**SUPPLEMENTS**

SM1: Subsidence analyses in the Aquitaine Basin, modified from Brunet (1984). Top: individual tectonic subsidence curves, with error bars (standard deviation). Middle: total stretching factor (β) (isostatic calculation, Watts, 2001) calculated from each tectonic subsidence. Bottom: incremental stretching factor (β) with a 10 Myr time step.

SM2: Subsidence analyses in the Betics basin, modified from Hanne et al., (2003). Top: individual tectonic subsidence curves, with error bars (standard deviation). Middle: total stretching factor (β) (isostatic calculation, Watts, 2001) calculated from each tectonic subsidence. Bottom: incremental stretching factor (β) with a 10 Myr time step.

SM3: Subsidence analyses in the Cameros Basin, modified from Salas & Casas (1993), Salas et al. (2001) and Omodeo-Sale et al. (2017). Top: individual tectonic subsidence curves, with error bars (standard deviation). Middle: total stretching factor (β) (isostatic calculation, Watts, 2001) calculated from each tectonic subsidence. Bottom: incremental stretching factor (β) with a 10 Myr time step.

SM4: Subsidence analyses in the Maestrat Basin, modified from Salas & Casas (1993) and Salas et al. (2001). Top: individual tectonic subsidence curves, with error bars (standard deviation). Middle: total stretching factor (β) (isostatic calculation, Watts, 2001) calculated from each tectonic subsidence. Bottom: incremental stretching factor (β) with a 10 Myr time step.

SM5: Subsidence analyses in the West Iberia, modified from Spooner et al. (2018). Top: individual tectonic subsidence curves, with error bars (standard deviation). Middle: total stretching factor (β) (isostatic calculation, Watts, 2001) calculated from each tectonic subsidence. Bottom: incremental stretching factor (β) with a 10 Myr time step.

SM6: GPlates data presented in this study.

SM7: Animated reconstruction (.mpeg file).