

## Hezi Gildor

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## EDUCATION

1991-1993 *B.Sc.* in Geophysics and Atmospheric Sciences: Tel Aviv University, Israel. Magna Cum Laude.

1994-1996 *M.Sc.* in Physical Oceanography: The University of Tokyo, Japan. Thesis title: ***Modeling interannual variations of the Indonesian Throughflow using ERS-1 Satellite Wind***. Advisor: Prof. Toshio Yamagata.

1996-2001 *Ph.D.*, Weizmann Institute of Science, Israel. Thesis title: ***Dynamics of glacial-interglacial cycles: the "sea ice switch" and the role of ocean biogeochemistry***. Advisor: Prof. Eli Tziperman.

2001-2003 *NOAA Postdoctoral Fellowship in Climate and Global Change*, Lamont Doherty Earth Observatory of Columbia University. Host: Prof. Mark Cane.

## APPOINTMENTS

### Other Institutions

2003-2010 Senior Scientist, Department of Environmental Sciences and Energy Research, Weizmann Institute of Science, Rehovot, Israel.

### Hebrew University:

2010-present Associate Professor, Faculty of Mathematics and Sciences, The Institute of Earth Sciences, in the fields of oceanography and climate dynamics.

### Administrative appointments (Hebrew U and others)

2011-2015 *Head*, Oceanography board of study.

2012-present *Member*, Scientific Steering Committee of The Israel Center for Mediterranean Sea Research.

2012-present *Member*, Management Committee of the Interuniversity Institute for Marine Sciences in Eilat.

2015-present *Member*, National Committee for Research Infrastructures (and head of the sub-committee for research infrastructures in environmental sciences).

**AWARDS AND HONORS**

- 1992, 1993: Deans list, Tel-Aviv University.  
1994-1996: Fellow student of the Japanese government.  
1998: A fellowship of distinction, Weizmann Institute.  
1998, 1999: Rieger Foundation, U.S.A - Fellowship for Environmental Studies.  
2000: Student presentation honorable mention, IGS symposium on sea ice, Alaska.  
2001: The John F. Kennedy Memorial Prize for outstanding research (highest prize for PhD work at the Weizmann Institute).  
2001: Israeli Parliament Award for Excellence in Studies.  
2001: Bikura Fellowship, Israel Science Foundation.  
2001: NOAA Postdoctoral Fellowship in Climate and Global Change.  
2003: Awarded a travel grant (competitive) to participate in the first Dissertations Initiative for the Advancement of Climate Change Research, Puerto Rico.  
2003: The Sir Charles Clore Prize for the most outstanding researcher in the experimental sciences appointed as Senior Scientist in 2003-2004, Weizmann Institute.  
2006: Gledden Visiting Senior Fellowships, The University of Western Australia (declined due to personal issues).  
2007: Prize of the Scientific Council, Weizmann Institute.  
2009: JSPS (Japan Society for the Promotion of Science) Fellowship for Research in Japan (short-term).

**SELECTED PROFESSIONAL ACTIVITY**

(examples) Membership in major committees (Government, journal boards, professional associations boards),

Visiting in others research institutes and universities- title – where and when

**TEACHING- general field and/or courses names if wishes**

**Post-doctoral Fellows and Visitors**

Jack Silverman, 2005-2007. Topic: "Density currents". (Presently employed as a researcher at the Israel Oceanographic and Limnological Research).

Michael Siccha, 2011-2012. Topic: "Past and future climatic conditions over the Red Sea region from proxy records and numerical models". Lady-Davis post-doc fellow. (Presently employed as a staff scientist at the University of Bremen).

Avi Gozolchiani, 2012-2014. Topic: "The evolution of basin-wide eddies in elongated basins".

**PhD degree students**

Eli Biton, 2006-2011. (Presently employed as a researcher at the Israel Oceanographic and Limnological Research): Topic: "Submesoscale processes in the Gulf of Eilat" (started at the Weizmann Institute). Awarded twice the "Best student poster

award” in the Annual Meeting of the Israel Association of Aquatic Sciences (2007, 2009) and twice the Rieger prize (2008, 2009).

Dan Carlson, 2009-2014. Topic: “Tides, Internal Waves, and Mixing in the Northern Gulf of Eilat”. (Presently a post-doc fellow at CNR-ISMAR, La Spezia, Italy and a researcher in the Consortium for Advanced Research on Transport of Hydrocarbon in the Environment (CARTHE)). Awarded the Berko prize (2011) and twice the Rieger prize (2009, 2010).

Yael Amitai, 2010-present. Topic: “Deep water formation in the Eastern Mediterranean Sea: past, present, and future”. Co-advised with Prof. Yosef Ashkenazy (BGU). Awarded the Rieger prize (2014) and a research fellowship from the Mediterranean Sea Research Center of Israel.

Hadar Berman, 2015-present. Topic: “Plankton and nutrients dynamics in the Gulf of Aqaba: biophysical feedback vs. internal dynamics”. Awarded the Rieger prize (2015) and a travel grant from the Mediterranean Sea Research Center of Israel.

#### **MSc degree students**

Alon Shepon - graduated 2005. Topic: “The lightning-biota climate feedback”.

Eli Biton - graduated 2005. Topic: “The Red Sea during the Last Glacial Maximum”.

Rotem Aharon (co advised with Vered Rom-Kedar) - graduated 2009. Topic: “Surface mixing induced by simple 3D flows”.

Ilit Lev - graduated 2009. Topic: “The effect of sea ice on high latitudes hydrological cycle during the Last Glacial Maximum”.

Rotem Bar-Or (co-advised with Caryn Erlick) - graduated 2007. Topic: “The role of dust in glacial cycles”.

Hilla Afargan - graduated 2010. Topic: “The evolution of coherent gyre in the Gulf of Eilat”.

Rony Lahav, 2013-present. Topic: “An intercomparison of Acoustic-based Current Meters”.

Nir Haim, 2013-present. Topic: “Numeric Ocean Circulation Model Sensitivity Tests to Surface Currents Assimilation in the Eastern Mediterranean”.

#### **Undergraduate thesis (Amirim project)**

Ran Finkelstein, 2012. Topic: “The role of stochastic processes in Dannsgard-Oeschgar oscillations”.

Ruty Mendel, 2015. Topic: “Lagrangian diagnostic for mixing in a rotating frame”.  
Resulting articles: 7.53.

Simon Ben-Sushan, 2015 (co-advised with Nathan Paldor). Topic: “Rossby waves on a sphere”.

### **Summer internship**

Daniil Perets, BSc student in Mathematics from the Technical University of Munich, 2012.  
Topic: ”Analysis and Comparison of meteorological data recorded by a Buoy and on the IUI Pier in the Gulf of Eilat (Red Sea)”.

Ashley Foguel, BSc student in Geology from the University of North Carolina at Chapel Hill, 2013. Topic: “Inter-comparison between ocean current measurements by an ADCP and by a DVS”

### **Courses**

#### Undergraduate

Physical oceanography for physicists.

Topics in physical oceanography (co-thought with Prof. Yossi Ashkenazi from BGU).

Introduction to marine sciences for science major.

#### Graduate

Classical papers in Earth Sciences.

Physical oceanography.

Research methods in oceanography (co-thought with Adi Torfstein and Yeala Shaked)

Advanced topics in physical oceanography (co-thought with Dr. Yohai Kaspi from the Weizmann Institute, Prof. Vered Rom-Kedar from the Weizmann Institute, and Prof. Yossi Ashkenazi from BGU).

### LIST OF PUBLICATION or Google scholar site

#### **BOOKS/EDITED VOLUMES:**

#### **JOURNAL ARTICLES:**

1. **Gildor, H.**, and E. Tziperman, Sea ice as the glacial cycles' climate switch: Role of seasonal and orbital forcing, *Paleoceanography*, **15**, 605-615, 2000.
2. **Gildor, H.**, and E. Tziperman, A sea ice climate switch mechanism for the 100-kyr glacial cycles, *Journal of Geophysical Research-Ocean*, **106**, 9117-9133, 2001.
3. **Gildor, H.**, and E. Tziperman, Physical mechanisms behind biogeochemical glacial-interglacial CO<sub>2</sub> variations, *Geophysical Research Letters*, **28**, 2421-2424, 2001.
4. **Gildor, H.** and E. Tziperman, Sea-ice, the glacial cycles' climate switch, and inter-hemispheric thermohaline teleconnections, *Annals of Glaciology*, **23**, 501-506, 2001.

5. **Gildor, H.**, and M. Ghil, Phase relations between climate proxy records: Potential effect of seasonal precipitation changes, *Geophysical Research Letters*, **29**, doi: 10.1029/2001GL013781, 2002.
6. **Gildor, H.**, E. Tziperman, and J.R. Toggweiler, Sea ice switch mechanism and glacial-interglacial CO<sub>2</sub> variations, *Global Biogeochemical Cycles*, **16**, doi: 10.1029/2001GB001446, 2002.
7. Tziperman, E. and **H. Gildor**, The stabilization of the thermohaline circulation by the temperature-precipitation feedback, *Journal of Physical Oceanography*, **32**, 2704-2714, 2002.
8. Crosta, X., A. Shemesh, M.E. Salvignac, **H. Gildor**, and R. Yam, Late Quaternary variations of elemental ratio (C/Si and N/Si) in diatom-bound organic matter from the Southern Ocean, *Deep Sea Research Part II*, **49**, 1939-1952, 2002.
9. Tziperman, E. and **H. Gildor**, On the mid-Pleistocene transition to 100-kyr glacial cycles and the asymmetry between glaciation and deglaciation times, *Paleoceanography*, **18**, doi: 10.1029/2001PA000627, 2003.
10. **Gildor, H.** and E. Tziperman, Sea-ice switches and abrupt climate change. *Philosophical Transactions of the Royal Society of London A*, **361**, 1935-1944, 2003.
11. **Gildor, H.**, A.H. Sobel, M.A. Cane, and R.N. Sambrotto, A role for ocean biota in the genesis of tropical intraseasonal atmospheric variability, *Geophysical Research Letters*, **30**, doi: 10.1029/2002GL016759, 2003.
12. Timmermann, A., **H. Gildor**, M. Schulz, and E. Tziperman, Coherent resonant millennial-scale climate oscillations triggered by glacial meltwater pulses, *Journal of Climate*, **16**, 2569-2585, 2003.
13. Ashkenazy, Y., D.R. Baker, **H. Gildor**, and S. Havlin, Stochastic models for ice-ages, *Physica A*, **330**, doi: 10.1029/2003GL018099, 2003.
14. Sobel, A.H. and **H. Gildor**, A simple time-dependent model of SST hot spots, *Journal of Climate*, **16**, 3798-3992, 2003.
15. Ashkenazy, Y., D.R. Baker, **H. Gildor**, and S. Havlin, Nonlinearity and multifractality of climate change in the past 400,000 years, *Geophysical Research Letters*, **30**, doi: 10.1029/2003GL018099, 2003.
16. Ashkenazy, Y., D.R. Baker, and **H. Gildor**, Simple stochastic models for glacial dynamics, *Journal of Geophysical Research-Ocean*, **110**, doi: 10.1029/2004JC002548, 2005.
17. **Gildor, H.** and N.H. Naik, Evaluating the effect of interannual variations of surface chlorophyll on upper ocean temperature, *Journal of Geophysical Research-Ocean*, **110**, doi: 10.1029/2004JC002779, 2005.
18. Shepon, A., **H. Gildor**, L.J. Labrador, T. Butler, L.N. Ganzeveld, and M.G. Lawrence, Global lightning NO<sub>x</sub> deposition, *Journal of Geophysical Research-Atmosphere*, **112**, doi: 10.1029/2006JD007458, 2007.
19. Ben-Tzvi, O., M. Kiflawi, **H. Gildor**, and A. Abelson, Possible effects of downwelling on the recruitment of coral reef fishes to the Eilat (Red-Sea) coral reefs, *Limnology and Oceanography*, **52**, 2618-2628, 2007.
20. Silverman, J. and **H. Gildor**, The residence time of an active versus a passive tracer in the Gulf of Eilat: a box model approach, *Journal of Marine Systems*, **71**, 159-170, doi: 10.1016/j.jmarsys.2007.06.007, 2008.

21. Biton, E., **H. Gildor**, and W.R. Peltier, Red sea during the last glacial maximum: Implications for sea level reconstruction, *Paleoceanography*, **23**, doi: 10.1029/2007PA001431, 2008.
22. Shepon, A. and **H. Gildor**, The Lightning-Biota Climatic Feedback, *Global Change Biology*, **14**, 440-450, doi: 10.1111/j.1365-2486.2007.01501.x, 2008.
23. Ashkenazy, Y. and **H. Gildor**, Timing and significance of maximum and minimum equatorial insolation, *Paleoceanography*, **23**, doi: 10.1029/2007PA001436, 2008.
24. Bar-Or, R., C. Erlick, and **H. Gildor**, The role of dust in glacial-interglacial cycles, *Quaternary Science Reviews*, **27**, 201-208, doi: 10.1016/j.quascirev.2007.10.015, 2008.
25. **Gildor, H.**, The bottom Ekman layer and the apparent violation of the maximum principle, *Geophysical and Astrophysical Fluid Dynamics*, **102**, 593-599, 2008.
26. Ashkenazy, Y., Y. Feliks, **H. Gildor**, and E. Tziperman, Asymmetry of temperature records, *Journal of the Atmospheric Sciences*, **65**, 3327-3336, 2008.
27. Biton, E., J. Silverman, and **H. Gildor**, Observations and modeling of a pulsating density current, *Geophysical Research Letters*, **35**, doi: 10.1029/2008GL034123, 2008.
28. **Gildor, H.**, E. Fredj, J. Steinbuck, and S. Monismith, Evidence for submesoscale barriers to horizontal mixing in the ocean from current measurements and aerial-photographs, *Journal of Physical Oceanography*, **39**, 1975-1983, doi: 10.1175/2009JPO4116.1, 2009.
29. Lekien, F. and **H. Gildor**, Computation and approximation of the length scales of harmonic modes with application to the mapping of surface currents in the Gulf of Eilat, *Journal of Geophysical Research-Ocean*, **114**, doi: 10.1029/2008JC004742, 2009.
30. Ashkenazy, Y. and **H. Gildor**, Long-range temporal correlations of ocean surface currents, *Journal of Geophysical Research-Ocean*, **114**, doi: 10.1029/2008JC005235, 2009.
31. Carlson, D., P.A. Muscarella, **H. Gildor**, B.L. Lipphardt, Jr., and E. Fredj, How useful are Progressive Vector Diagrams for studying coastal ocean transport? *Limnology and Oceanography: Methods*, **8**, 98-106, 2010.
32. **Gildor, H.**, E. Fredj, and A. Kostinski, The Gulf of Eilat/Aqaba: a Natural Driven Cavity? *Geophysical and Astrophysical Fluid Dynamics*, **104**, 301-308, doi: 10.1080/03091921003712842, 2010.
33. Biton, E., **H. Gildor**, G. Trommer, M. Siccha, M. Kuchera, M. T.J. Van der Meer, and S. Schouten, Sensitivity of Red Sea circulation to monsoonal variability during the Holocene: An integrated data and modeling study, *Paleoceanography*, **25**, doi: 10.1029/2009PA001876, 2010.
34. Carlson, D., E. Fredj, **H. Gildor**, and V. Rom-Kedar, Deducing an upper bound to the horizontal eddy diffusivity using a stochastic Lagrangian model, *Environmental Fluid Mechanics*, **10**, 499-520, doi: 10.1007/s10652-010-9181-0, 2010.
35. Ashkenazy, Y., I. Eisenman, **H. Gildor**, and E. Tziperman, The effect of Milankovitch variations in insolation on equatorial seasonality, *Journal of Climate*, **23**, 6133-6142, doi: 10.1175/2010JCLI3700.1, 2010.

36. Bar-Or, R., **H. Gildor** and C. Erlick, The aerosol cloud fraction effect on cellular marine stratocumulus and its contribution to glacial-interglacial cycles, *Journal of Geophysical Research-Atmosphere*, **116**, doi: 10.1029/2010JD014470, 2011.
37. Biton, E. and **H. Gildor**, The general circulation of the Gulf of Eilat/Aqaba revisited: The interplay between the exchange flow through the Straits of Tiran and surface fluxes, *Journal of Geophysical Research-Ocean*, **116**, doi: 10.1029/2010JC006860, 2011.
38. Biton, E. and **H. Gildor**, Stepwise seasonal restratification and the evolution of salinity minimum in the Gulf of Eilat/Aqaba, *Journal of Geophysical Research-Ocean*, **116**, doi: 10.1029/2011JC007106, 2011.
39. Biton, E. and **H. Gildor**, The coupling between exchange flux through a strait and dynamics in a small convectively driven marginal sea: The Gulf of Eilat/Aqaba, *Journal of Geophysical Research-Ocean*, **116**, doi: 10.1029/2011JC006944, 2011.
40. Ashkenazy, Y. and **H. Gildor**, On the probability and spatial distribution of ocean surface currents, *Journal of Physical Oceanography*, **41**, 2295-2306, doi: 10.1175/JPO-D-11-04.1, 2011.
41. Tziperman, E., D.S. Abbot, Y. Ashkenazy, **H. Gildor**, D. Pollard, C.G. Schoof, and D.P. Schrag, Continental constriction and oceanic ice-cover thickness in a Snowball-Earth scenario, *Journal of Geophysical Research-Ocean*, **117**, doi: 10.1029/2011JC007730, 2012.
42. Carlson, D.F., E. Fredj, **H. Gildor**, E. Biton, J.V. Steinbuck, S.G. Monismith, A. Genin, Observations of tidal currents in the northern Gulf of Eilat/Aqaba (Red Sea), *Journal of Marine Systems*, **102-104**, 14-28, doi: 10.1016/j.jmarsys.2012.04.008, 2012.
43. Aharon, R., V. Rom-Kedar, and **H. Gildor**, When complexity leads to simplicity: Ocean surface mixing simplified by vertical convection, *Physics of Fluids*, **24**, doi: 10.1063/1.4719147, 2012.
44. Biton, E. and **H. Gildor**, The seasonal effect in one-dimensional Daisyworld, *Journal of Theoretical Biology*, **314**, 145-156, doi: 10.1016/j.jtbi.2012.08.043, 2012.
45. Ashkenazy, Y., M. Losch, **H. Gildor**, D. Mirzayof, and E. Tziperman, Multiple sea-ice states and abrupt MOC transitions in a general circulation ocean model, *Climate Dynamics*, **40**, 1803–1817, doi: 10.1007/s00382-012-1546-2, 2013.
46. Ashkenazy, **H. Gildor**, Y., M. Losch, F.A. Macdonald, D.P. Schrag, and E. Tziperman, Dynamics of a Snowball Ocean, *Nature*, **495**, 90-93, doi: 10.1038/nature11894, 2013.
47. Boss, E., **H. Gildor**, W. Slade, L. Sokoletsky, A. Oren, J. Loftin, Optical properties of the Dead Sea, *Journal of Geophysical Research-Ocean*, **118**, 1-9, doi: 10.1002/jgrc.20109, 2013.
48. Fine, M., **H. Gildor**, and A. Genin, A coral reef refuge in the Red Sea, *Global Change Biology*, **19**, 3640–3647, doi: 10.1111/gcb.12356, 2013.
49. **Gildor, H.**, Y. Ashkenazy, E. Tziperman, and I. Lev, The role of sea ice in the temperature-precipitation feedback of glacial cycles, *Climate Dynamics*, 10.1007/s00382-013-1990-7, 2014.

50. Ashkenazy, **H. Gildor**, Y., M. Losch, and E. Tziperman, Ocean circulation under globally glaciated Snowball Earth conditions: steady state solutions, *Journal of Physical Oceanography*, **44**, 24-43, doi: 10.1175/JPO-D-13-086.1, 2014.
  51. Carlson, D.F., E. Fredj, **H. Gildor**, The annual cycle of vertical mixing and restratification in the northern Gulf of Eilat/Aqaba (Red Sea) based on high temporal and vertical resolution observations, *Deep Sea Research Part I*, **84**, 1-17, 2014.
  52. Biton, E. and **H. Gildor**, The energy balance of the Gulf of Eilat/Aqaba (northern Red Sea), *Journal of Physical Oceanography*, **44**, 1954-1972, doi: 10.1175/JPO-D-13-0220.1, 2014.
  53. Mundel, R., E. Fredj, **H. Gildor**, and V. Rom-Kedar, New Lagrangian diagnostics for characterizing fluid flow mixing, *Physics of Fluids*, **26**, doi: 10.1063/1.4903239, 2014.
  54. Afargan, H. and **H. Gildor**, The role of the wind in the formation of coherent eddies in the Gulf of Eilat/Aqaba, *Journal of Marine Systems*, **142**, 75-95, doi: 10.1016/j.jmarsys.2014.09.006, 2015.
  55. Bar-Yosef Mayer, D.E., Y. Kahanov, J. Roskin, and **H. Gildor**, Neolithic voyages to Cyprus: Wind patterns, routes and mechanisms, *Journal of Island & Coastal Archaeology*, doi: 10.1080/15564894.2015.1060277, 2015.
  56. Siccha, M., E. Biton, and **H. Gildor**, Red Sea circulation during Marine Isotope Stage 5e, *Paleoceanography*, doi: 10.1002/2013PA002603, 2015.
- Ashkenazy, **H. Gildor**, Y., and G. Bel, The effect of stochastic wind on the infinite depth Ekman layer model, *European Physical Letters*, doi:10.1209/0295-5075/111/39001, 2015.

#### BOOK CHAPTERS:

1. **Gildor, H.**, Glacial-interglacial CO<sub>2</sub> variations, in M. Follows and T. Oguz (Eds.), *The ocean carbon cycle and climate*, 317-352, Kluwer Academic Publishers, 2004.
2. Sobel, A.H., C.S. Bretherton, **H. Gildor**, and M. Peters, Convection, cloud-radiative feedbacks and thermodynamic ocean coupling in simple models of the Walker circulation, in *Earth's Climate: The Ocean-Atmosphere Interaction*, C. Wang S.-P. Xie, and J. A. Carton, Eds., American Geophysical Union, *Geophysical Monograph*, **147**, 393-405, 2004.
3. **Gildor, H.**, The general circulation in the Gulf of Eilat, in "The Glory of the Sea: Stability and Change in the Aquatic Systems of Israel" (Ed. Noga Stambler), The Israeli Association of Aquatic Sciences, 2013 (in Hebrew).



4. **Gildor**, H., Paleoclimate over the Red Sea since the Last Glacial Maximum, in “The Glory of the Sea: Stability and Change in the Aquatic Systems of Israel” (Ed. Noga Stambler), The Israeli Association of Aquatic Sciences, 2013 (in Hebrew).
5. Carlson, D.F., A.G. Ostrovskii, K. Konstantin, and **H. Gildor**, Moored automatic mobile profilers and their applications, in “Advances in Marine robotics” (Ed. Oren Gal), 169-206, LAP LAMBERT Academic Publishing, 2013.
6. Y. Masumoto, M. Nagura, S-P Xie, P. N. Vinayachandran, T. Miyama, Z. Yu, J. P. McCreary, Jr., R. R. Hood, **H. Gildor**, “Ocean processes relevant to climate variations in the Indian Ocean sector”, in Climate Variability and Predictability, Eds. Behera and Yamagata, Asia Pacific Weather and Climate Vol. 8, World Scientific (in press).