

## Deep controls on Foreland Basin System evolution along the Sicily Thrust Belt

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The palinspastic restoration of the Sicilian crustal geological cross section (Catalano et al., 2013) points out two subsequent main thrust (MT1 and MT2) active during the Neogene tectonic evolution as well as the decrease of slip and shortening rate estimated for MT2 with respect to MT1 early main thrust. During orogenic building, syn-tectonic deposits are accumulated inside wedge-top-basin that grow on top of thrust sheets. Sedimentary and stratigraphic features of wedge-top basin change through time following fold and thrust belt evolution. Neogene-Quaternary syn-tectonic successions (terrigenous, evaporitic, hemipelagic and shallow water deposits) extensively crop-out, in more or less wide wedge-top-basins, above the Sicilian Fold and Thrust Belt (Gugliotta et al., 2014 with references therein).

These deposits can be grouped in three main sedimentary successions characterized by basal unconformity surface on deformed substrate (thrust wedge) that, also, represent the depositional interface of coeval wedge-top and foredeep basins: i) middle-late Miocene terrigenous, deep-water succession, accommodated on top of accreted Numidian Flysch nappes; ii) late Miocene deepening upwards succession unconformably covering the inner sector of the FTB constituted by thrusting of Meso-Cenozoic deep-water succession (Sicilide, Imerese and Sicanian Units); iii) Upper Pliocene – Quaternary shallow water succession unconformably covering (in the outer sector of the FTB) a tectonic pile (Gela Thrust System) made by thrusting of the former syn-tectonic succession. Tectono-sedimentary evolution of these basin was controlled by the deepening of the structural levels that were active during fold and thrust belt growth. A crucial change was recorded by the wedge-top depozone during late Pliocene-Pleistocene, when a deeper thrust plain (MT2), cut and thickened the crystalline basement (in the inner sector of the FTB), evolving the thrusting model from thin to thick skinned. As consequence of the involvement of the basement in the Sicilian FTB, and of increased orogenic deep load, the foreland basin system recorded a narrowing of the foredeep:

- during late Tortonian – early Pliocene, regional lithofacies distribution accounts for a wide foredeep that included the present day Iblean Plateau and its offshore;

- following the involvement of the basement and consequent increased orogenic load, the foredeep narrowed up to present day wideness, confined between the deformed outermost units of the GTS, to the NW, and the outcrop of the carbonate successions of the Iblean foreland, to the SE.

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