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Vertical tectonic movements at the SW corner of the Sea of Marmara; new seismic chirp reflection data from Erdek Bay (Turkey)

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Erdek Bay is located at the SW corner of the Sea of Marmara, separated from the Bandırma and Gemlik depressions by a triangular and dome-like shape peninsula which is connected to the mainland by two coastal spits. The bay also divides two main dextral strike-slip strands of the North Anatolian fault system. The moment tensor solutions of the earthquakes to the north of the Marmara Islands, which are scattered at the northern margin of the Erdek Bay, indicate normal faulting with oblique components, contrary to those of the main strike-slip faults. The relative rise in sea-level at the Erdek permanent tide gauge station, located at the southern margin of the Kapidag Peninsula, is high. This may indicate a land subsidence which may be local or regional. The findings on recent crustal deformation (thinning) and strain accumulation in the Sea of Marmara region, however, are not sufficient to represent the vertical movements in detail. The suspended valleys and marine terraces of the Kapidag Peninsula imply that a tectonic uplift is evident at least along the northern coasts. Considering that the subsidence at the sea-level station is not a local event then the Kapidag Peninsula should be tilting southward. In 2010 summer, the signatures of these tectonic evolutions were sought in the Erdek Bay using new Chirp seismic data. Some deformed structures and unknown faults severely affecting the seismic stratigraphic units were detected and considered in the explanation of vertical tectonic movements in the region.