

Response of the Geomorphic System to the Drop in the Dead Sea Level- Present Processes and Future Forecasts

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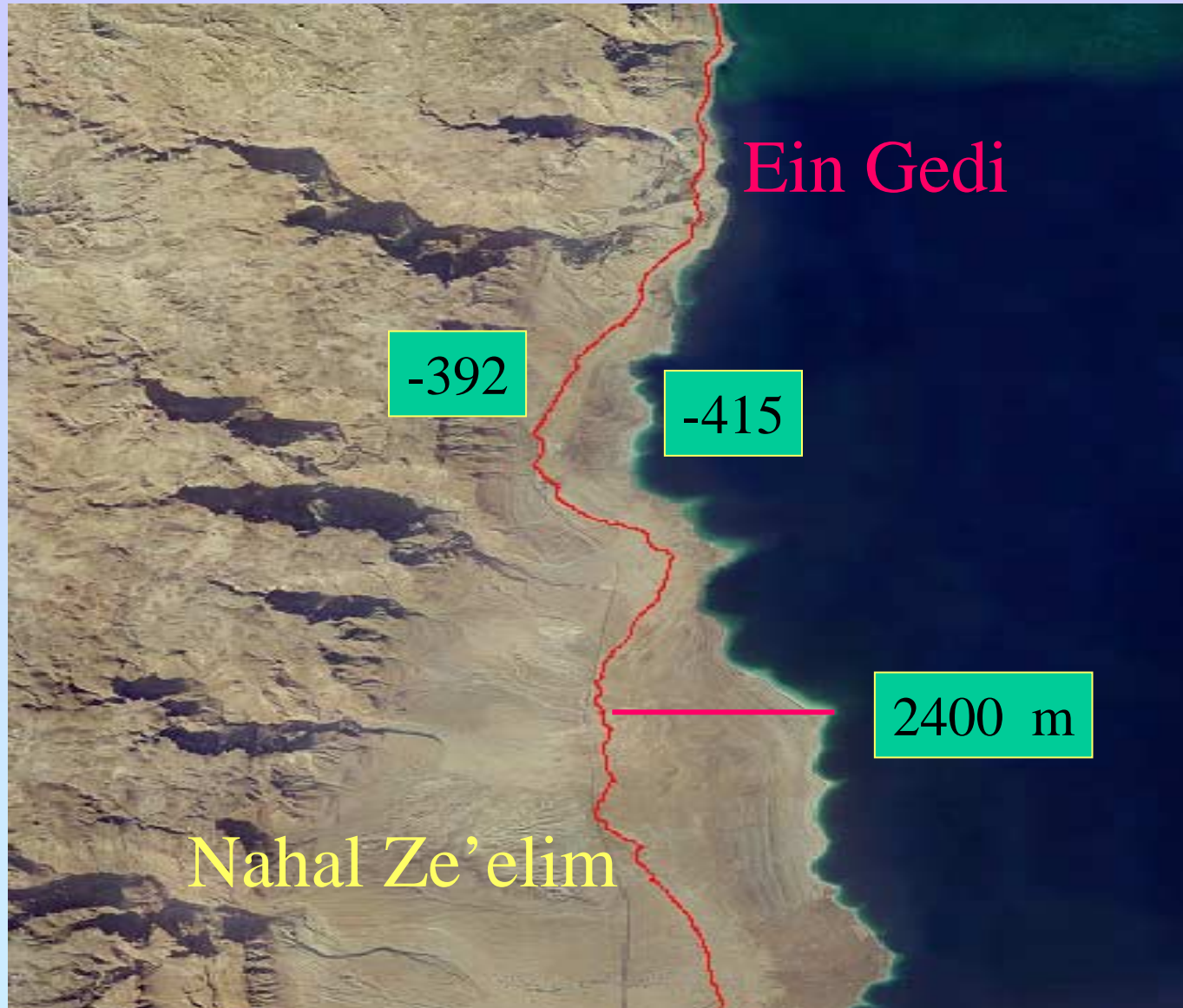
(1) Geological Survey of Israel

(2) Ramon Science Center

The geomorphic system



The 1930 shore line (in red) and in 2002



The retreat of the lake level along the northern coast since 1930



Up to 2500 m of mud flats exposed along the
Dead Sea coast



Steep morphology developed along the muddy shorelines resulted from the wave action



A winter storm hits the northwestern coast



Damage along the coast



Sinkholes flooded by spring water, Samar springs



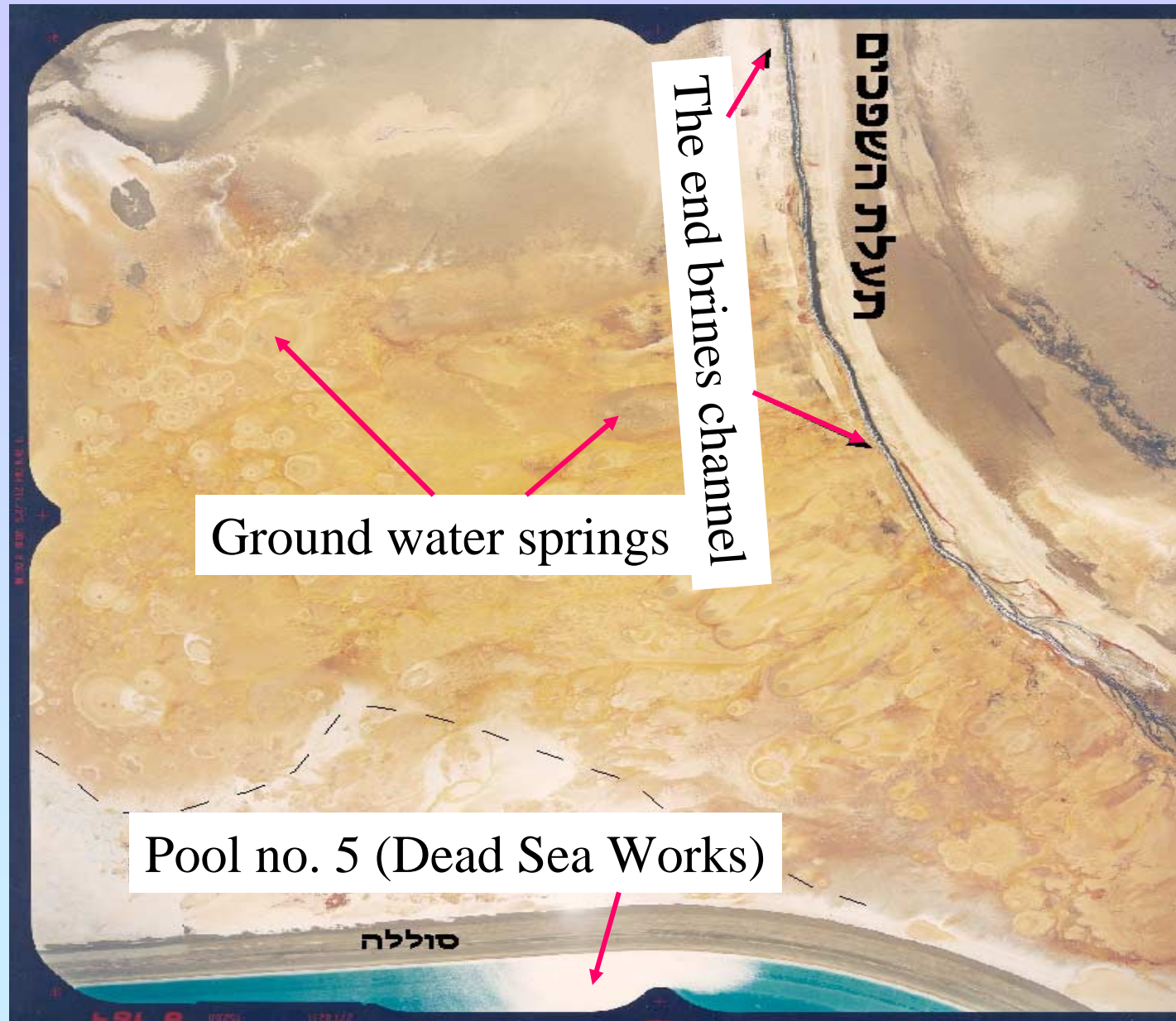
Incision and desiccation of the fan system along the Dead Sea coast



Lynch straights, large mud plain between the
northern and southern basins



Arial Photo of the Lynch Straights





Amasia Fault
and the
southern basin
of the Dead
Sea

Sinkholes along the Amazia fault



Nahal Darga flow into the Dead Sea, April 2003



Destruction of the Dead Sea road during flood, Nahal Darga, April 2003



Damage along the coast road after flood



After flood, Dead Sea coast



Small drainage basin causing damage to the Dead Sea road during local rainstorm, 10/2004



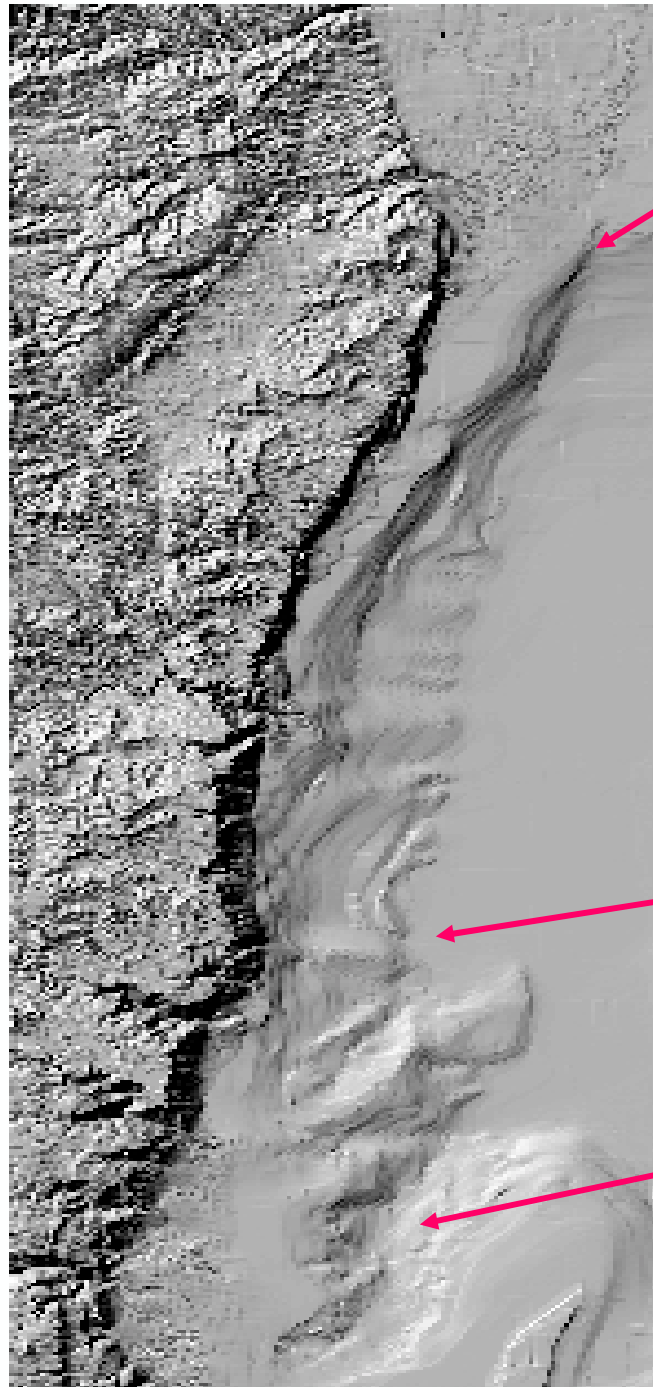
Channel incision exposing the foundation of a concrete bridge





Pipelines exposed by gully incision





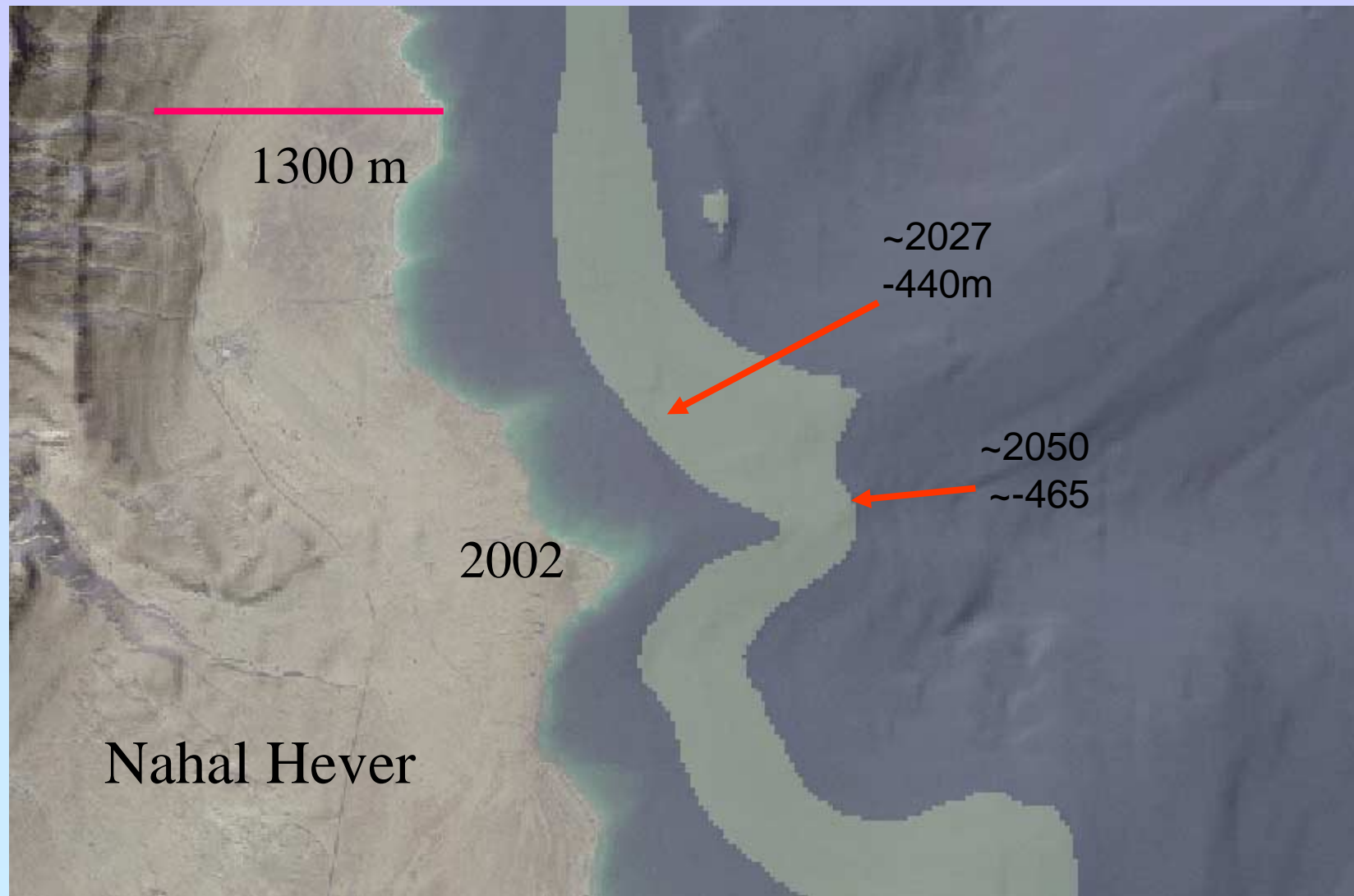
Northwestern coast

Bathymetric map of the Dead Sea (Hall, 1978)

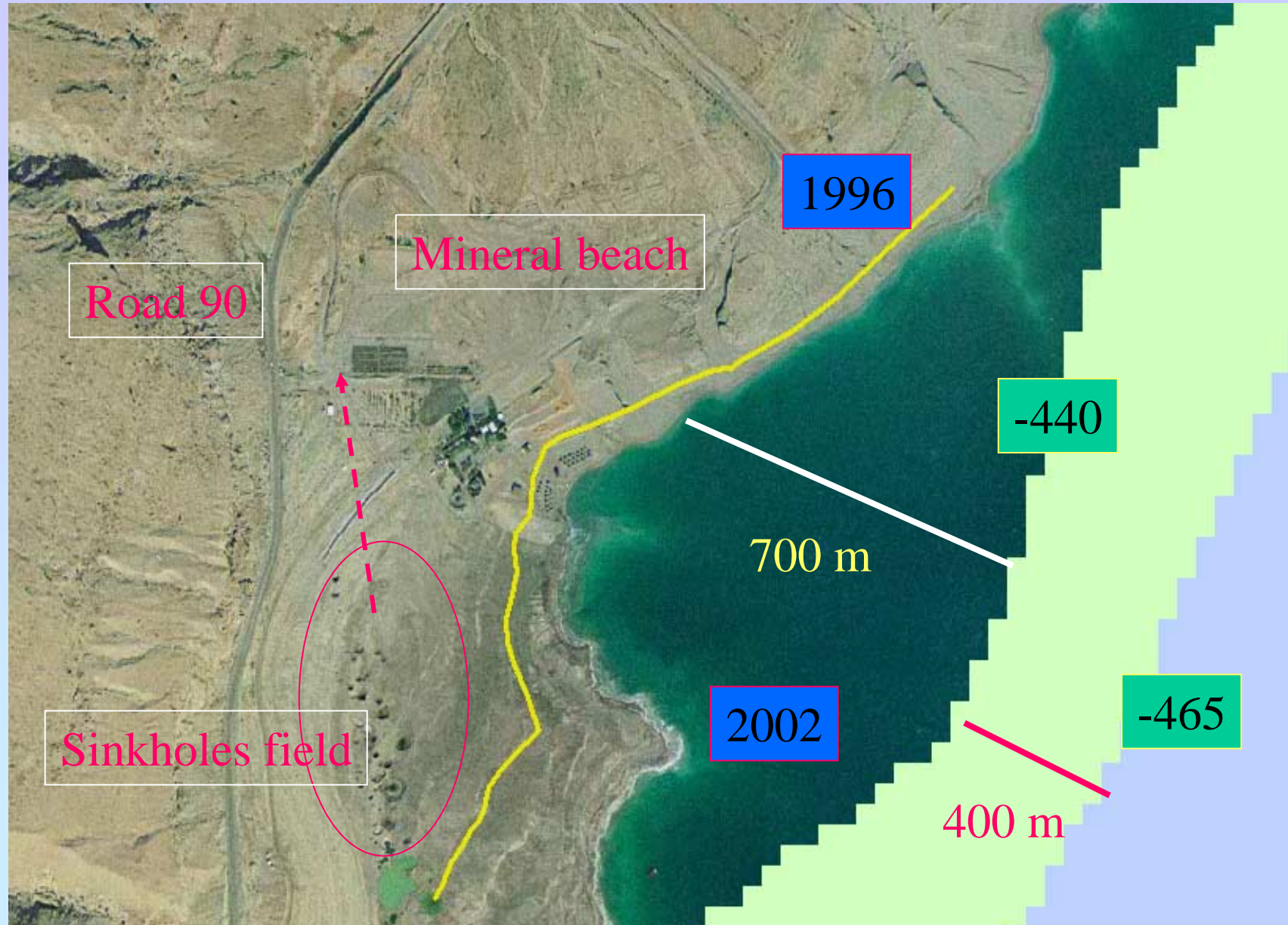
Ein Gedi

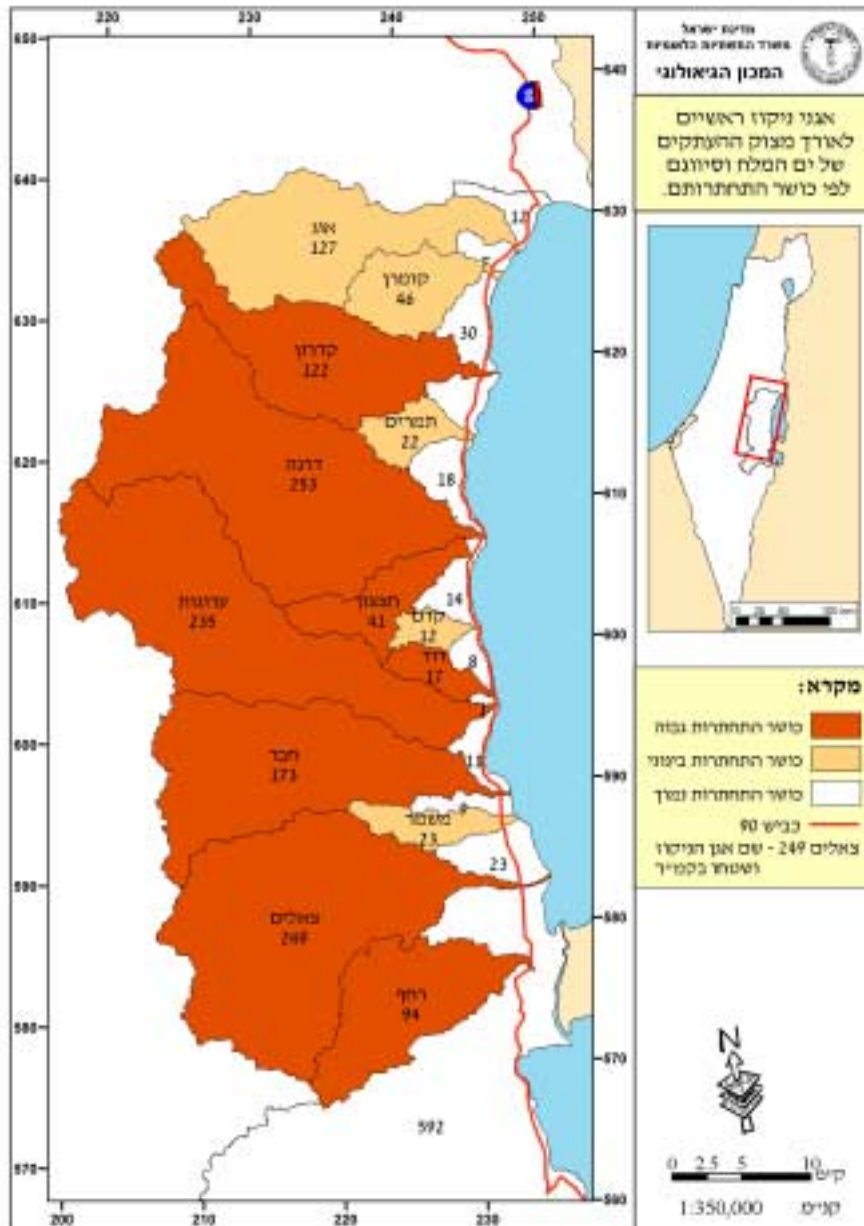
The outlet of Nahal Ze'elim

Bathymetric contours -440 and -465 near Nahal Hever outlet, which are expected to be exposed at 2025 and 2050

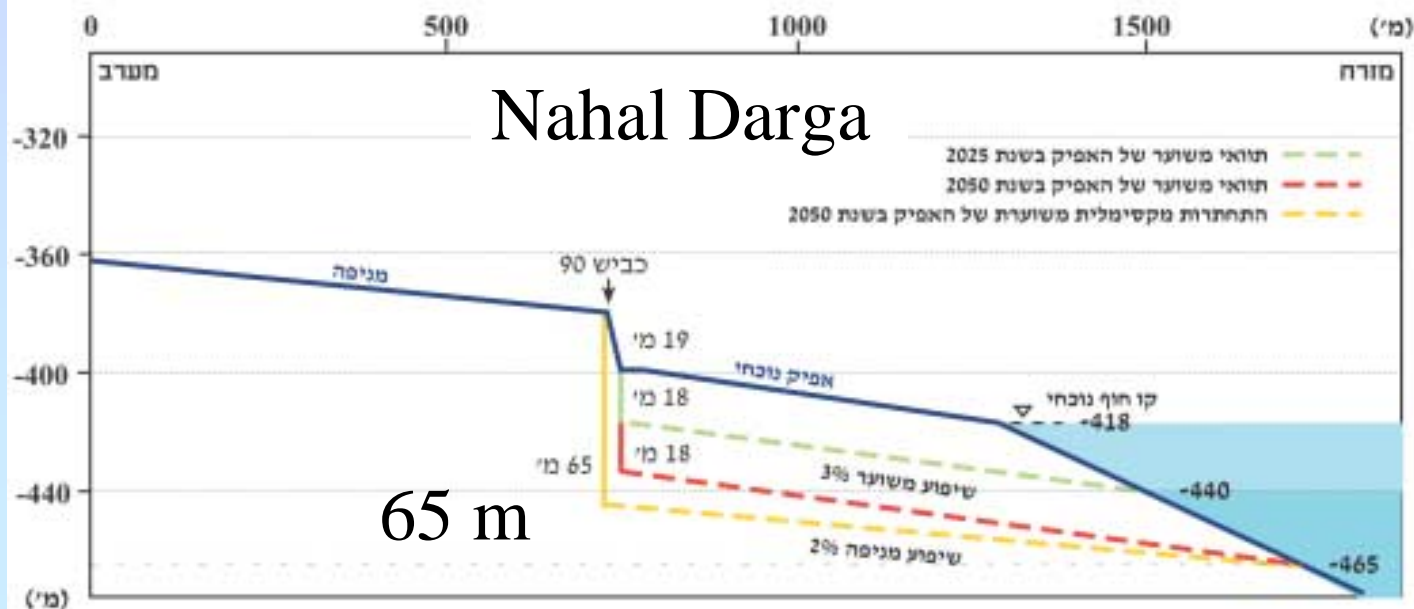
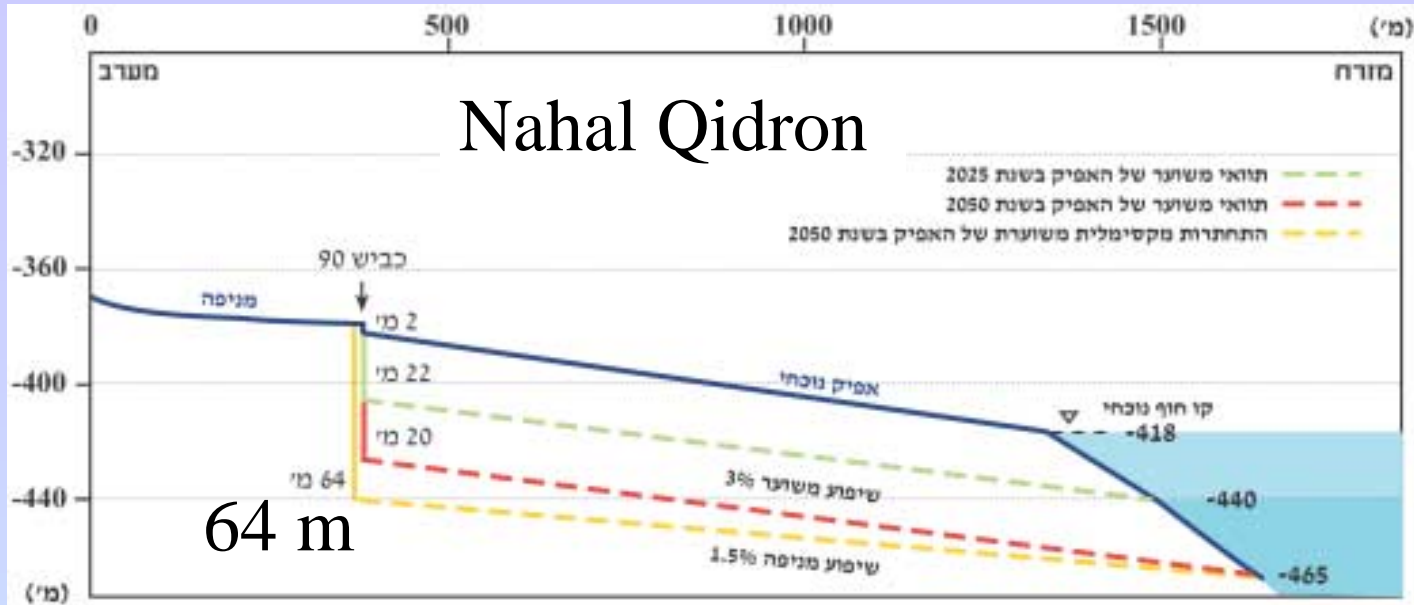


Expected geomorphic development near mineral beach

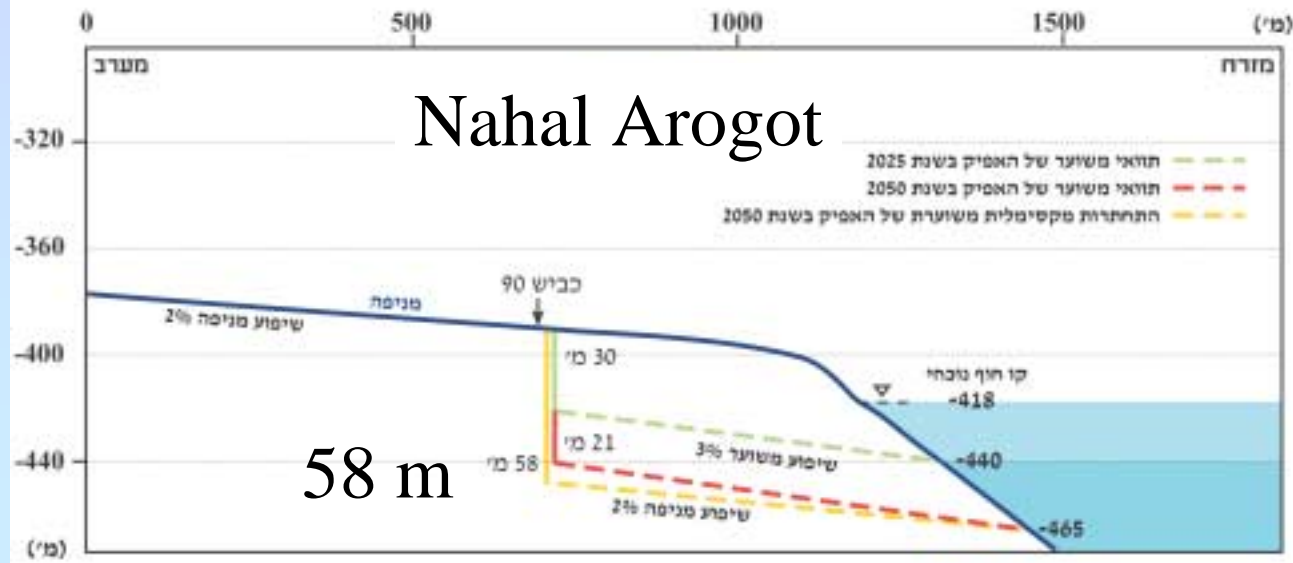
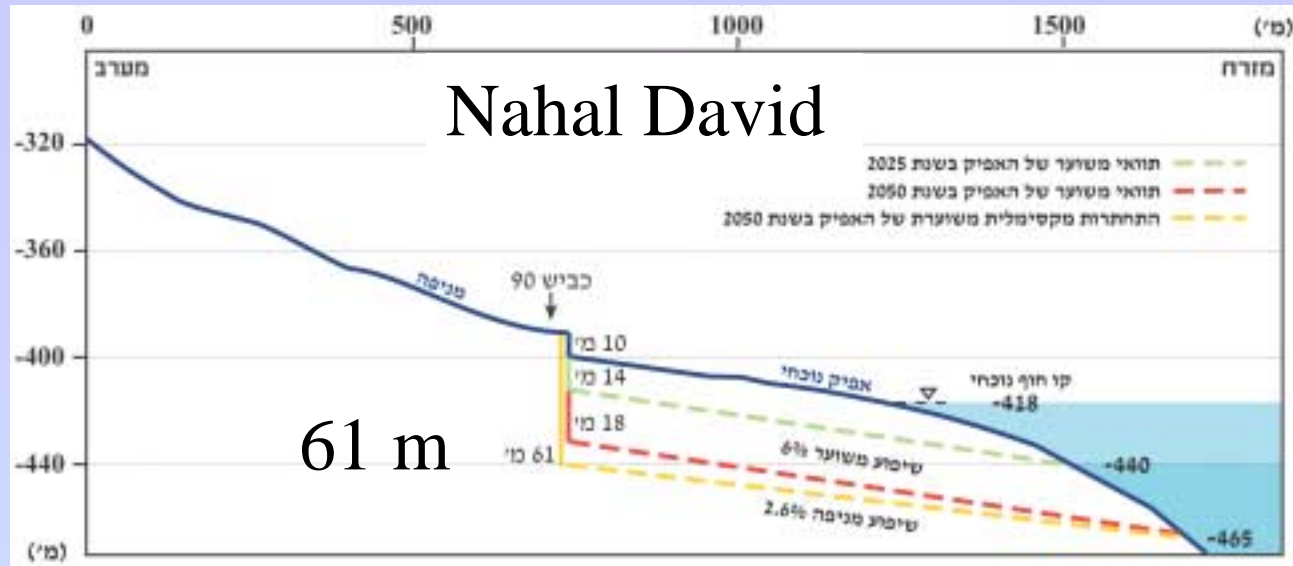


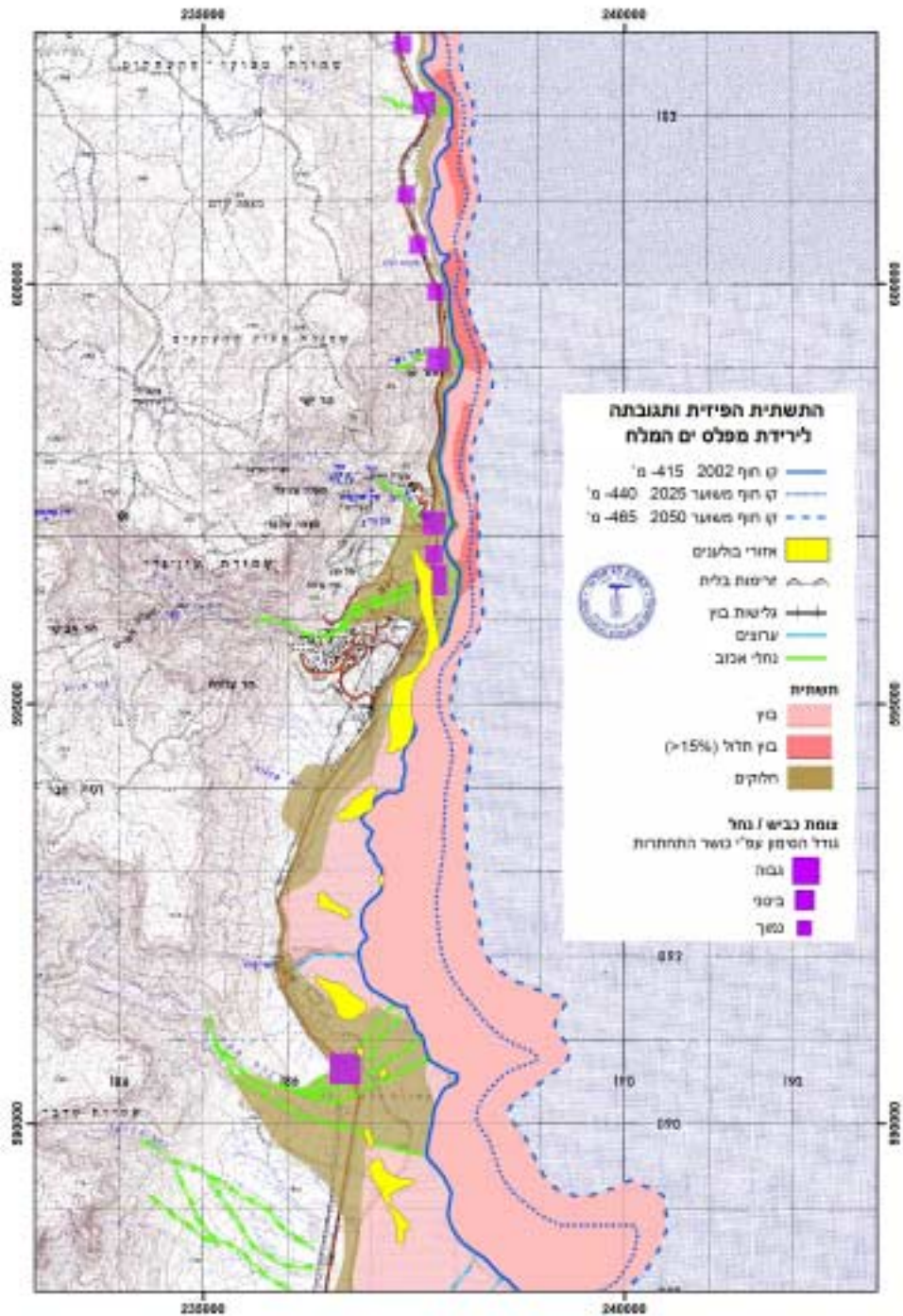


Incision
potential of the
drainage basins
along the Dead
Sea western
coast



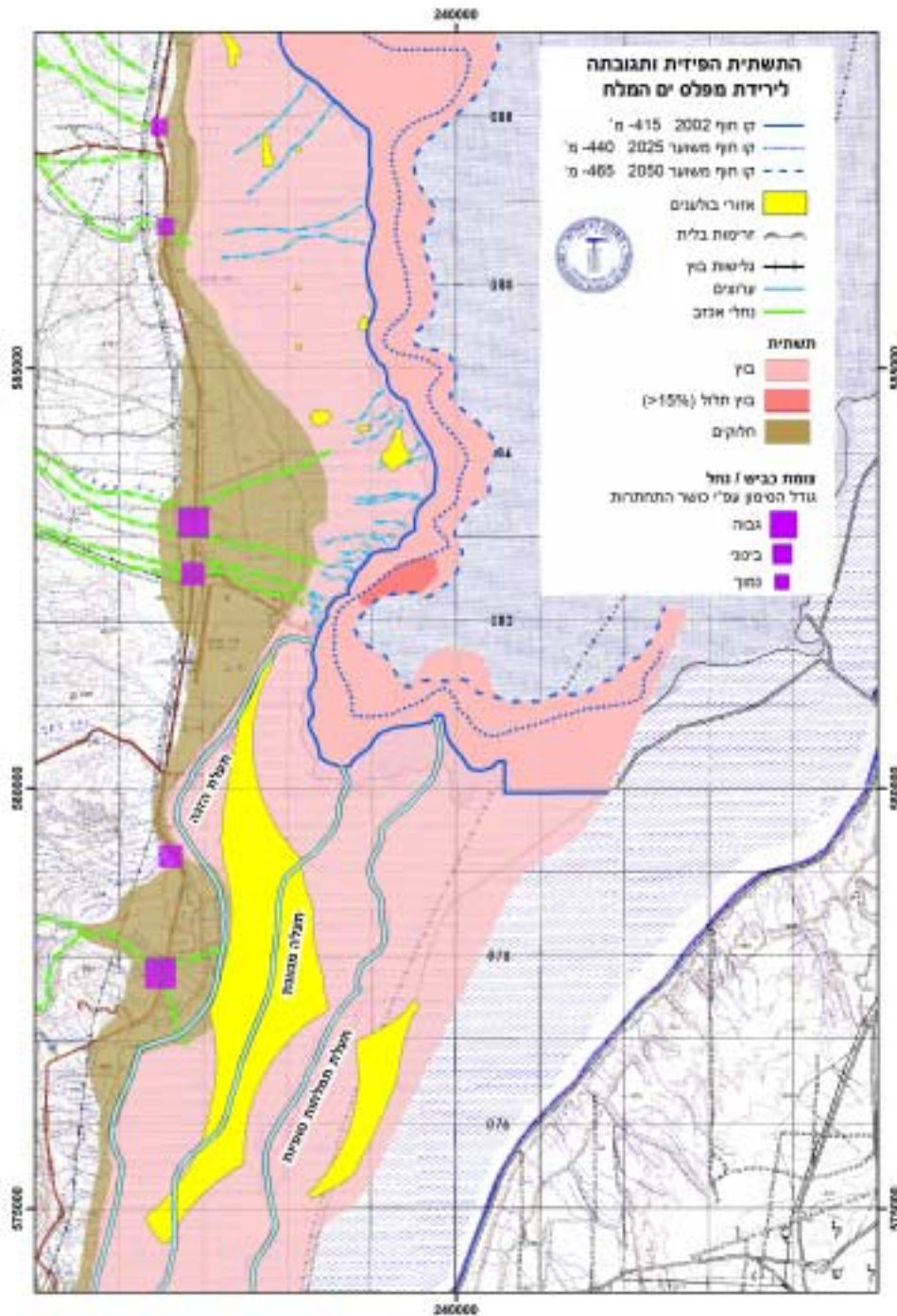
Expected
 incision
 near the
 Dead Sea
 road
 resulted
 from
 channel
 upstream
 migration
 2025-
 2050





Final
geomorphic
map – the
expected
response of the
geomorphic
system to the
future drop in
the Dead Sea
level

Ein Gedi region



Southern basin
and the Lynch
straights

Conclusions – present processes

- The present lake level is 25 m lower than the mid 1960s level.
- During the last 10 years the Dead Sea retreated in 1m/y.
- The main geomorphic processes are:
 1. Exposure of wide mud flats
 2. Recent exposure of steep bathymetric slopes
 3. Rapid increase of areas infected by sinkholes
 4. Intensive incision of channels, causing heavy damage to infrastructures

Conclusions- future forecast

- A dynamic and non linear geomorphic rebound is expected in the coming years along the Dead Sea coast
- The rapid incision of gullies and channels is expected to damage the infrastructures in the region, including the Dead Sea Works pools
- It is necessary to adapt a proper planning strategy for this unique and active region