Dead Sea water level decline and the direct cause of sinkhole's proliferation, subsidence and landslides hazards.

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Sinkholes, subsidence and landslides around the Dead Sea appear in clusters including from one up to hundreds of elements. A significant number of sinkhole clusters and boundaries of wide shallow subsidence display a clear linear shape. Comparison between their trends and the known fault segments generally shows striking similarities, their distribution is predominantly bimodal: showing NE and NW principal directions. During the last five years, by means of geophysical techniques, a relationship had been found between sinkhole alignments and the edge of a specific buried salt layer corresponding to an ancient shoreline. These observations suggest that sinkhole formation could be controlled either by faults concealed within the transform fill, and/or by the landward limit of a particular salt layer.
Up to now, the relative contribution between these two observations is not clear. However, on both sides of the Dead Sea, authors agree with the following elements to explain recent proliferation of geological hazards with an emphasis on sinkholes:
• The presence of a thick salt layer (or layers) at depth ranges of 25 to 50 m and some deeper, and sandwiched between aquiclude layers of clay and silt;
• The identification of cavities within the salt layers in sinkhole sites;
• The presence of undersaturated water with respect to halite in aquifers confined beneath the salt layer;
• The composition of the groundwater in the salt layer that indicates salt dissolution;
• The association between sinkhole sites, land subsidence and landslides;
• The formation of sinkholes along and above buried faults and/or buried salt edge layer(s).
In all, a large number of observations combine to suggest that the primary cause of sinkhole formation is dissolution of the salt layer by undersaturated groundwater. The interface between the Dead Sea brine and this groundwater migrated seaward due to the lake level decline at the average speed of 1 m/year. From a pure “tectonic” model point of view, undersaturated water accessed the salt layer via faults that cut through the soft aquiclude layers. The opening of these conduit-faults is likely due to differential compaction of the aquiclude layers, explaining the correlation between the land subsidence and sinkhole sites.