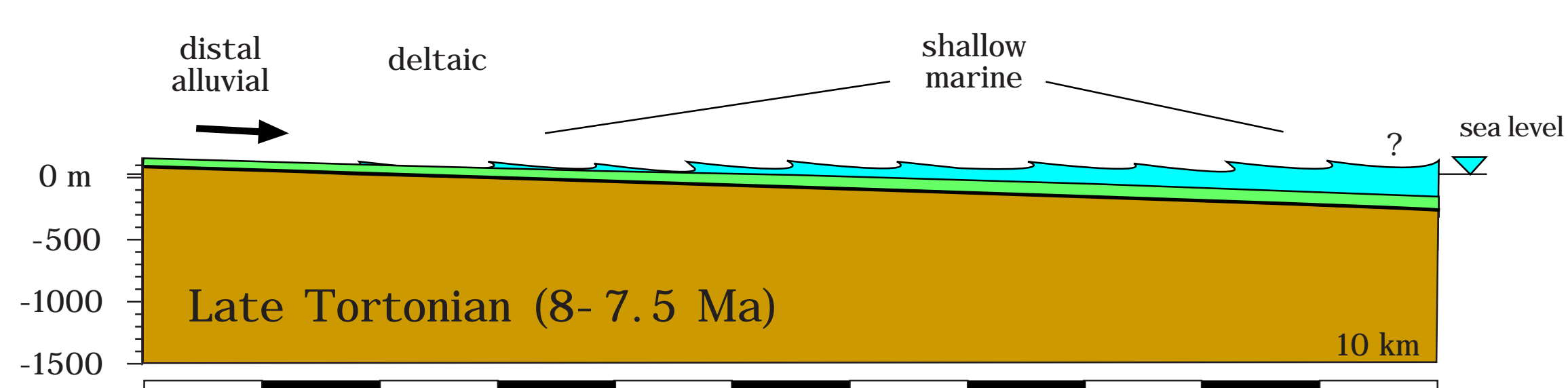
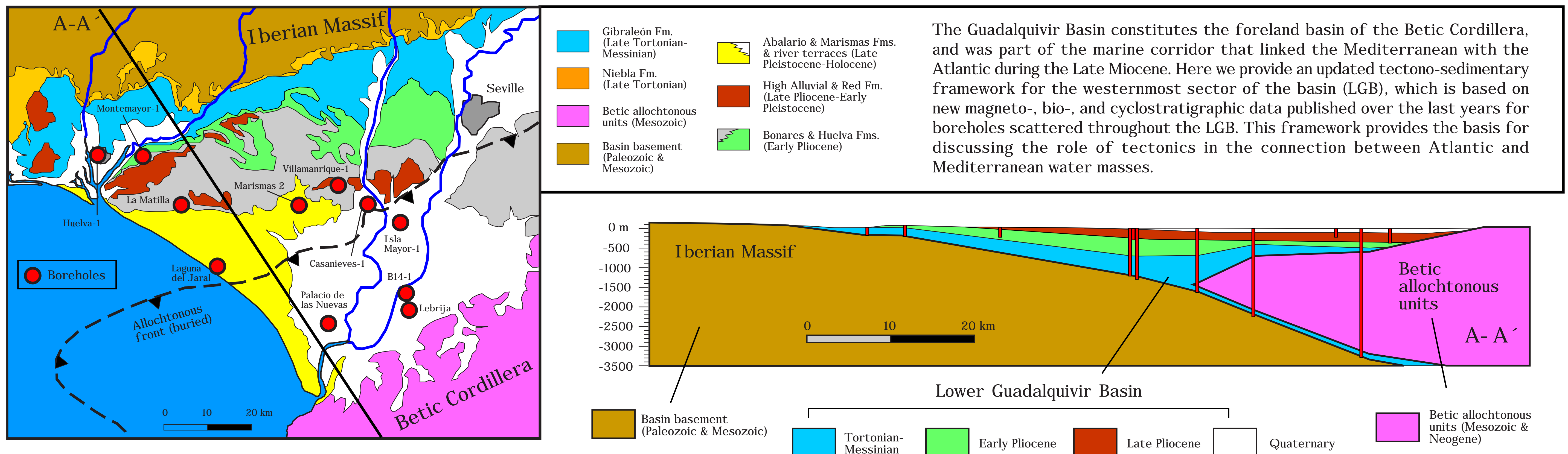


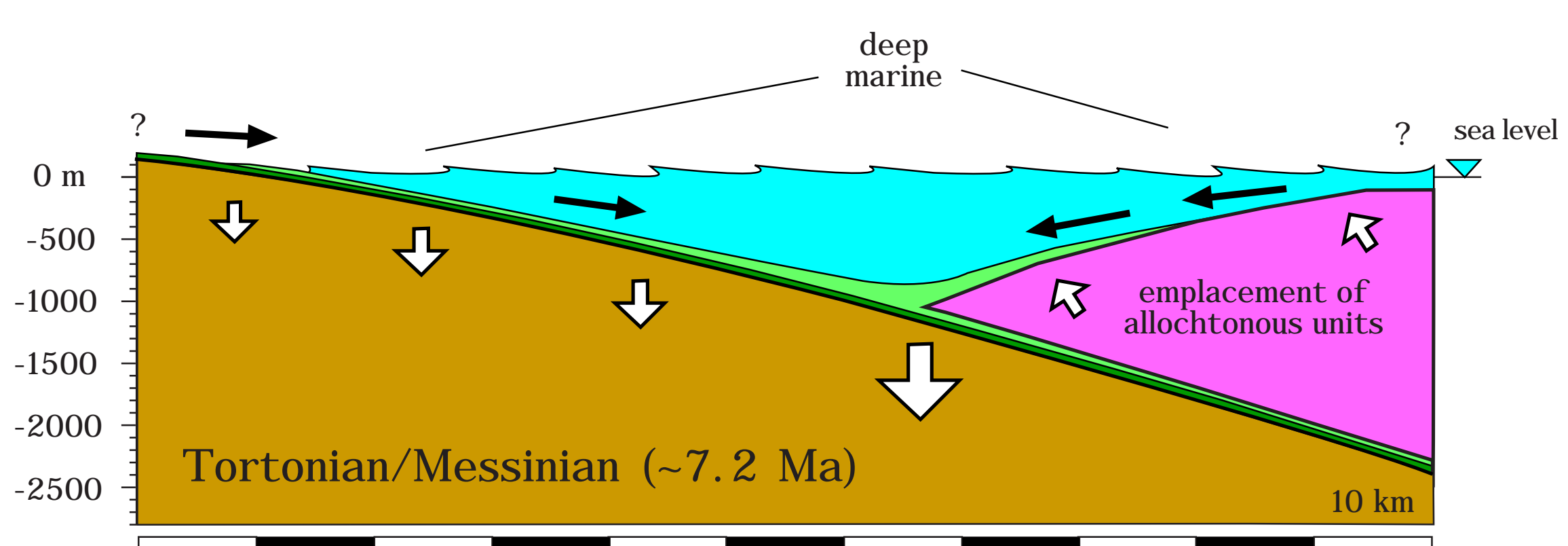
# An updated chronostratigraphic framework for the lower Guadalquivir Basin; tectono-sedimentary implications

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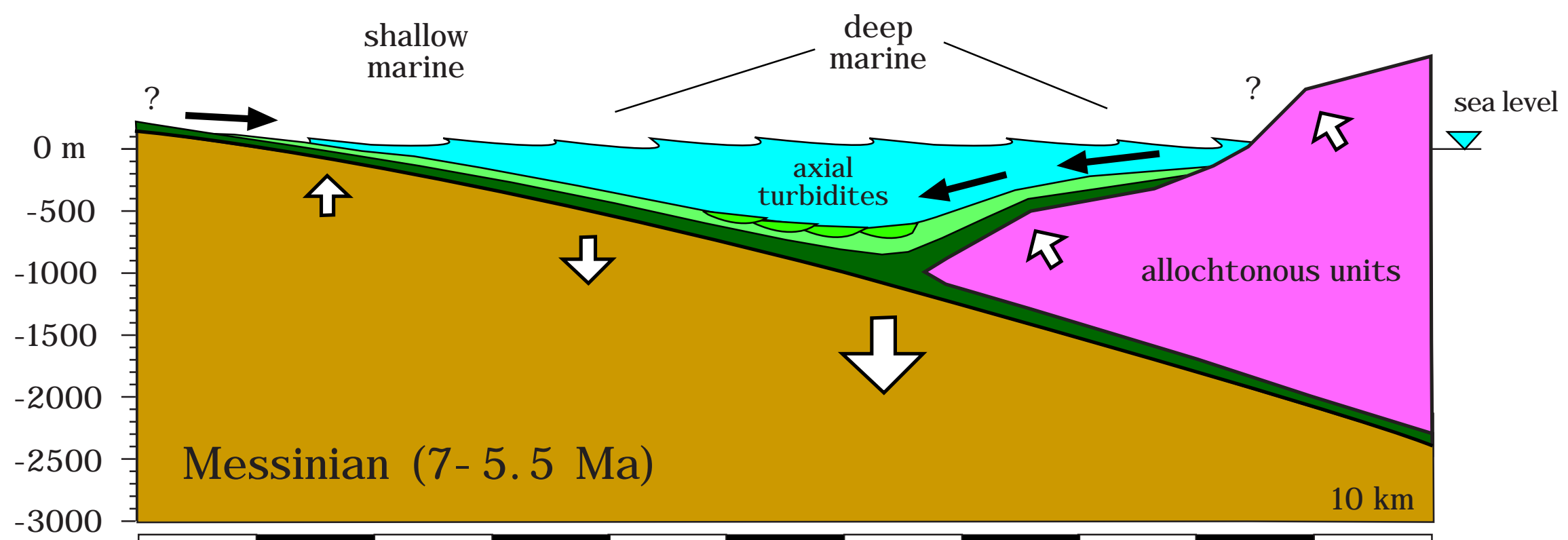
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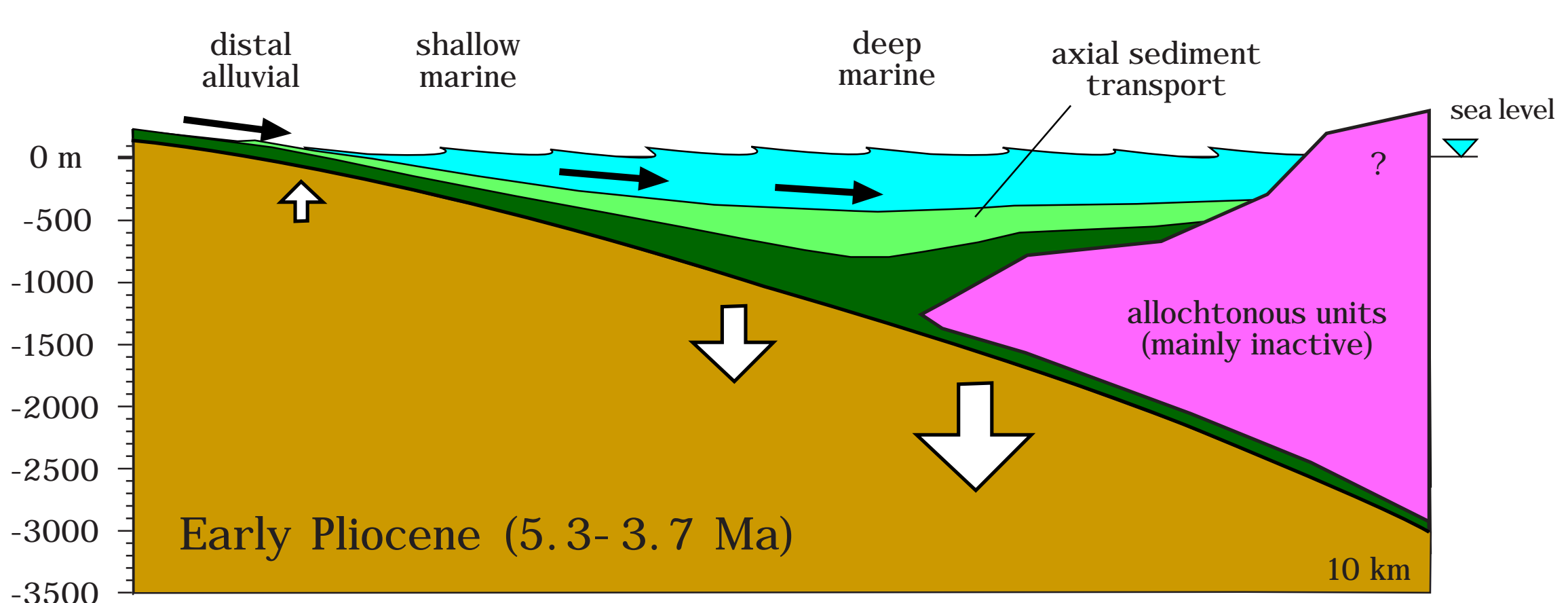
Sedimentation begins with continental and shallow marine conditions prevailing in the northern and central/southern sectors of the LGB, respectively.



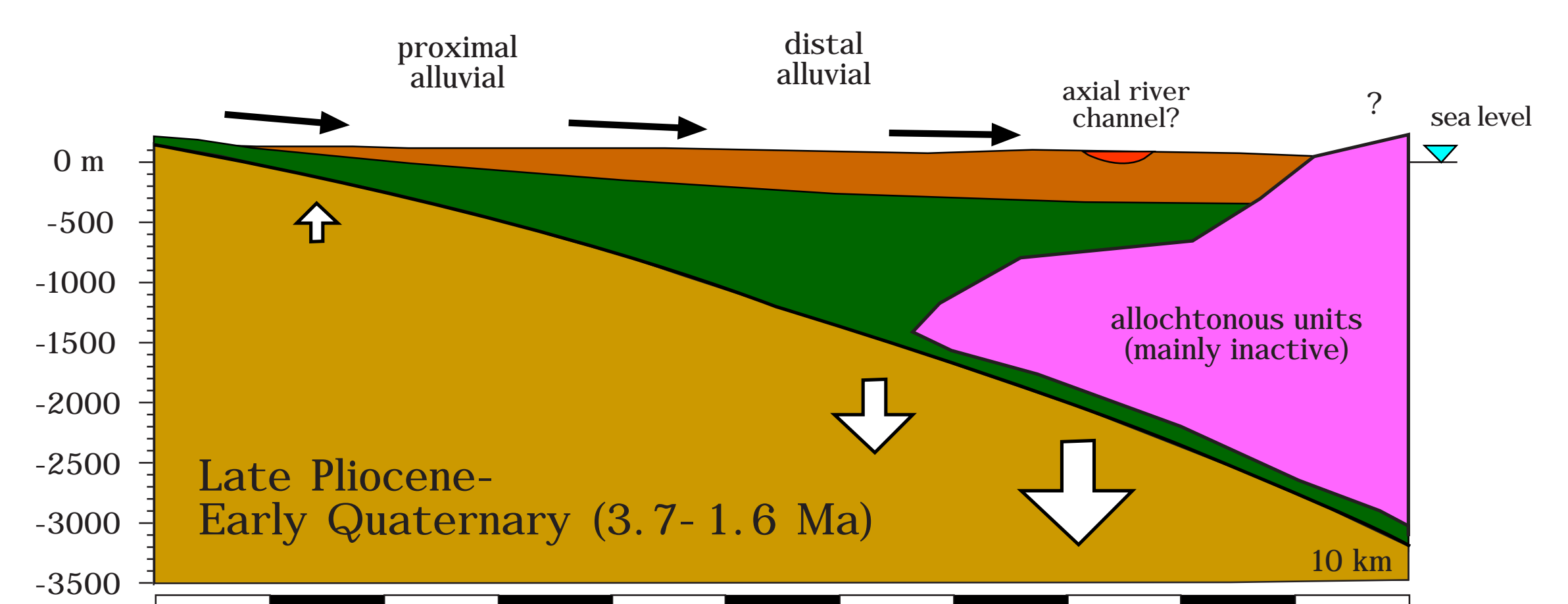
The so-called allochthonous units are emplaced in a deeper marine setting caused by thrust stacking in the External Betics and a concomitant period of basin subsidence.



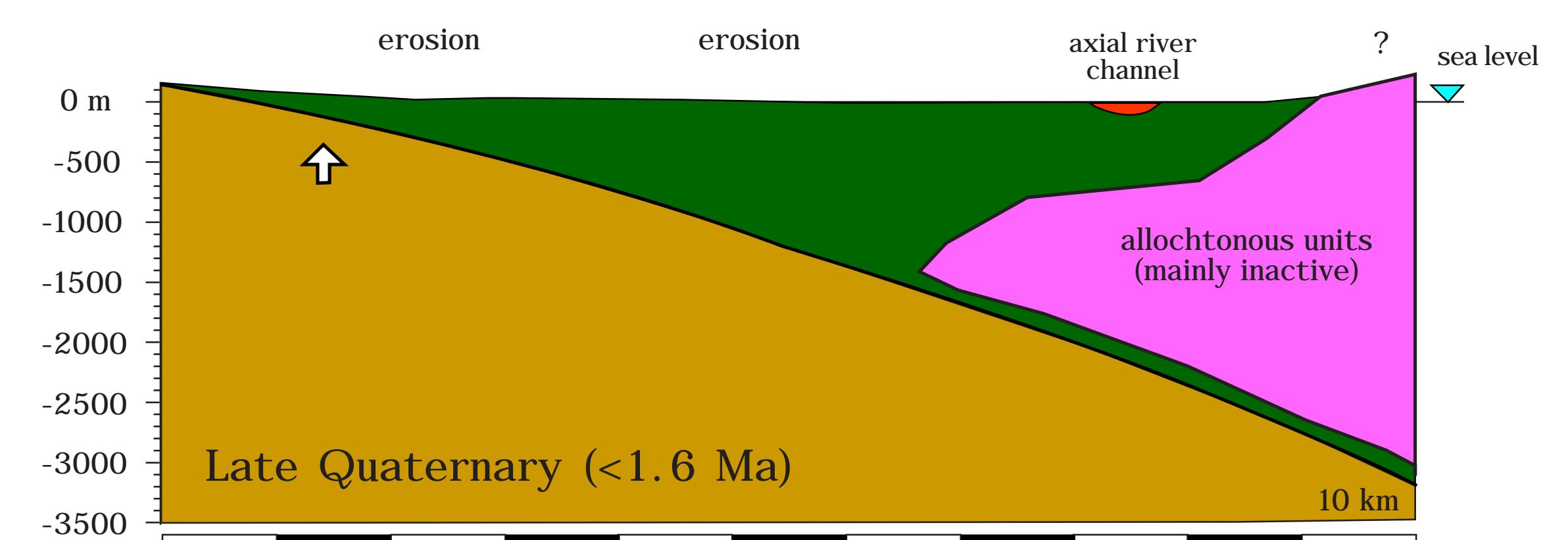
Thrust activity in the External Betics leads to uplift of the allochthonous units, to a dominant southerly sediment provenance, to the northward migration of axial turbidite channels, and to uplift of the passive margin.



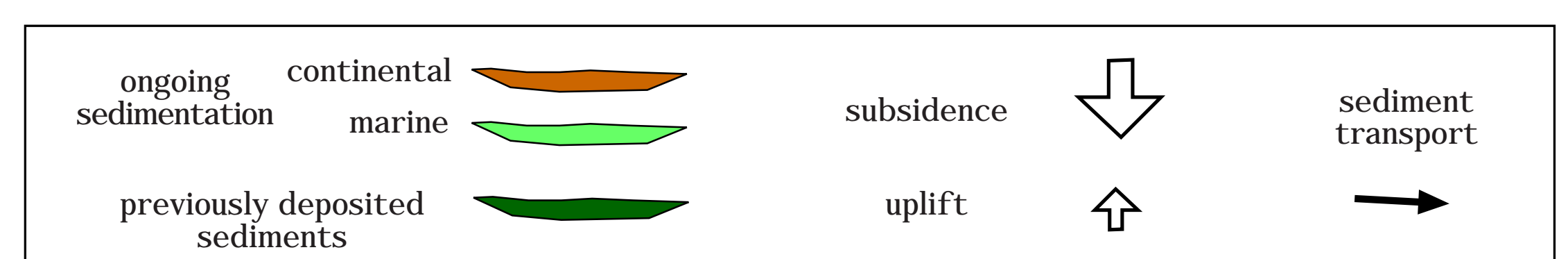
The southern part of the LGB experiences a significant subsidence and marine sediments downlap progressively towards the south. The then-uplifting passive margin provides most of the sediment supply, which is then exported axially.



The area of highest subsidence keeps shifting to the south but sedimentation now continues in continental conditions due to filling of the basin. Sediment supply comes mainly from the the uplifting passive margin and is then deflected axially.



After 1.6 Ma, basin subsidence eventually ends, fluvial erosion prevails, and the sedimentary record appears to be restricted to shallow marine sediments accumulated probably during the most recent sea-level lowstand-highstand cycles.



## Discussion: implications for the Atlantic/Mediterranean connection

1) Continued tectonic activity in the External Betics during the Late Tortonian and Messinian might provide the steady uplift required to close the Betic Corridor while keeping the shallow connection of the Mediterranean with the Atlantic that is needed to precipitate the "Salt Giant" during the Messinian Salinity Crisis.

2) The southward-migrating subsidence of the LGM from the Miocene/Pliocene boundary onwards is at odds with tectonic activity in the External Betics, but is consistent with the pull of a sinking lithospheric slab below the Betics. The westward-propagating lateral tear of this slab might have accelerated subsidence in the LGB and neighbouring regions around the Miocene/Pliocene boundary, contributing to the reestablishment of the Mediterranean/Atlantic connection.

3) Periods of sediment accumulation, bypass, depocentre migration, and basin-margin uplift in the LGB might have had an impact on the type and volume of sediments exported to the Atlantic Ocean, thereby conditioning the redistribution of sediments by the Mediterranean Outflow Water in the Gulf of Cadiz.