



# Extensional salt tectonics in the Cotiella post-rift basin (south-central Pyrenees): 3D structure and evolution

Berta López Mir

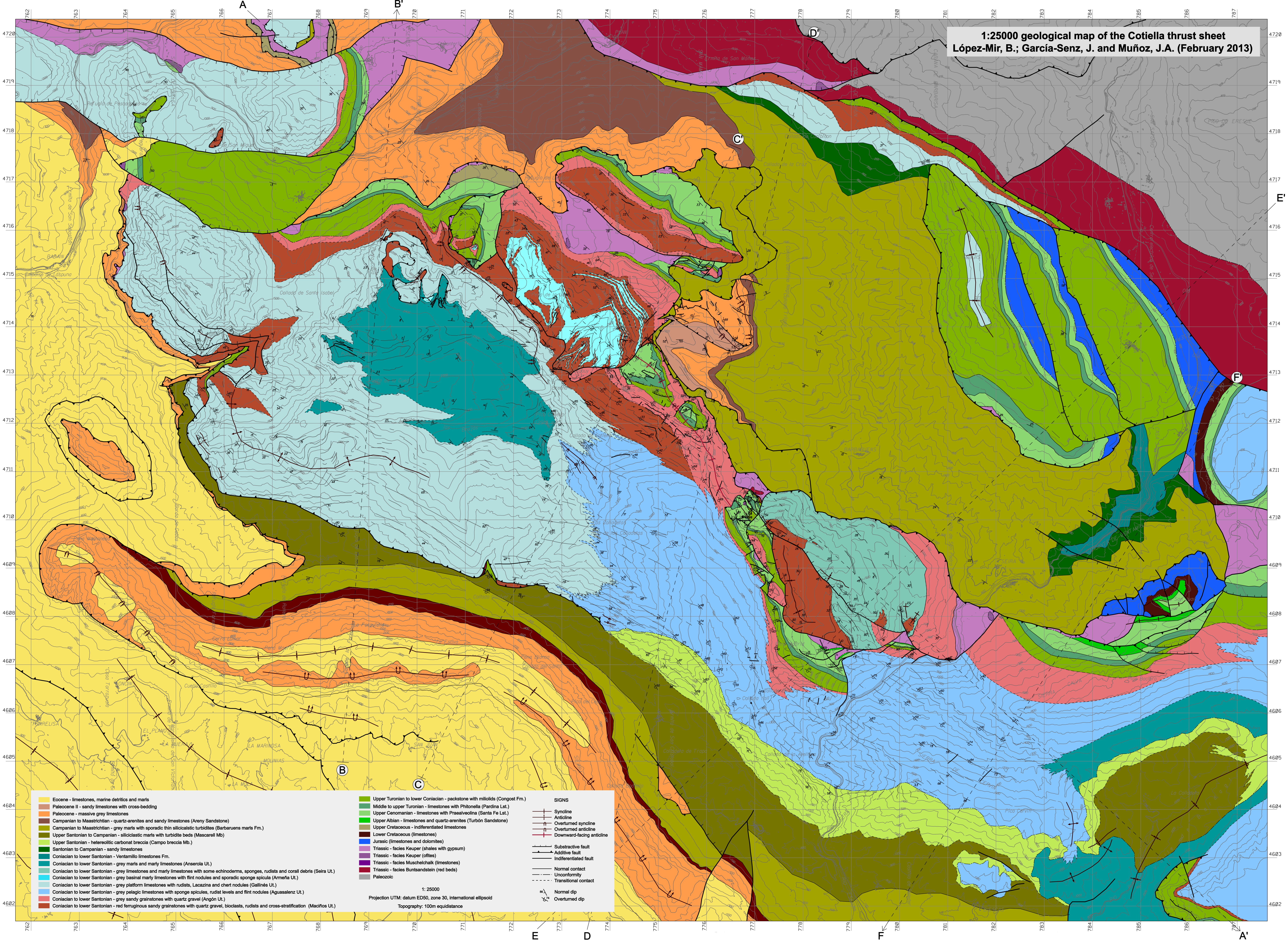
**ADVERTIMENT.** La consulta d'aquesta tesi queda condicionada a l'acceptació de les següents condicions d'ús: La difusió d'aquesta tesi per mitjà del servei TDX ([www.tdx.cat](http://www.tdx.cat)) i a través del Dipòsit Digital de la UB ([diposit.ub.edu](http://diposit.ub.edu)) ha estat autoritzada pels titulars dels drets de propietat intel·lectual únicament per a usos privats emmarcats en activitats d'investigació i docència. No s'autoritza la seva reproducció amb finalitats de lucre ni la seva difusió i posada a disposició des d'un lloc aliè al servei TDX ni al Dipòsit Digital de la UB. No s'autoritza la presentació del seu contingut en una finestra o marc aliè a TDX o al Dipòsit Digital de la UB (framing). Aquesta reserva de drets afecta tant al resum de presentació de la tesi com als seus continguts. En la utilització o cita de parts de la tesi és obligat indicar el nom de la persona autora.

**ADVERTENCIA.** La consulta de esta tesis queda condicionada a la aceptación de las siguientes condiciones de uso: La difusión de esta tesis por medio del servicio TDR ([www.tdx.cat](http://www.tdx.cat)) y a través del Repositorio Digital de la UB ([diposit.ub.edu](http://diposit.ub.edu)) ha sido autorizada por los titulares de los derechos de propiedad intelectual únicamente para usos privados enmarcados en actividades de investigación y docencia. No se autoriza su reproducción con finalidades de lucro ni su difusión y puesta a disposición desde un sitio ajeno al servicio TDR o al Repositorio Digital de la UB. No se autoriza la presentación de su contenido en una ventana o marco ajeno a TDR o al Repositorio Digital de la UB (framing). Esta reserva de derechos afecta tanto al resumen de presentación de la tesis como a sus contenidos. En la utilización o cita de partes de la tesis es obligado indicar el nombre de la persona autora.

**WARNING.** On having consulted this thesis you're accepting the following use conditions: Spreading this thesis by the TDX ([www.tdx.cat](http://www.tdx.cat)) service and by the UB Digital Repository ([diposit.ub.edu](http://diposit.ub.edu)) has been authorized by the titular of the intellectual property rights only for private uses placed in investigation and teaching activities. Reproduction with lucrative aims is not authorized nor its spreading and availability from a site foreign to the TDX service or to the UB Digital Repository. Introducing its content in a window or frame foreign to the TDX service or to the UB Digital Repository is not authorized (framing). Those rights affect to the presentation summary of the thesis as well as to its contents. In the using or citation of parts of the thesis it's obliged to indicate the name of the author.



1:25000 geological map of the Cotiella thrust sheet  
 López-Mir, B.; García-Senz, J. and Muñoz, J.A. (February 2013)



<ul style="list-style-type: none"> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #f9c94b; border: 1px solid black; margin-right: 5px;"></span> Eocene - limestones, marine detritics and marls</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #e67e22; border: 1px solid black; margin-right: 5px;"></span> Paleocene II - sandy limestones with cross-bedding</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #c9583c; border: 1px solid black; margin-right: 5px;"></span> Paleocene - massive grey limestones</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #a6603d; border: 1px solid black; margin-right: 5px;"></span> Campanian to Maastrichtian - quartz-arenites and sandy limestones (Areny Sandstone)</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #8d6e63; border: 1px solid black; margin-right: 5px;"></span> Campanian to Maastrichtian - grey marls with sporadic thin siliciclastic turbidites (Barbaruens marls Fm.)</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #7d6c63; border: 1px solid black; margin-right: 5px;"></span> Upper Santonian to Campanian - siliciclastic marls with turbidite beds (Mascarell Mb.)</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #6d6c63; border: 1px solid black; margin-right: 5px;"></span> Upper Santonian - heteroellitic carbonat breccia (Campo breccia Mb.)</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #5d6c63; border: 1px solid black; margin-right: 5px;"></span> Santonian to Campanian - sandy limestones</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #4d6c63; border: 1px solid black; margin-right: 5px;"></span> Coniacian to lower Santonian - Ventamillo limestones Fm.</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #3d6c63; border: 1px solid black; margin-right: 5px;"></span> Coniacian to lower Santonian - grey marls and marly limestones (Anserola Ul.)</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #2d6c63; border: 1px solid black; margin-right: 5px;"></span> Coniacian to lower Santonian - grey limestones and marly limestones with some echinoderms, sponges, rudists and corall debris (Saira Ul.)</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #1d6c63; border: 1px solid black; margin-right: 5px;"></span> Coniacian to lower Santonian - grey basinal marly limestones with flint nodules and sporadic sponge spicula (Armeña Ul.)</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #0d6c63; border: 1px solid black; margin-right: 5px;"></span> Coniacian to lower Santonian - grey platform limestones with rudists, Lacazina and chert nodules (Gallinés Ul.)</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #006c63; border: 1px solid black; margin-right: 5px;"></span> Coniacian to lower Santonian - grey pelagic limestones with sponge spicules, rudist levels and flint nodules (Aguasalenz Ul.)</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #005d63; border: 1px solid black; margin-right: 5px;"></span> Coniacian to lower Santonian - grey sandy grainstones with quartz gravel (Angón Ul.)</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #004d63; border: 1px solid black; margin-right: 5px;"></span> Coniacian to lower Santonian - red ferruginous sandy grainstones with quartz gravel, bioclasts, rudists and cross-stratification (Macifos Ul.)</li> </ul>	<ul style="list-style-type: none"> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #90ee90; border: 1px solid black; margin-right: 5px;"></span> Upper Turonian to lower Coniacian - packstone with millifolds (Congost Fm.)</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #76e0b3; border: 1px solid black; margin-right: 5px;"></span> Middle to upper Turonian - limestones with Ptilonella (Pardina Lst.)</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #5bc0de; border: 1px solid black; margin-right: 5px;"></span> Upper Cenomanian - limestones with Praesalweenia (Santa Fe Lst.)</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #4db6ac; border: 1px solid black; margin-right: 5px;"></span> Upper Albian - limestones and quartz-arenites (Turbón Sandstone)</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #39a697; border: 1px solid black; margin-right: 5px;"></span> Upper Cretaceous - indifferntiated limestones</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #2e8b57; border: 1px solid black; margin-right: 5px;"></span> Lower Cretaceous (limestones)</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #1e8449; border: 1px solid black; margin-right: 5px;"></span> Jurassic (limestones and dolomites)</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #008000; border: 1px solid black; margin-right: 5px;"></span> Triassic - facies Keuper (shales with gypsum)</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #006400; border: 1px solid black; margin-right: 5px;"></span> Triassic - facies Keuper (limestones)</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #004d00; border: 1px solid black; margin-right: 5px;"></span> Triassic - facies Muschelchalk (limestones)</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #003300; border: 1px solid black; margin-right: 5px;"></span> Triassic - facies Buntsandstein (red beds)</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #001d00; border: 1px solid black; margin-right: 5px;"></span> Paleozoic</li> </ul>	<p><b>SIGNS</b></p> <ul style="list-style-type: none"> <li><span style="display: inline-block; width: 15px; height: 10px; border-bottom: 1px dashed black; margin-right: 5px;"></span> Syncline</li> <li><span style="display: inline-block; width: 15px; height: 10px; border-bottom: 1px solid black; margin-right: 5px;"></span> Anticline</li> <li><span style="display: inline-block; width: 15px; height: 10px; border-bottom: 1px dashed black; margin-right: 5px;"></span> Overturned syncline</li> <li><span style="display: inline-block; width: 15px; height: 10px; border-bottom: 1px solid black; margin-right: 5px;"></span> Overturned anticline</li> <li><span style="display: inline-block; width: 15px; height: 10px; border-bottom: 1px dashed black; margin-right: 5px;"></span> Downward-facing anticline</li> <li><span style="display: inline-block; width: 15px; height: 10px; border-bottom: 1px dashed black; margin-right: 5px;"></span> Subtractive fault</li> <li><span style="display: inline-block; width: 15px; height: 10px; border-bottom: 1px solid black; margin-right: 5px;"></span> Additive fault</li> <li><span style="display: inline-block; width: 15px; height: 10px; border-bottom: 1px dashed black; margin-right: 5px;"></span> Indifferntiated fault</li> <li><span style="display: inline-block; width: 15px; height: 10px; border-bottom: 1px solid black; margin-right: 5px;"></span> Normal contact</li> <li><span style="display: inline-block; width: 15px; height: 10px; border-bottom: 1px dashed black; margin-right: 5px;"></span> Unconformity</li> <li><span style="display: inline-block; width: 15px; height: 10px; border-bottom: 1px solid black; margin-right: 5px;"></span> Transitional contact</li> <li><span style="display: inline-block; width: 15px; height: 10px; border-bottom: 1px solid black; margin-right: 5px;"></span> Normal dip</li> <li><span style="display: inline-block; width: 15px; height: 10px; border-bottom: 1px solid black; margin-right: 5px;"></span> Overturned dip</li> </ul>
--	--	--

1: 25000  
 Projection UTM: datum ED50, zone 30, international ellipsoid  
 Topography: 100m equidistance