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# A New Bathymetric Map of the Israeli EEZ: Preliminary Results


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A regional bathymetric map of the Eastern Mediterranean area was previously published in 1994, compiled from all the depth measurements available at the time. In recent years a large amount of new gridded bathymetric data was collected offshore Israel within the framework of research and hydrocarbon exploration activities.

The continuing interest in the Israeli EEZ (Exclusive Economic Zone) by oil and gas companies, academia and governmental agencies requires an up-to-date high resolution bathymetric grid of the EEZ. In this work we present a detailed bathymetric grid of the Israeli EEZ that was compiled from all available data sets.

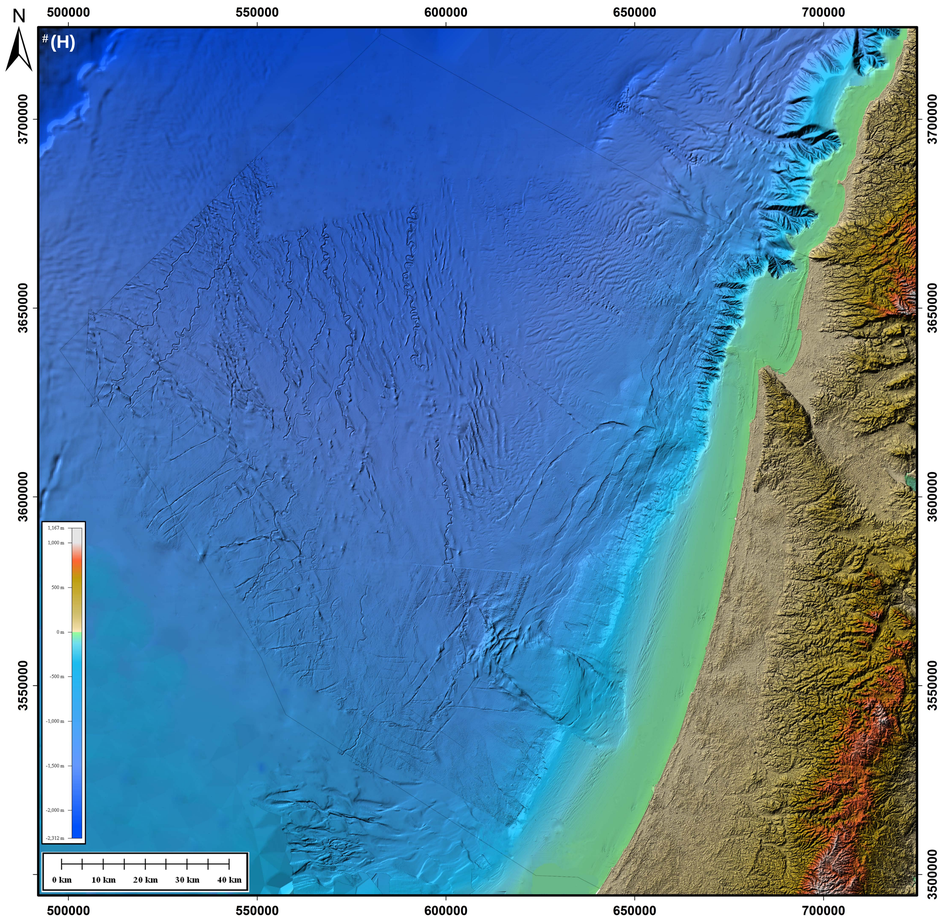
**Data Set s Used to Create the Map (sea details in images B & C)**

- Multibeam bathymetry acquired by IOLR between 2001-2010
- 3D Seismic Surveys
  - Southern Israel
  - Emed 2009 2010 Merge
  - Sara Myra
  - Arie
  - Pelagic
  - Neta Royee
  - Ruth C
- 2D Seismic Surveys
  - Horizon 1983
  - Isramco 1988
  - Isramco 1991
  - Petro Med
  - Spectrum 2001
  - TGS 2000
  - TGS 2008
- Legacy data sets
  - Northern Area
    - French Ifremer's 'Shalimar' EM302 survey by R/V Suroît in 2004 for the Lebanese government.
    - GSI-MGD seismic survey of Ras al Bayada during “Operation Litani” in 1978
    - Lebanese coastal and fishing charts
  - Northwestern Area
    - Medimap Group Mediterranean multibeam sonar compilation available to contributing members as a 500m grid.
  - Eastern Area
    - GSI-IOLR-SOI Israel NBS EM1002 multibeam sonar survey 2001-2013.
    - Oceana coastal pipeline survey done for the Ministry of National Infrastructures in 1999.
    - GSI-MGD reconnaissance seismic surveys 1971-80.
- The land data is from NASA METI ASTER2 30m GDEM global topographic dataset.

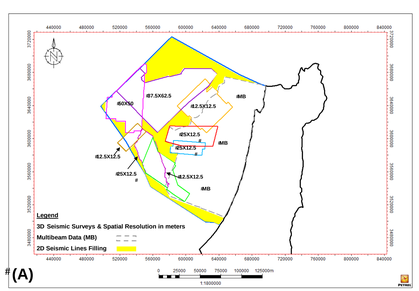
In the shallow area (10 to 1600 m below MSL) mapping is primarily based on multibeam. In the deeper part of the EEZ mapping is based on 2D and 3D seismic surfaces and well control. The 3D seismic sets used in this work consist of seven adjacent and overlapping seismic cubes (Fig. A). In areas with no multibeam or 3D seismic coverage, data from 2D seismic profiles was used (Fig. B). The depth to the sea-floor in the seismic data is correlated to the 'peak' of the first seismic reflection across the 3D cube or 2D profile. When the seismic data was available only in two-way travel time it was converted to depth using speed of sound in the water column (1520 m/s).

Working Steps

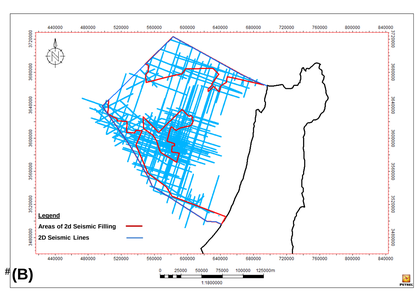
1. Manual picking of WB seismic reflector on 3D data (Fig. C)
2. Auto-picking of entire 3D cube (Fig. D)
3. Surface creation (spatial resolution as seismic data)
4. Depth conversion (where needed)
5. Surface adjustment to WB from well control (Fig. E)
6. Merge 3D surfaces (Fig. F)
7. Manual picking of WB seismic reflector on 2D lines
8. Create surface of 2D picking
9. Depth Conversion of surface
10. Merge 3D & 2D water bottom surfaces
11. Merge seismic water bottom surface with legacy & land data (Fig. G,H)



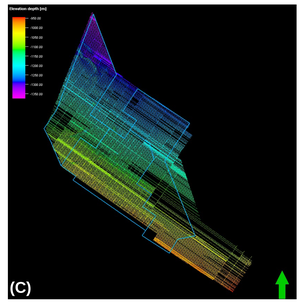

*1:120,000, UTM projection (WGS-84 datum – Zone 36).

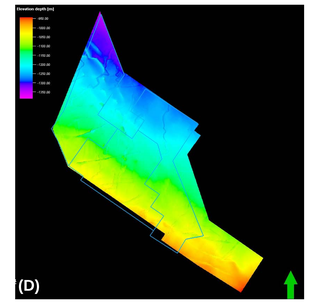



Spatial Resolution of Seismic 3D Surveys & Location of Multibeam Data.

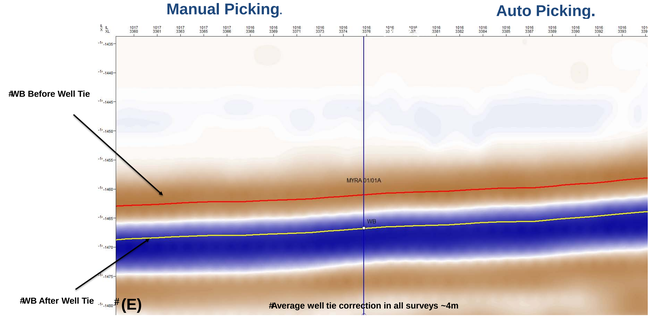



Areas of 2D Seismic Lines Filling.

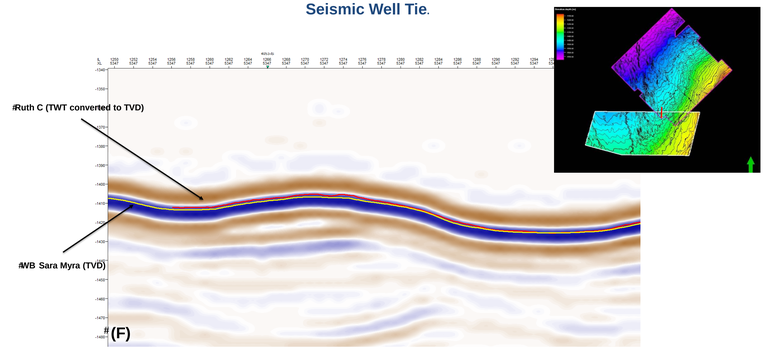


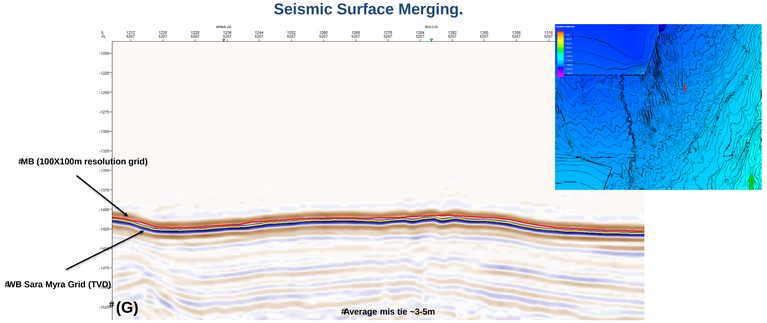

Manual Picking. Auto Picking.




Seismic Well Tie.




Seismic Surface Merging.




Seismic Surface & MB Data Merging.

The new bathymetric surface is complied from various data sets with different spatial resolutions (A). As a result there are areas with clear and distinct features while other areas show faded and non-continuous features. We plan to update the present surface with new multibeam surveys that will be conducted by the R/V Bat Galim which will be operational in 2015. A high resolution version of the bathymetric grid will be used by government agencies whereas a lower resolution version will be available to the general public.