Supplementary

"The origin and nature of the rapid Late Tertiary filling of the Levant basin"

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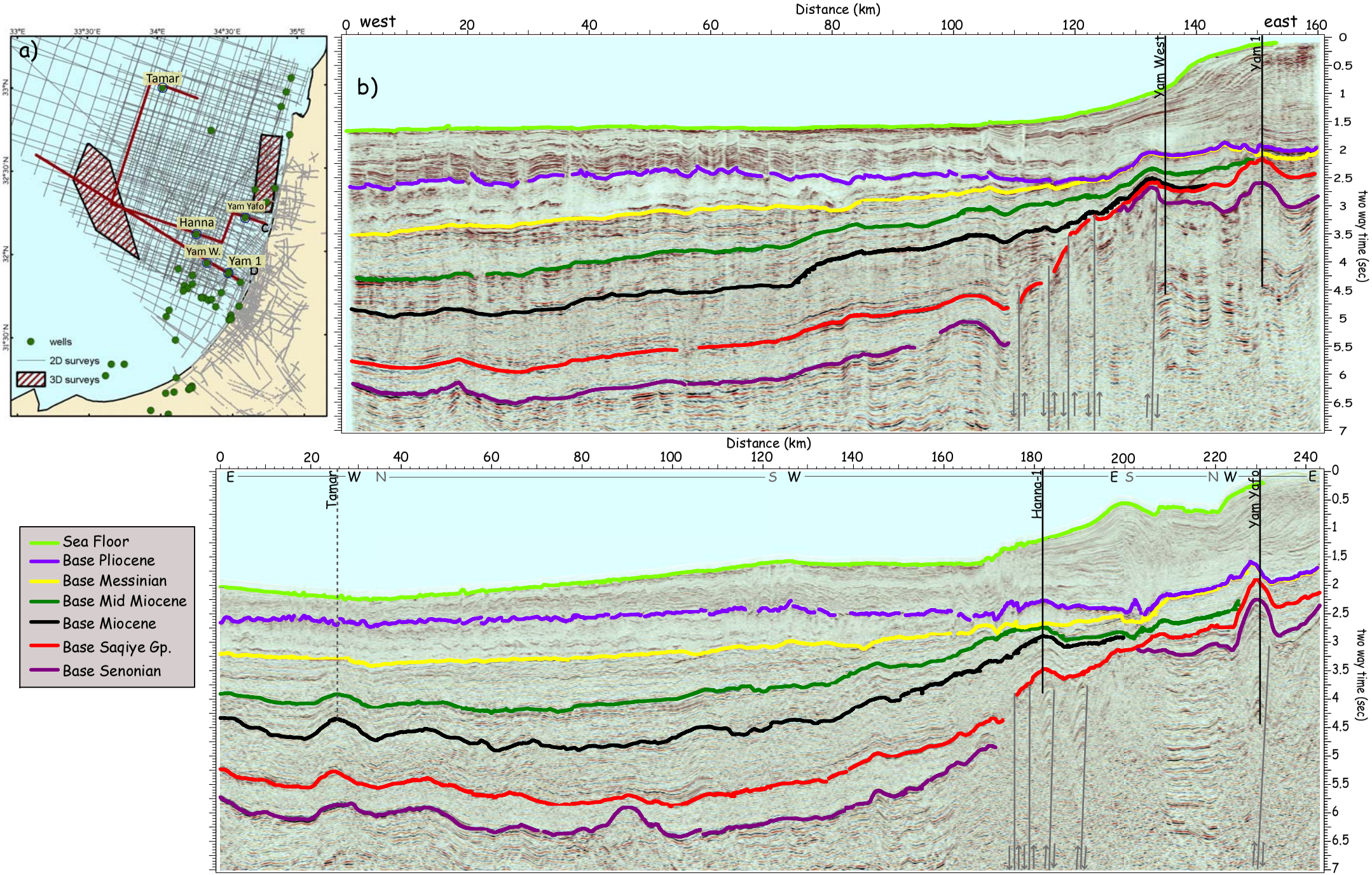
Correlation of seismic reflectors between the Israeli continental shelf and the deep Levant basin.

Chronostratigraphic interpretation of seismic reflectors along the Israeli continental shelf is well established and calibrated by numerous wells drilled during several decays of exploration (supplementary figure DR1a). However, extending this interpretation westward towards the deep Levant basin was uncertain until recently, because of the difficulty to continuously follow sub-Messinian seismic reflectors across the Continental Margin Fault Zone (CMFZ). Garfunkel (1988; Tectonophysics) was one of the first to propose a thick Tertiary section in the Levant Basin based on seismic velocities. However, due to poor seismics and the lack of detailed well data at that time, Garfunkel (1988) couldn't follow the base Saqiye Gp. horizon (red horizon in Fig. 2, representing the base Late Eocene unconformity) into the basin and thus generalized the Paleocene to Recent section as one unit characterized by relatively low seismic velocities. A significant breakthrough was achieved in the early 2000's when the Hanna 1 well was drilled in a canyon at the foots of the CMFZ step. The detailed biostratigraphy of this well allowed for the reliable extension of seismic horizons towards the deep basin (supp. fig. DR1b, c). Following these findings, Gardosh et al. (2008) and Gvirtzman et al. (2008) published seismic sections and maps subdividing the Tertiary section and suggesting that only its younger part (post Mid Eocene) is exceptionally thick. However, extrapolation of seismic horizons outside of the Hanna canyon was still somewhat speculative until recently when the Tamar well (Fig. 1) was drilled some 90km offshore Israel far within the deep basin. Supplementary figure 1c portrays a composite arbitrary line that connects the continental margin with the recently drilled Tamar well via the Hanna canyon. Although this well still did not penetrate the base Saqiye Gp (red horizon) it confirmed the age of the seismic units mapped by Gardosh et al. (2008) and Gvirtzman et al. (2008) at least down to the Early Miocene (black horizon in supp. fig. 1) and provided for the in-depth depositional system analysis that is presented in this paper.



Supplementary figure 1. a) regional extent of the seismic dataset used here along with location of seismic sections (b,c) and the offshore wells used for correlationof seismic reflectors. b) seismic section that crosses the CMFZ step and shows the stratigraphic architecture of the deep Levant Basin. Note the thickness of the Oligo-Miocene section in the deep basin relative to the eastern intermediate block. c) arbitrary seismic section showing the correlation of the seismic reflectors of the continental margin and those of the deep basin. The velocity function of the recently drilled Tamar well is assumed from the stacking velocities of the regional surveys as described in the text.