.

Erel Y., Patterson C. C., Scott M. J., and Morgan J. J. (1990) Transport of industrial lead in snow through soil to stream water and groundwater. *Chemical Geol.*, 85, 383-392.

Church T. M., Veron A., Patterson C. C., Settle D., **Erel Y.**, Maring H. R., Merrill J. T., and Flegal A. R. (1990) Trace elements in the North Atlantic troposphere: shipboard results of precipitation and aerosols. *Global Biogeochemical Cycles*, 4, 431-443.

- Erel Y.**, Morgan J. J., and Patterson C. C. (1991) Transport of natural lead and cadmium in a remote mountain stream. *Geochim. Cosmochim. Acta*, 55, 707-721.
- Erel Y.** and Morgan J. J. (1991) The effect of surface reactions on the relative abundances of trace metals in deep-ocean water: *Geochim. Cosmochim. Acta*, 55, 1807-1813.
- Manea-Krichten M., Patterson C. C., Miller G., Settle D., and **Erel Y.** (1991) Comparative increased of lead and barium with age in human tooth enamel, rib and ulna. *Sci. Tot. Environ.*, 107, 179-202.
- Veron A., Church T. M., Patterson C. C., **Erel Y.**, and Merrill J. T. (1992) Continental origin and industrial sources of trace metals in the Northwest Atlantic troposphere. *J. Atmos. Chem.*, 14, 339-351.
- Shemesh A., Ron H., **Erel Y.**, Kolodny Y., and Nur A. (1992) Isotopic composition of vein calcite and its fluid inclusions: Implications to paleohydrology systems, tectonic events and vein formation processes. *Chemical Geol.*, 94, 307-314.
- Pehkonen S., **Erel Y.**, and Hoffmann M. R. (1992) Simultaneous spectrophotometric measurement of Fe(II) and Fe(III) in cloud and fogwater. *Environ. Sci. Technol.* 26, 1731-1736.
- Erel Y.** and Morgan J.J. (1992) The relationships between rock-derived lead and iron in natural fresh water systems. *Geochim. Cosmochim. Acta*, 56, 4157-4167.
- Erel Y.** and Stolper E. M. (1993) Modeling of rare-earth element partitioning between particles and solution in aquatic environments. *Geochim. Cosmochim. Acta*. 57, 513-518.
- Veron A., Church T. M., Flegal A. R., Patterson C. C., and **Erel Y.** (1993) Response of lead cycling to changes of the tropospheric input into the Sargasso Sea. *J. Geophys. Res.* 98 (C10), 18269-18276.
- Pehkonen S. O., Siefert R., **Erel Y.**, Webb S., and Hoffmann M. R. (1993) Photoreduction of iron oxyhydroxides in the presence of important atmospheric organic compounds. *Environ. Sci. Technol.* 27, 2056-2062.
- Erel Y.**, Pehkonen S. O., and Hoffmann M. R. (1993) Redox chemistry of iron in coastal stratus clouds. *J. Geophys. Res.* 98 (D10), 18,423-18,434.
- Blum J. D., **Erel Y.**, and Brown K. (1994) $^{87}\text{Sr}/^{86}\text{Sr}$ ratios of Sierra Nevada stream waters: implications for relative mineral weathering rates. *Geochim. Cosmochim. Acta* 58, 5019-5025.
- Erel Y.** and Patterson C. C. (1994) Leakage of industrial lead into the hydrocycle. *Geochim. Cosmochim. Acta*. 58, 3289-3296.
- Siefert R., Pehkonen S., **Erel Y.**, and Hoffmann M. R. (1994) Photoproduction of H_2O_2 in aqueous suspensions of ambient aerosol with oxalate. *Geochim. Cosmochim. Acta*. 58, 3271-3280.
- Erel Y.**, Harlavan Y., and Blum J. D. (1994) Lead isotope systematics of granitoid weathering. *Geochim. Cosmochim. Acta*. 58, 5299-5306.
- Erel Y.** and Stolper E. M. (1994) Reply to the Comment by M. Bau on "Modeling of rare-earth element partitioning between particles and solution in aquatic environments." *Geochim. Cosmochim. Acta*. 58, 4525-4526.
- Pehkonen S. O., **Erel Y.**, Siefert R., Klewicki K, Hoffmann M. R., and Morgan J. J. (1995) The dynamic chemistry of transition metals in the troposphere. *Israel J. Earth Sci.* 43, 279-296.
- Blum J. D. and **Erel Y.** (1995) A silicate weathering mechanism linking increases in marine $^{87}\text{Sr}/^{86}\text{Sr}$ with global glaciations. *Nature*, 373, 415-418.
- Halicz L., **Erel Y.**, and Veron A. (1996) Lead isotope ratio measurements by ICP-MS: accuracy, precision, and long-term drift. *Atomic Spectroscopy*, 175, 186-189.

- Erel Y.**, Harlavan Y., Stein M., and Blum J. D. (1997) U-Pb Dating of Fe-rich Phases Using a Sequential Leaching Method. *Geochim. Cosmochim. Acta* 61, 1697-1703.
- Blum J. D. and **Erel Y.** (1997) Rb-Sr isotope systematics of a granitic soil chronosequence: The importance of biotite weathering. *Geochim. Cosmochim. Acta*, 61, 3193-3204.
- Erel Y.**, Veron A., and Halicz L. (1997) Tracing the transport of anthropogenic Pb in the atmosphere and in soils using isotopic ratios, *Geochim. Cosmochim. Acta*, 61, 4495-4506.
- Harlavan Y., **Erel Y.**, and Blum J. D. (1998) Systematic Changes in lead isotopic composition with soil age in glacial granitic terrains, *Geochim. Cosmochim. Acta*, 62, 33-46.
- Sivan O., **Erel Y.**, Mandler D., and Nishri A. (1998) The dynamic redox chemistry of Fe in the oxidized, photic zone of the Sea of Galilee, *Geochim. Cosmochim. Acta*, 62, 565-576.
- Erel Y.** (1998) Mechanisms and velocities of anthropogenic Pb migration in Mediterranean soils. *Environ. Res.*, 78A, 112-117.
- Burkins D., Blum J. D., Brown K., Reynolds R. C., and **Erel Y.** (1999) Chemistry and mineralogy of a granitic, glacial soil chronosequence, Sierra Nevada Mountains, California. *Chemical Geol.*, 162, 1-14
- Teutsch N., **Erel Y.**, Halicz L., and Chadwick O. A. (1999) The influence of rainfall on metal concentration and behavior in the soil, *Geochim. Cosmochim. Acta*, 63, 3499-3512.
- Erel Y.**, Dubowski Y., Halicz L., Erez J., and Kaufman A. (2001) Lead concentrations and isotopic ratios in the sediments of the Sea of Galilee. *Environ. Sci. & Technol.* 35, 292-299.
- Teutsch N., **Erel Y.**, Halicz L., and Banin A. (2001) The distribution of natural and anthropogenic lead in Mediterranean soils. *Geochim. Cosmochim. Acta*, 65, 2853-2864.
- Harlavan Y. and **Erel Y.** (2002) The Release of Pb and REE from granitoids by the dissolution of accessory phases. *Geochim. Cosmochim. Acta*, 66, 837-848.
- Shaked Y., **Erel Y.**, and Sukenik A. (2002) Phytoplankton mediated redox cycle of iron in the epilimnion of Lake Kinneret. *Environ. Sci. & Technol.* 36, 460-467.
- Emmanuel S. and **Erel Y.** (2002) Implications from concentrations and isotopic data for Pb partitioning processes in soils. *Geochim. Cosmochim. Acta*, 66, 2517-2527.
- Erel Y.**, Axelrod T.(S), Veron A.(C), Mahrer Y.(C), Katsafados P.(T), and Dayan D. (C) (2002) Trans-boundary atmospheric lead pollution. *Environ. Sci. & Technol.* 36, 3230-3233.
- Paces T., Corcimarú S., Emmanuel S., **Erel Y.**, Novak M., Plyusnin A., Veron A., and Wickham S. (2002) Critical loads of hazardous trace elements in soil – water system. *J. Field Science*, 1, 15-22.
- Novak M., Emmanuel S., Vile, M. A., **Erel Y.**, Veron A., Paces T., Wieder R. K., Vanecek M., Stepanova M., Brizova E., and Ryklova J. (2003) The provenance of lead in eight Central European peat bogs determined from isotope ratios, strengths and operation times of regional pollution sources. *Environ. Sci. Technol.* 37, 437-445.
- Feldstein T., Kashman Y., Abelson A., Fishelson L., Mokady O., Bresler V., and **Erel Y.** (2003) Using marine molluscs for environmental monitoring. III. Chemical characterization of animal tissue and sediments. *Helgoland Marine Research*, 57, 212-219.
- Shaked Y., **Erel Y.**, and Sukenik A. (2004) The biogeochemical cycle of Fe and associated elements in Lake Kinneret. *Geochim. Cosmochim. Acta*, 68, 1439-1451. Ten most downloaded papers - 2005.
- Matthews A., Morgans-Bell H., Emmanuel S., Jenkyns H., Halicz L., and **Erel Y.** (2004) Controls of iron isotope fractionation in organic-rich sediments. *Geochim. Cosmochim. Acta*; 68, 3107-3123.
- Shaked Y., Kutska A., Morel F. M. M. and **Erel Y.** (2004) Simultaneous determination of iron reduction and uptake by phytoplankton. *Limnol. Ocean., Meth.*; 2, 137-145.

- Erel Y.**, Blum J. D., Roueff E., and Ganor J. (2004) Lead and strontium isotopes as monitors of experimental granitoid mineral dissolution. *Geochim. Cosmochim. Acta*, 68, 4649-4663.
- Ganor J., Roueff E., **Erel Y.**, Blum J. D. (2005) The dissolution kinetics of a granite and its minerals – implications for comparison between laboratory and field dissolution rates. *Geochim. Cosmochim. Acta*, 69, 607-621.
- Emmanuel S., **Erel Y.**, Matthews A., and Teutsch N. (2005) A preliminary mixing model for Fe isotopes in soils. *Chemical Geology*; 222, 23-34.
- Erel Y.**, Dayan, U., Rabi, R., Rudich, Y., and Stein, M. (2006) Trans boundary transport of pollutants by atmospheric mineral dust. *Environ. Sci. & Technol*, 40, 2996-3005.
- Erel Y.**, Listovsky N, Matthews A., Ilani S., and Avni Y. (2006) Tracing end-member fluid sources in sub-surface iron mineralization and dolomitization Along a proximal fault to the Dead Sea Transform. *Geochim. Cosmochim. Acta*, doi:10.1016/j.gca-2006.08.019.
- Erel Y.**, Kalderon-Asael, B., Dayan, U., and Sandler A. (2007) European Atmospheric Pollution Imported by Cooler Air Masses to the Eastern Mediterranean during the Summer. *Environ. Sci. & Technol*, 41, 5198-5203.
- Jenkyns, H., Matthews, A., Tsikos, H. and **Erel Y.** (2007) Nitrate reduction, sulfate reduction and sedimentary iron-isotope evolution during the Cenomanian-Turonian Oceanic Anoxic Event. *Paleoceanography* 22 doi:10.1029/2006PA001355.
- Magrisso, S., **Erel Y.**, and Belkin S. (2008) Microbial reporters of metal bioavailability. *Microbial Biotechnology*. 1, 320 – 330. doi:10.1111/j.1751-7915.2008.00022.x. Top cited papers of Microbial Biotechnology 2012.
- Novak; M., **Erel Y.**, Zemanova, L., Bottrell, S. H., Adamova, M. (2008) A comparison of lead pollution record in Sphagnum peat with known historical Pb emission rates in the British Isles and the Czech Republic. *Atmospheric Environment*. 42, 8997–9006.
- Matthews A., Emmanuel S., Levi L., Gvirtzman H., and **Erel Y.** (2008) Kinetic fractionation of Fe isotopes during transport through a porous quartz sand column. *Geochimica Cosmochim. Acta* 72, 5908–5919.
- Harlavan, Y., **Erel Y.** and Blum, J. D. (2009) The coupled release of REE and Pb to the soil labile pool with time by weathering of accessory phases, Wind River Mountains, WY. *Geochim. Cosmochim. Acta*. 73, 320–336.
- Eldan, M., Shoham, T., **Erel Y.**, and Mandler, Y. (2009) Monitoring heavy metals in seawater by electrochemically induced deposition as hydroxides. *Electroanalysis*. 21, No. 3-5, 368 – 378. DOI: 10.1002/elan.200804454.
- Ryb U, **Erel Y.**, Matthews A., Avni Y., Gordon G., Anbar A. D. (2009) Large molybdenum isotope variations trace sub-surface fluid migration along the Dead Sea Transform. *Geology*, 37; 463–466; doi: 10.1130/G25331A.1.
- Andersen M. B., **Erel Y.**, and Bourdon B. (2009) Experimental evidence for ²³⁴U-²³⁸U fractionation during granite weathering with implications for ²³⁴U/²³⁸U in natural waters. *Geochim. Cosmochim. Acta* 73, 4124-4141.
- Kalderon-Asael B., **Erel Y.**, Sandler A., and Dayan U. (2009) Mineralogical and chemical characterization of suspended atmospheric particles over the east Mediterranean based on synoptic-scale circulation patterns. *Atmospheric Environment* 43(25), 3963-3970.
- Magrisso, S., Belkin, S. and **Erel Y.** (2009) Lead bioavailability in soil and soil components. *Water Air Soil Pollut.*, 202, 315-323.
- Erel Y.** and Torrent J. (2010) Contribution of Saharan dust to Mediterranean soils assessed by sequential extraction and Pb and Sr isotopes. *Chemical Geology* 275 (2010) 19–25.

- Tsikos H., Matthews A., **Erel Y.**, Moore J. M. (2010) Iron isotopes constrain biogeochemical redox cycling of iron and manganese in a Palaeoproterozoic stratified basin. *Earth Planet. Sci. Lett.* doi:10.1016/j.epsl.2010.07.032.
- Dayan U., **Erel Y.**, Shpund J., Kordova L., Wanger A., and Schauer J. J. (2011) The Impact Of Local Sources And Meteorological Factors On Nitrogen Oxide And Particulate Matter Concentrations: A Case Study Of The Day Of Atonement In Israel. *Atmospheric Environment* 45, 3325-3332, doi: 10.1016/j.atmosenv.2011.02.017.
- Enzel, Y, Amit, R., Grodek, T, Ayalon, A., Lekach, J., Porat, N., Bierman, P., Blum, J. D., and **Erel, Y.** (2011) Late Quaternary depositional landforms in Nahal Yael, Israel: "Impact of climatic change on an arid watershed1", *Geological Society of America Bulletin*. doi: 10.1130/B30538.1
- Zipori A., Rosenfeld D., Shpund J., Steinberg D. M., and **Erel Y.** (2012) Targeting and impacts of AgI cloud seeding based on rain chemical composition and cloud top phase characterization. *Atmospheric Research* 114, 130-119.
- Kessler N, Schauer J. J., Yagur-Kroll S, Melamed S, Tirosh O, Belkin S, **Erel Y** (2012) A bacterial bio-reporter panel to assay the cytotoxicity of atmospheric particulate matter. *Atmospheric Environment* 63, 94-101.
- Palchan D., Stein M., Almogi-Labin A., **Erel Y.**, and Goldstein S. L (2013) Dust transport and synoptic conditions over the Sahara-Arabia deserts during the MIS6/5 and 2/1 transitions from physical, chemical and isotopic properties of Red Sea cores. *Earth Planet. Sci. Lett* 382,125–139.
- Ryb, U., Matmon, A., **Erel Y.**, Haviv, I., Katz, A., Starinsky, A., Angert, A., ASTER Team (2014) Controls on denudation rates in tectonically stable Mediterranean carbonate terrain. *Geol. Soc. Am. Bull.* 126, 552–568.
- Ryb, U., Matmon, A., **Erel Y.**, Haviv, I., Benedetti, L., and Hidy, A. J. (2014) Styles and rates of long-term denudation in carbonate terrains under a Mediterranean to hyper-arid climatic gradient. *Earth Planet. Sci. Lett* 406, 142–152.
- Ben Israel, M., Enzel Y., Amit R., and **Erel Y.** (2014) Provenance of the various grain-size fractions in the Negev loess and potential changes in major dust sources to the Eastern Mediterranean. *Quaternary Res.* 83, 105–115.
- Zipori, A., D. Rosenfeld, O. Tirosh, N. Teutsch, and **Y. Erel** (2015) Effects of aerosol sources and chemical compositions on cloud drop sizes and glaciation temperatures, *J. Geophys. Res. Atmos.*, 120, doi:10.1002/2015JD023270.
- Matmon, A., Hidy, A., Vaine, S., Crouvi, O., Fink, D., **Erel, Y.**, ASTER Team, Horwitz, L., Chazan, M. (2015) New chronology for the southern Kalahari Group sediments with implications for sediment-cycle dynamics and early hominin occupation. *Quaternary Res.* 84, 118–132.
- Beherec, M. A., Levy, T. M, Tirosh, O., Najjar, M., Knabb, K. A. and **Erel, Y.** (2015) Iron Age Nomads and their Relation to Copper Smelting in Faynan (Jordan): Trace Metal and Pb and Sr Isotopic Measurements from the Wadi Fidan 40 Cemetery. *J. Archaeological Sci.* 65, 70-83.
- Yahalom-Mack, N., Langgut, D., Dvir, O. Tirosh. O., Eliyahu-Behar, A., **Erel, Y.**, Langford, B., Frumkin, A., Ullman, M. and Davidovich, U. (2015) The Earliest Lead Object in the Levant. *PLOS ONE*, 10 (12): e0142948. doi:10.1371.
- Yahalom-Mack, N., Martin, M.A.S., Tirosh, O., **Erel, Y.** and Finkelstein, I. (2015) Lead Isotope Analysis of Slag-tempered Negev Highlands Pottery. Accepted to *Antiquo Oriente*.