









## Israel National Bathymetric Survey (NBS).

A cooperative project between the GSI, IOLR, and MAPI

John K. Hall



Aharon (Ronnie) Sade

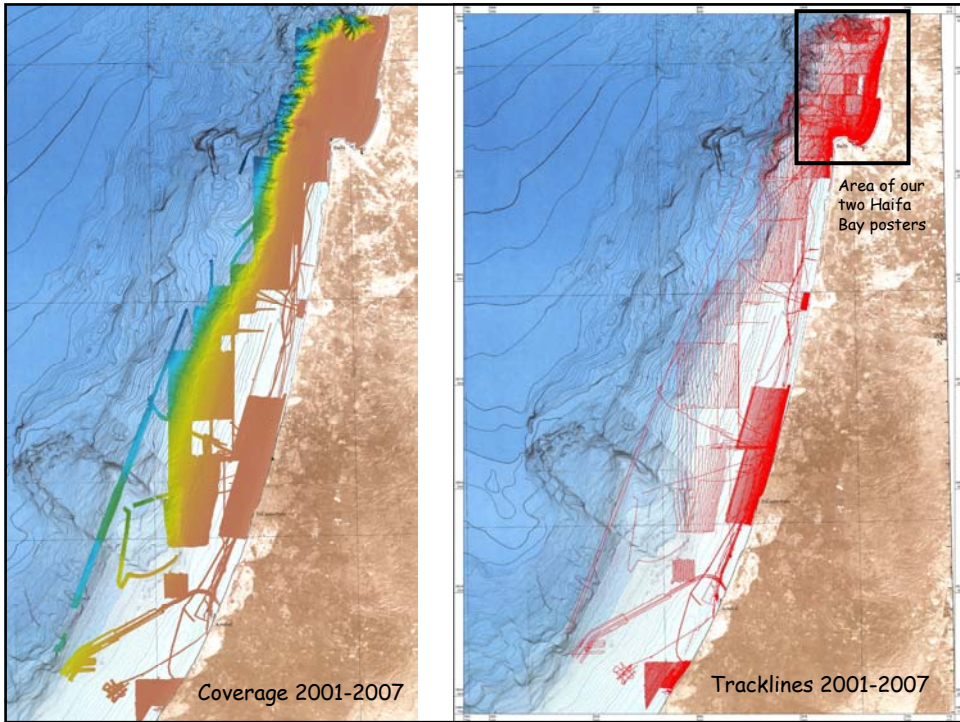
Arik Golan

Gideon Amit

Limor Gur-Arieh

Use of a Kongsberg Simrad EM1002 multibeam sonar to map the Israeli offshore

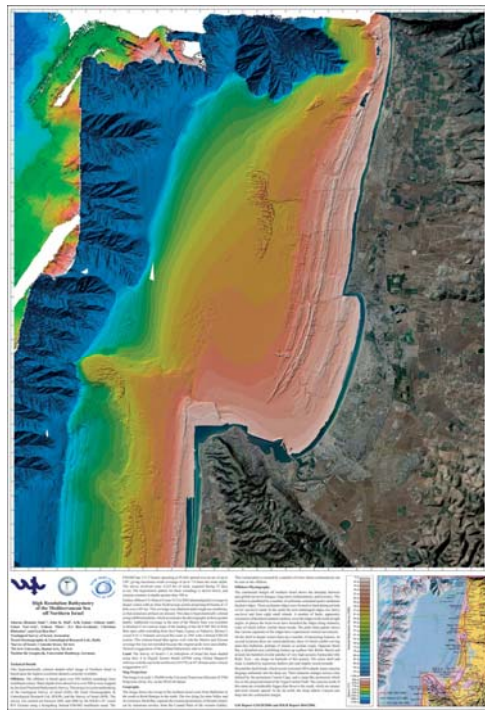


**High Resolution Bathymetry of the Mediterranean off Northern Israel**

Sade A. R. (1,4), Hall J. K. (1), Golan A. (2), Amit G. (2), Gur-Arie L. (3), Tibor G. (2), Ben-Avraham Z. (4), Hubscher C. (5), and Ben-Dor E. (4).

- 1. Geological Survey of Israel, Jerusalem , Israel
- 2. Israel Oceanographic & Limnological Research Ltd., Israel
- 3. Survey of Israel, Tel Aviv , Israel
- 4. Tel Aviv University, Tel Aviv , Israel
- 5. Institut für Geophysik, Universität Hamburg, Germany

4218 km of track,  
840.4 million soundings

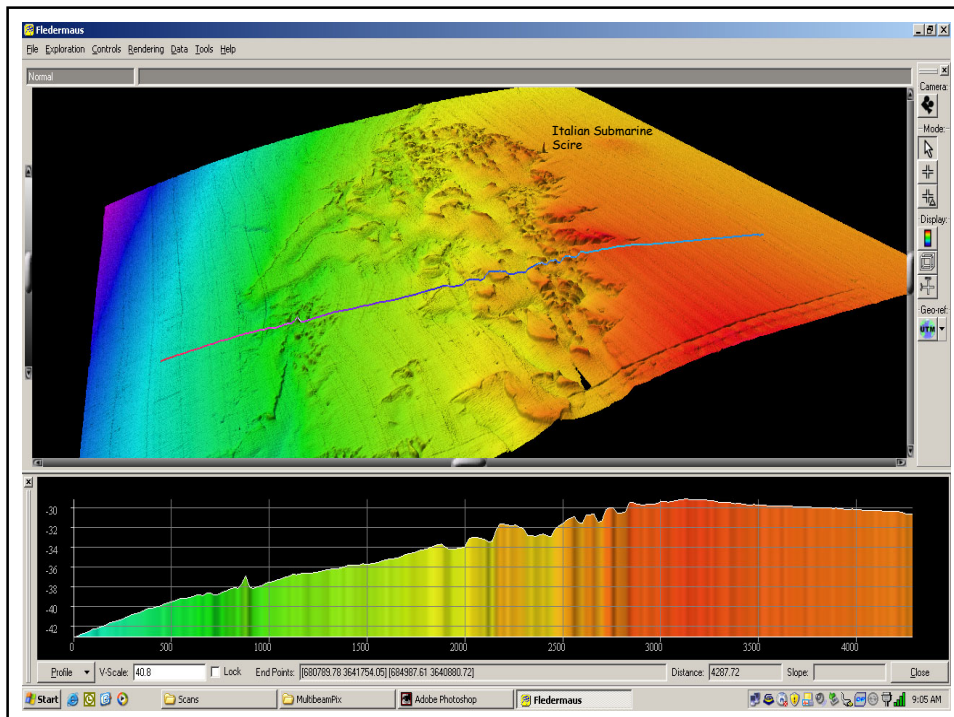


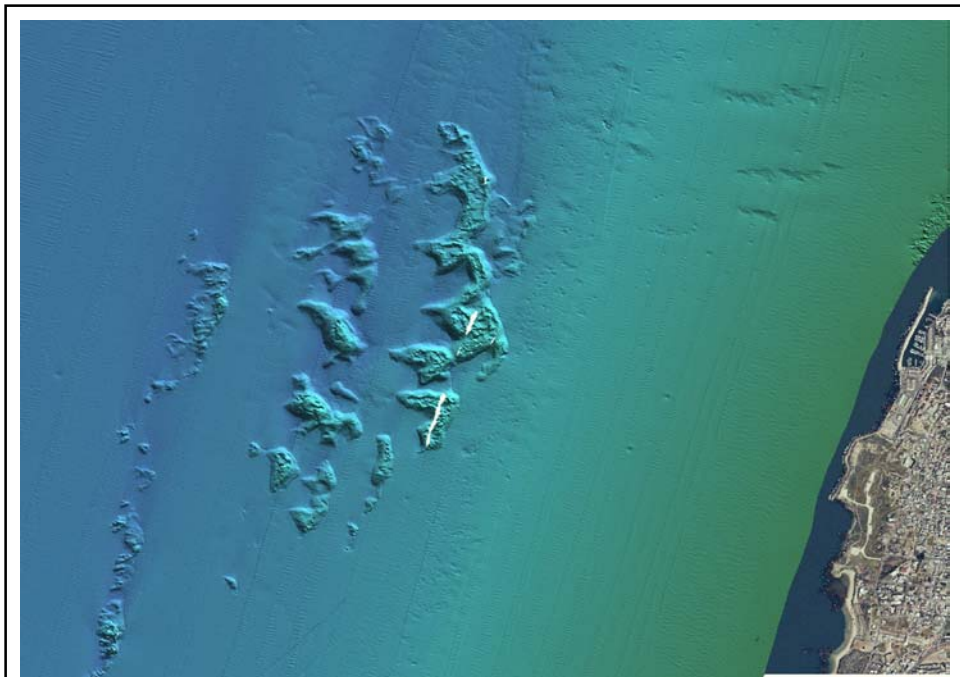
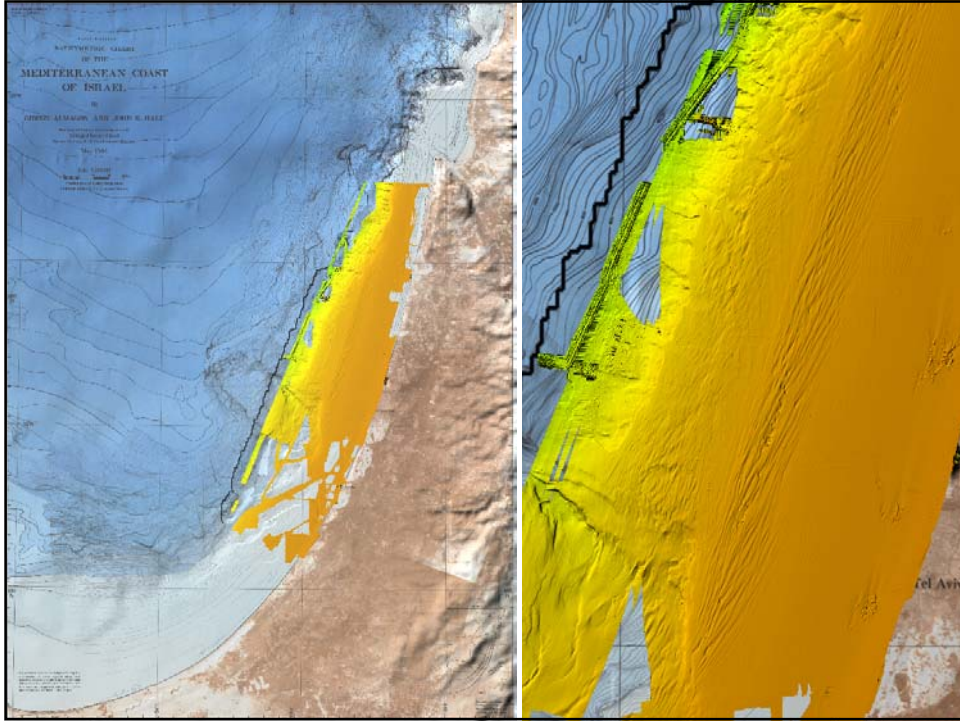
### Acoustic Backscatter at 95 kHz from the Seafloor off Northern Israel

Sade A. (1,4), Hall J. K. (1), Golan A.(2), Amit, G. (2), Gur-Arieh L. (3), Tibor G. (2), Ben-Avraham Z. (4), Ben-Dor E. (4), Fonseca L. (5), Calder B. R. (5), Mayer L. A. (5), and de Moustier C. P. (5)

1. Geological Survey of Israel, Jerusalem, Israel
2. Israel Oceanographic & Limnological Research Ltd., Israel
3. Survey of Israel, Tel Aviv, Israel
4. Tel Aviv University, Tel Aviv 69978, Israel
5. Center for Coastal & Ocean Mapping, University of New Hampshire, Durham, NH, USA

Geocoder backscatter - ~30 billion measurements





Kurkar 'ridges' off Jaffa Port - note pockmarks, and depressions found only north of the headland

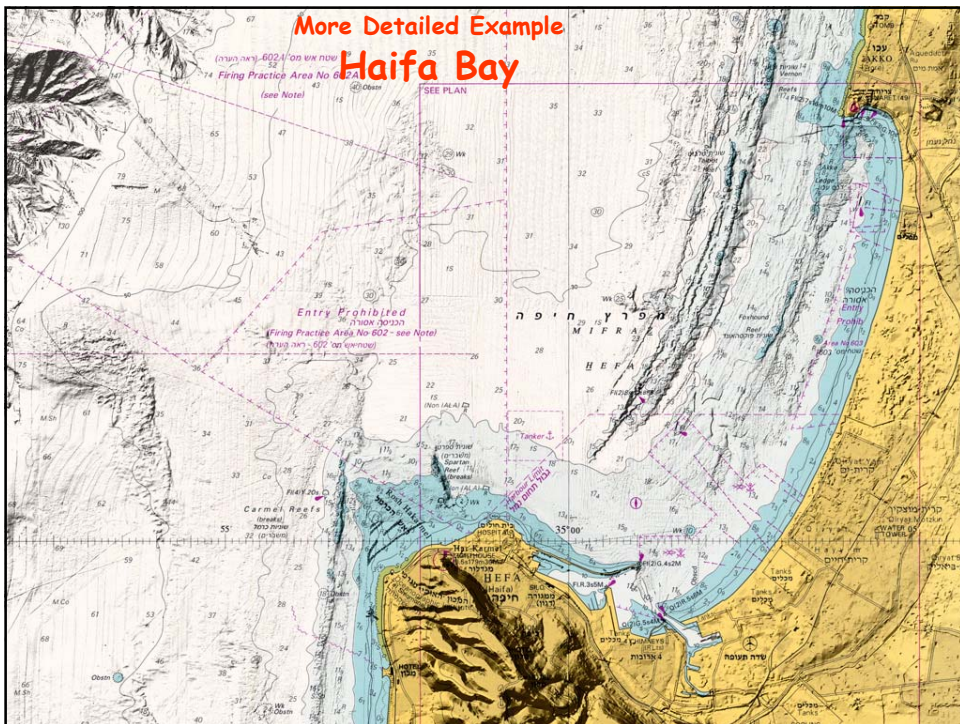


**Modification of a UKHO-SOI Navigational Chart**

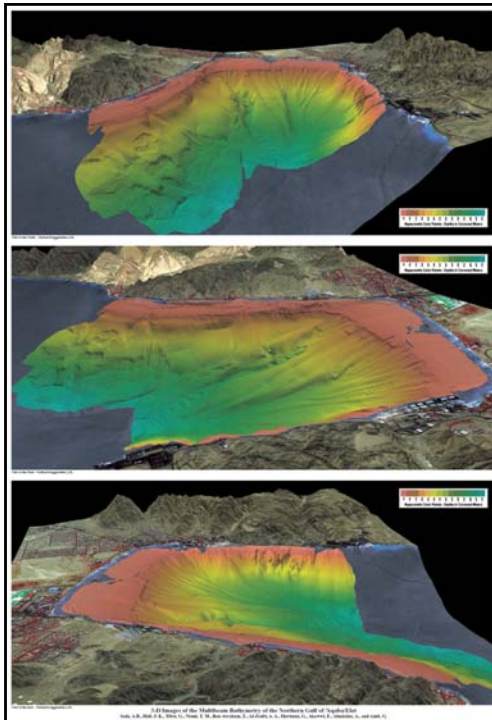
The 4 m grids shown in the Haifa Bay poster were used to texturize a section of Chart 1585 in order to give the navigator a far superior representation of the seafloor.

Depths, sediment types and other information for piloting are still very discernable on the chart.

Simple Global Mapper 9.02 software was used to make this example.





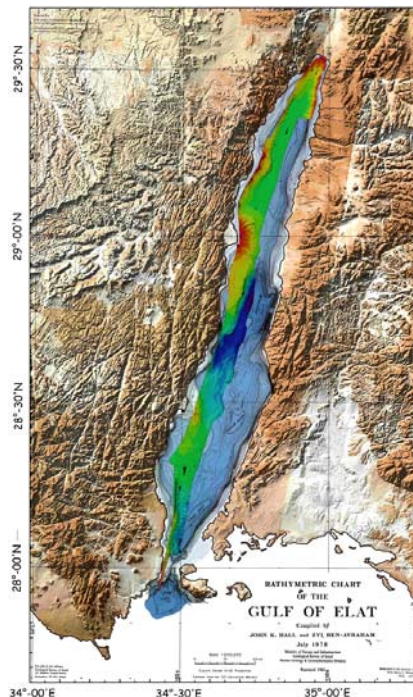
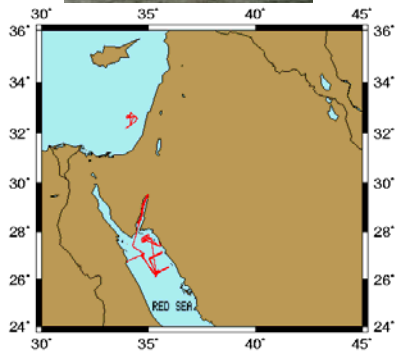


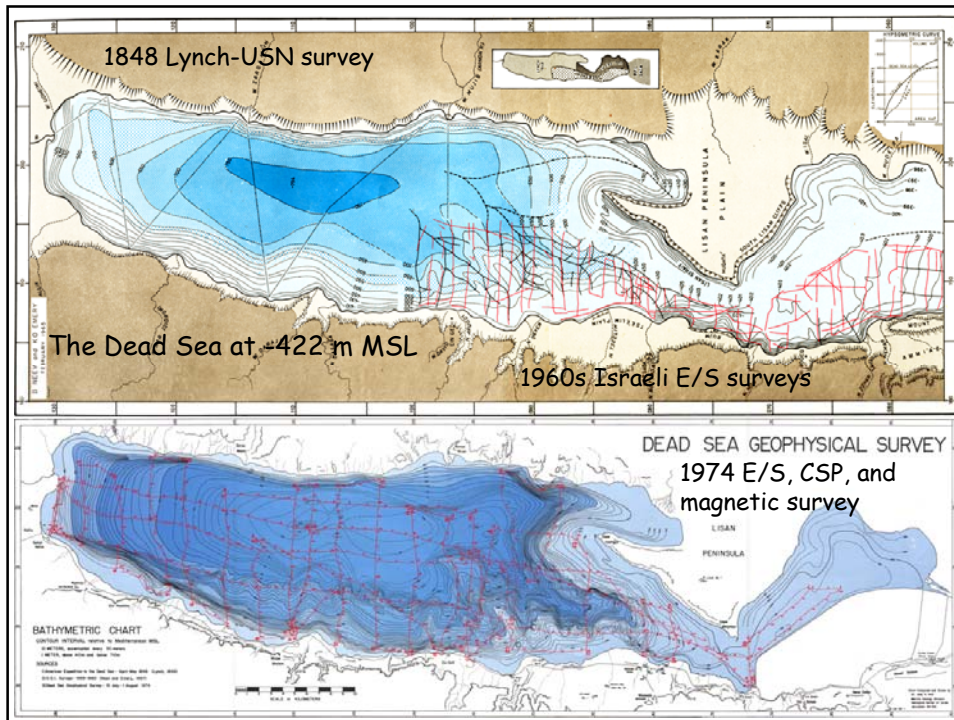
The backside of this laminated poster showed perspective views from the south (top), east (Jordan - middle), and west (Israel - bottom).

Copies of these laminated posters are available free of charge at the booth of the Survey of Israel

**More Multibeam Coverage** (Atlas DS-2 Hydrosweep) of the western Gulf of Eilat, taken by the F/S METEOR during Cruise 44/3 (12 March - 7 April 1999).

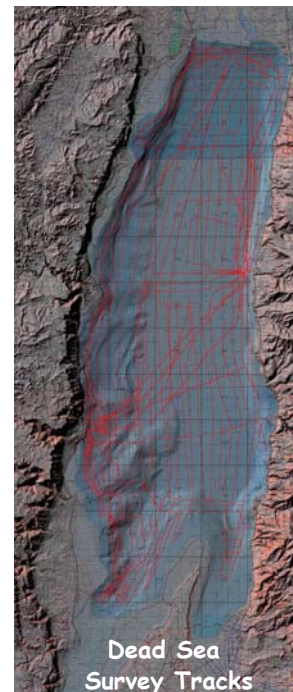
Gridded at 30 m, and merged with 30 m ASTER topography.



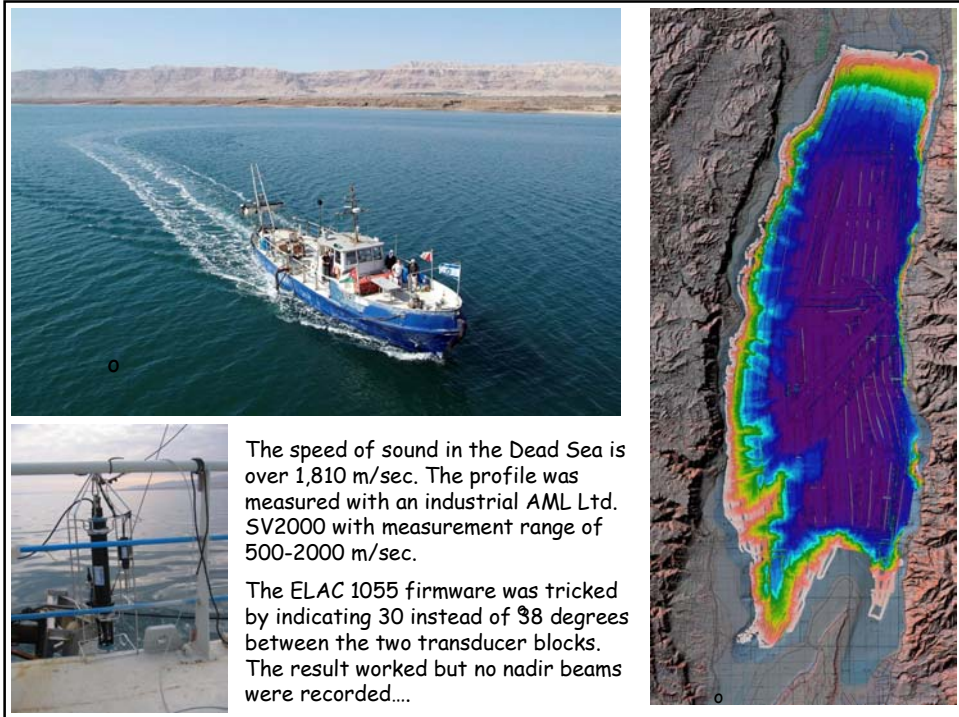


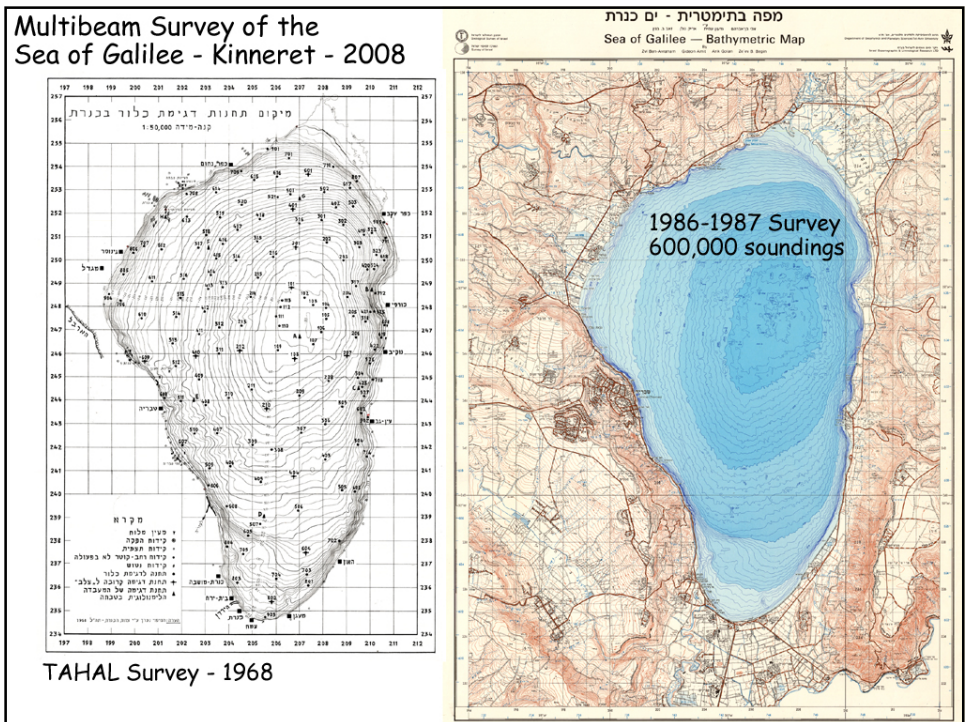
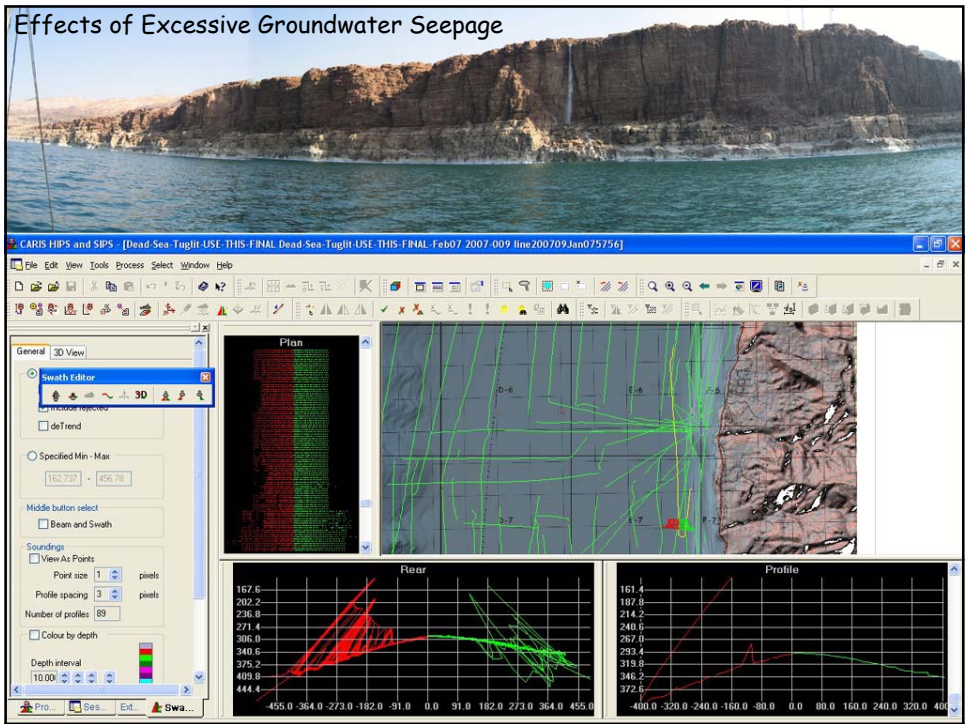
**The Dead Sea  
Multibeam/Magnetic Survey**  
Joint Jordanian-Israeli project  
9 Jan - 2 Feb 2007 (21 Days)

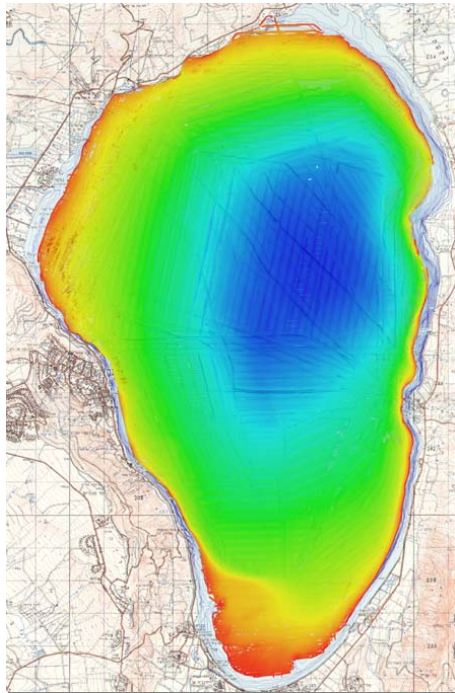
R/V Taglit (Discovery) at Ein Gedi - Built at the Dead Sea in 2004 -  
60 tons, 23 m overall











The survey lasted 7 weeks from end May to beginning of July 2008.

Track length was 1600 km. Some 38 million soundings were recorded.

325 hours of multibeam survey with an ELAC Seabeam 1180 with 126 beams at 180 kHz.

Depths from 5 to 40 m. Swath width about 5 times the depth under the transducer.

Sparker survey around the periphery - where gas does not produce an acoustic mirror.

Cesium magnetometer towed throughout.

The recent survey of the freshwater Sea of Galilee (Lake Kinneret)



Over a 7 week period in May and June 2008 a detailed survey was carried out in the Sea of Galilee (Lake Kinneret). Above the aluminum jet-boat (R/V Lillian).



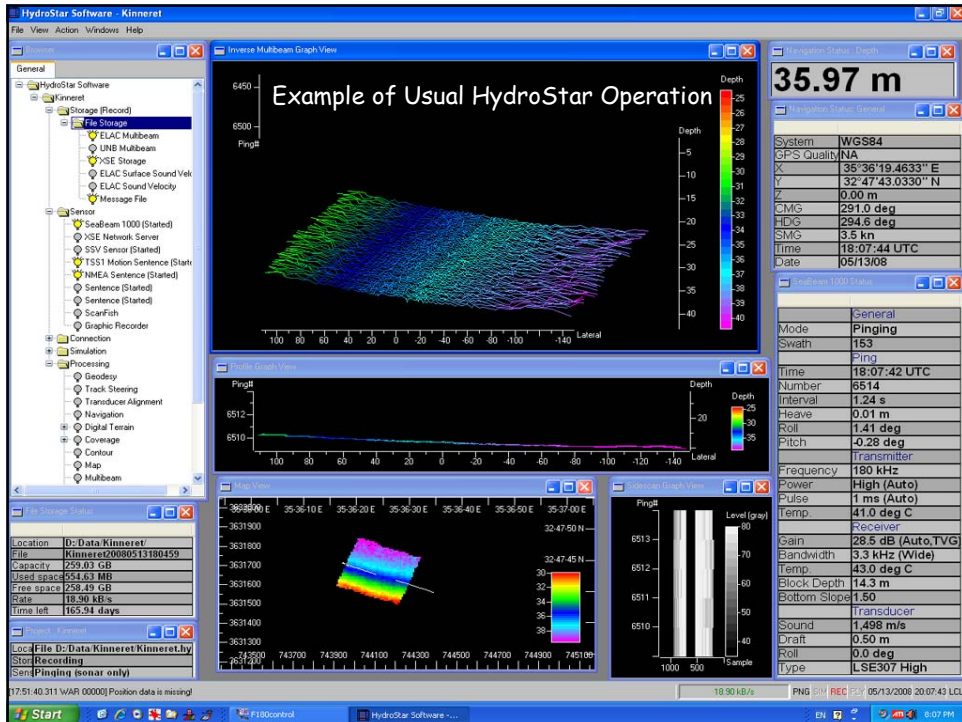
A sparker survey was carried out on a tight grid, along with multibeam with a rented ELAC SeaBeam 1180 system, and Geometrics Cesium magnetometer.

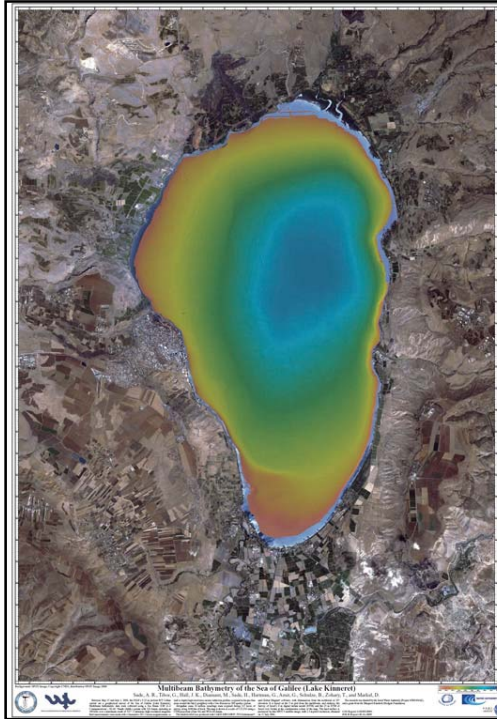


As with the Dead Sea survey, there was a certain degree of professional videography to document the work.



The work day began at 5AM, and after a break during the windy afternoon, continued until late at night. Here the R/V Lillian is seen against the mountains above Tiberias.

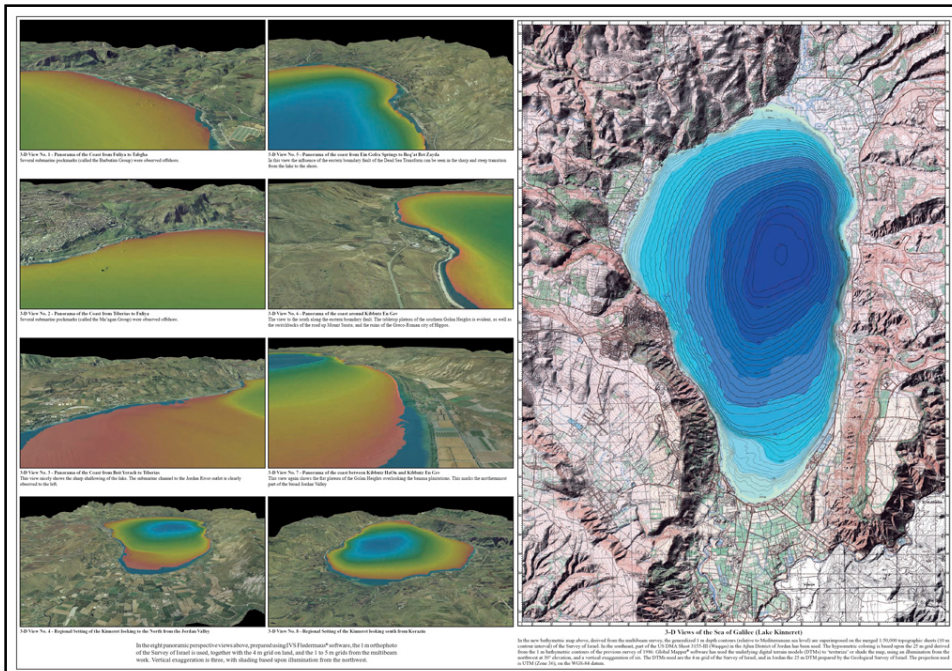




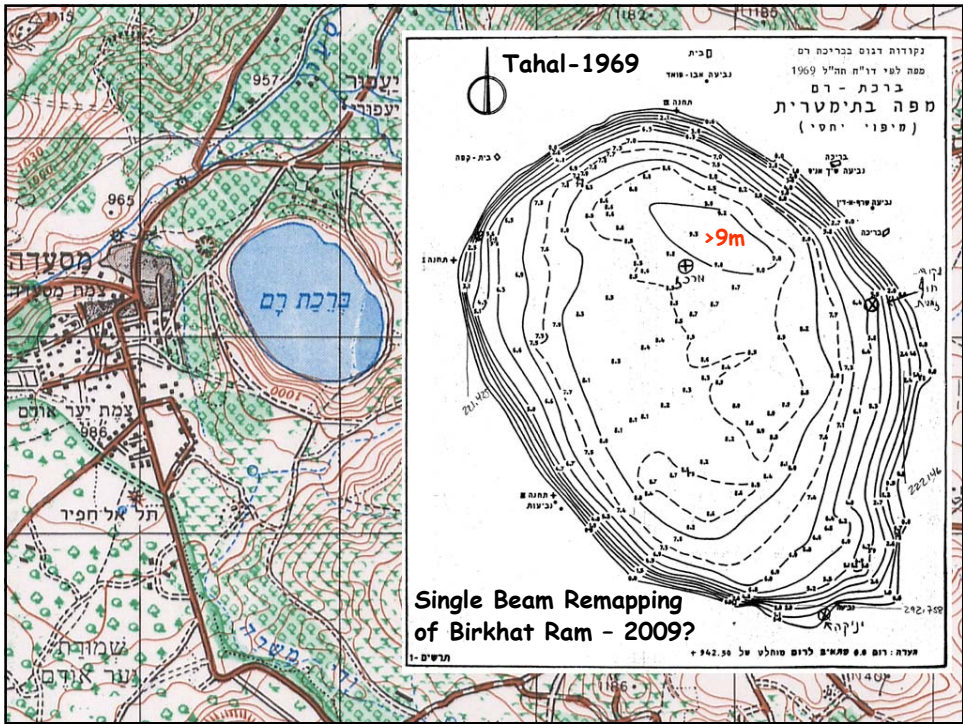
### Poster of the Sea of Galilee

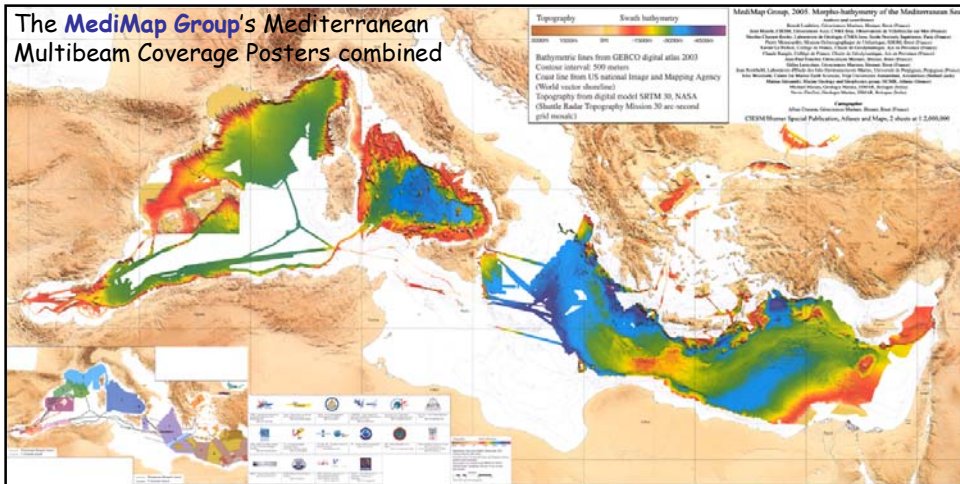
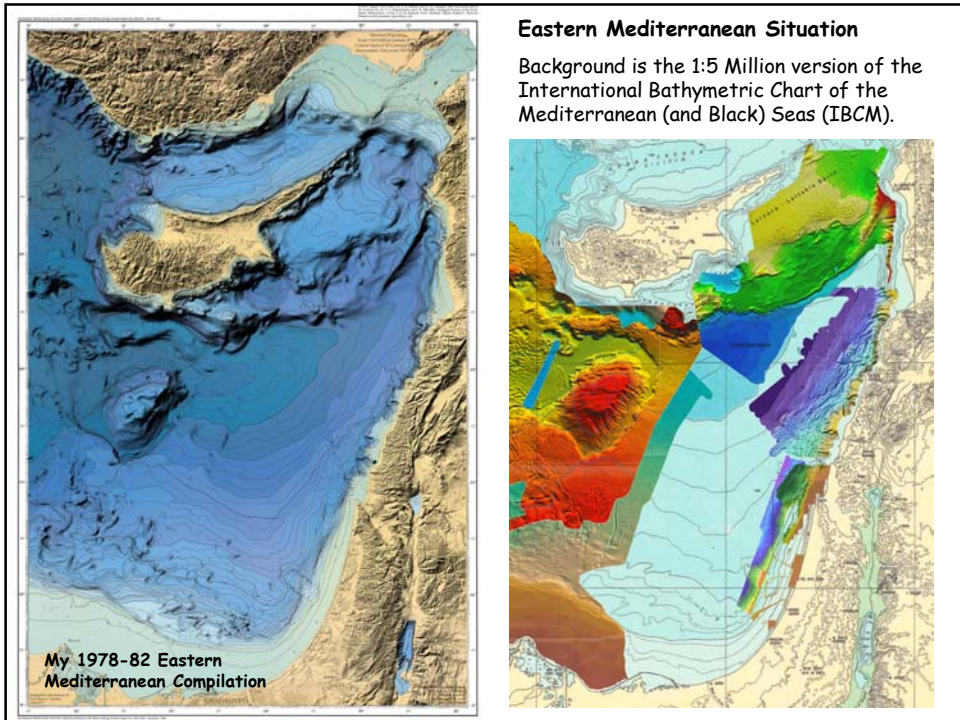
Land is a SPOT image with 2.5 m pixels, texturized with 4 m DTM of the Survey of Israel.

The mostly smooth lake floor is based on a 5 m multibeam DTM.



Backside of this poster. Generalized contours and 3-D views.



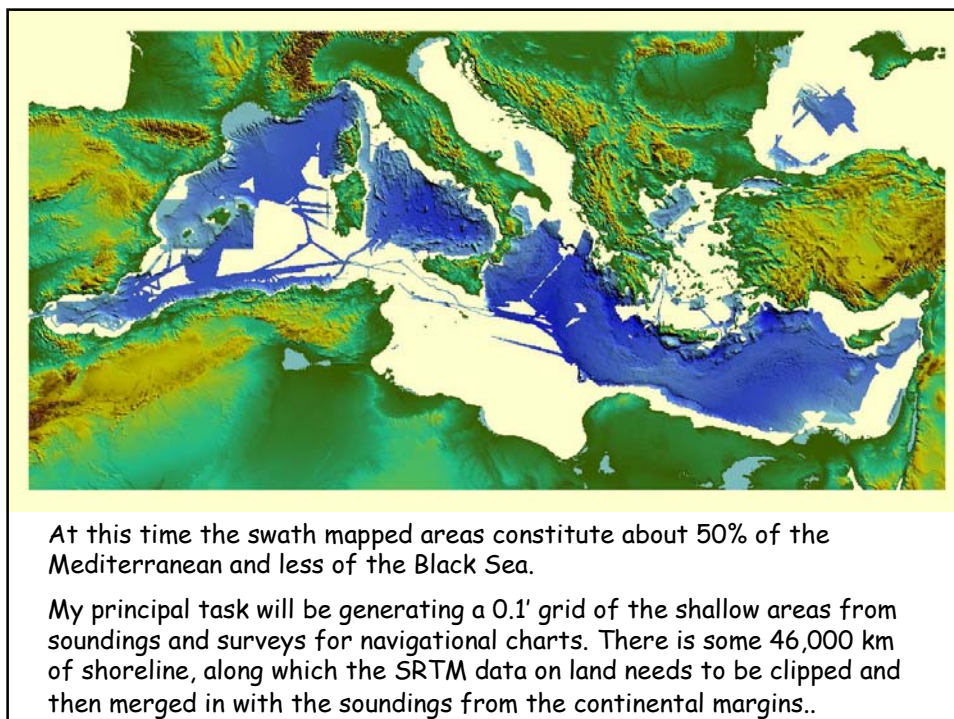
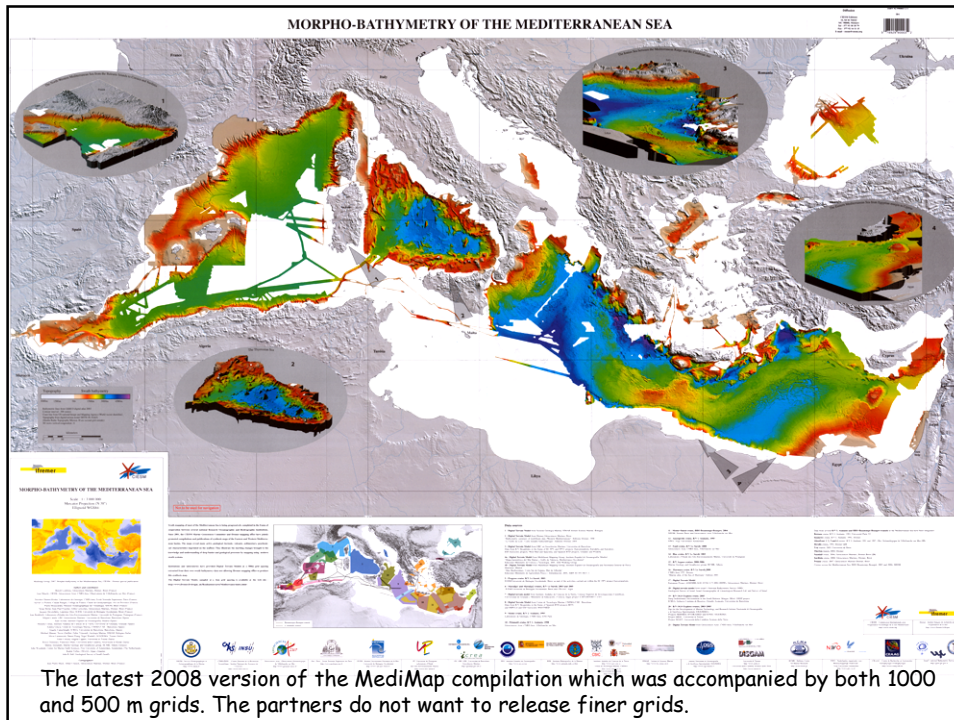


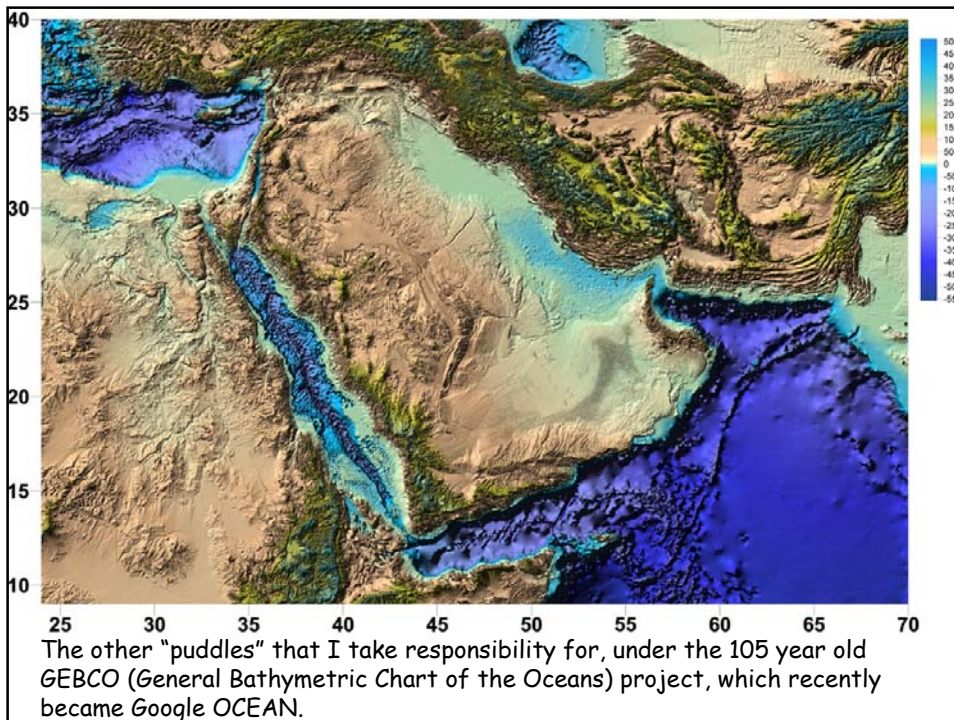
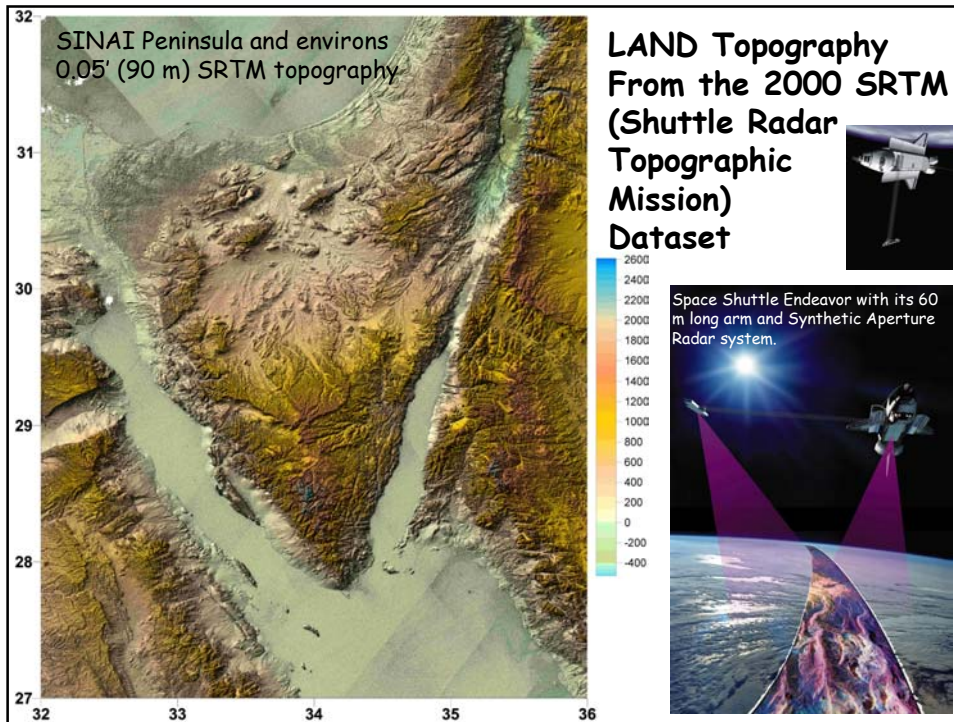
**The IHO-IOC IBCM-II 0.1' Bathymetric Grid for the Mediterranean (and Black) Sea**

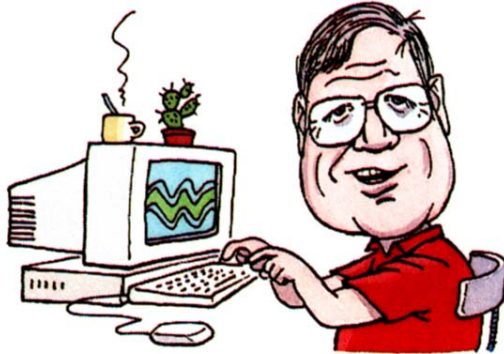
Dr. John K. Hall - Geological Survey of Israel (Retired)  
Vice Chairman, IBCM - International Bathymetric Chart of the Mediterranean  
Editor - IBCM-II bathymetric/topographic grid at 0.1'

(The Late) Prof. Carlo Morelli - Università degli Studi di Trieste, Trieste, Italy  
Chairman, IBCM - International Bathymetric Chart of the Mediterranean









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**Thank you for your attention**