

INVESTIGATING THE ROLE OF IBERIA AND ITS INTERPLAY WITH THE NEWFOUNDLAND AND IRISH OFFSHORE MARGINS USING PLATE RECONSTRUCTIONS

Michael T. King, J. Kim Welford & Alexander L. Peace

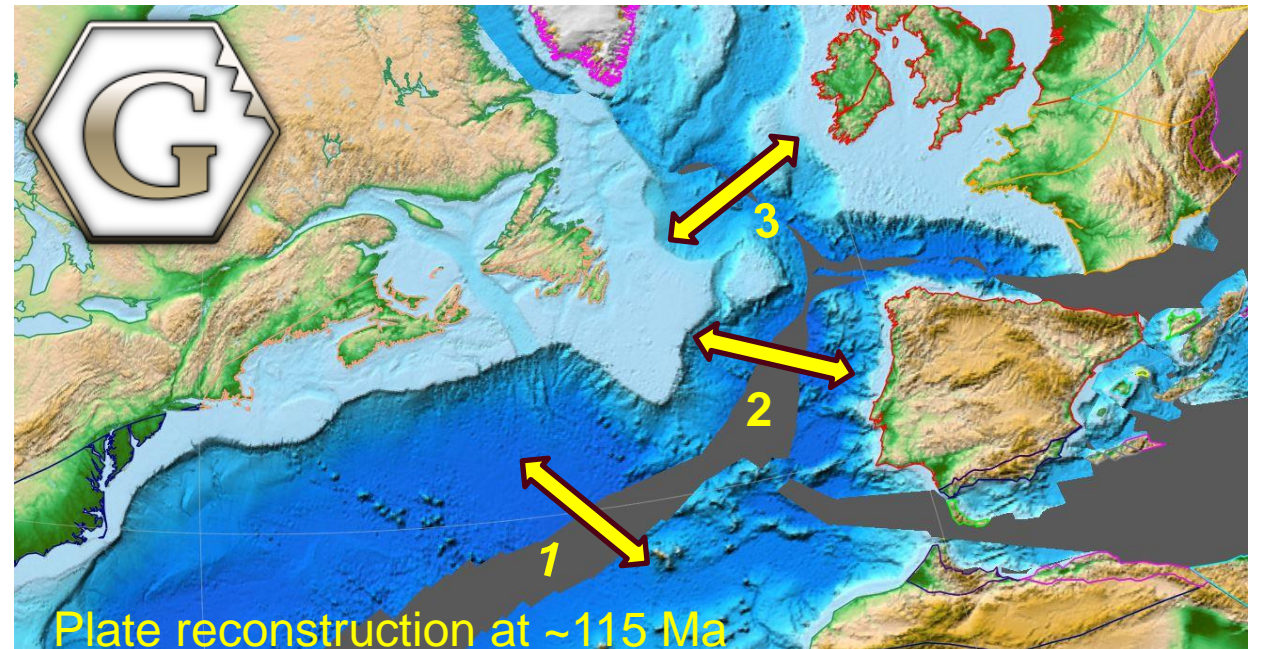
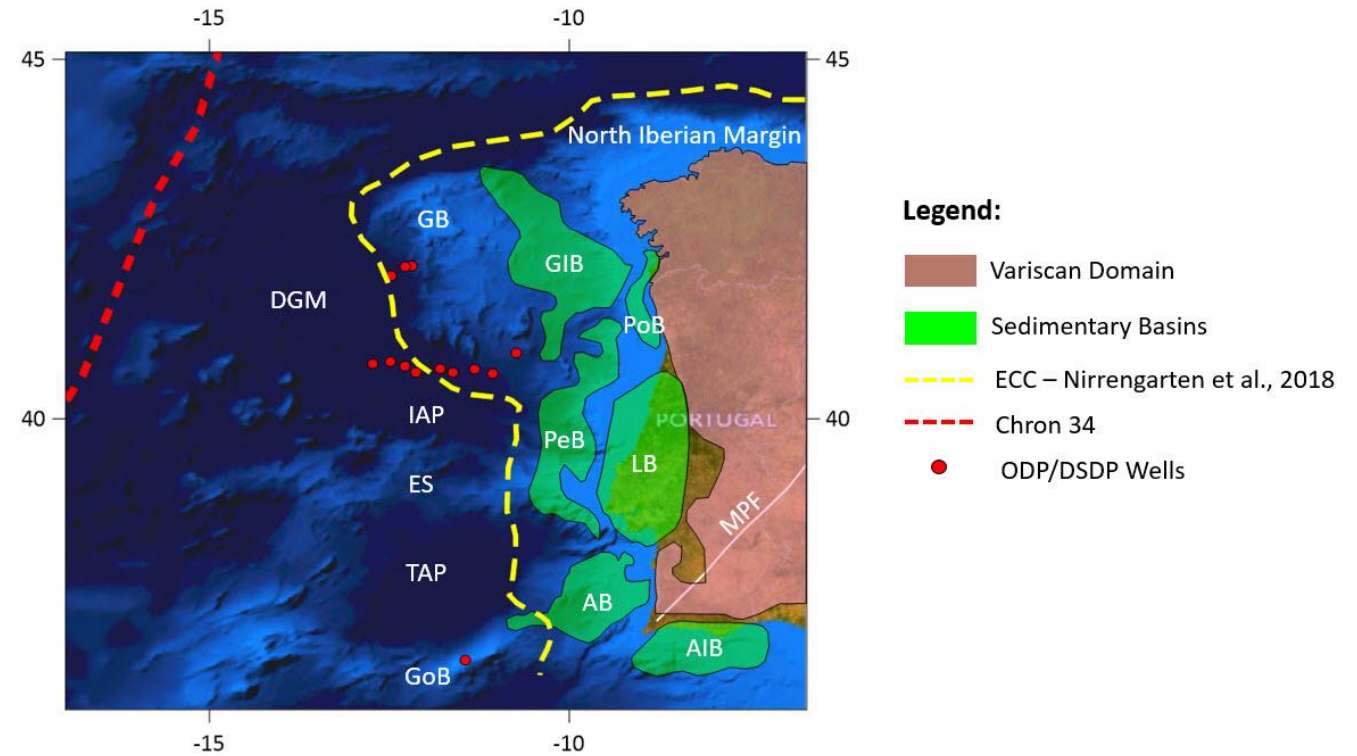
Department of Earth Science, Memorial University of Newfoundland, St. John's, Newfoundland and Labrador, Canada

School of Geography and Earth Sciences, McMaster University, Hamilton, Ontario, Canada

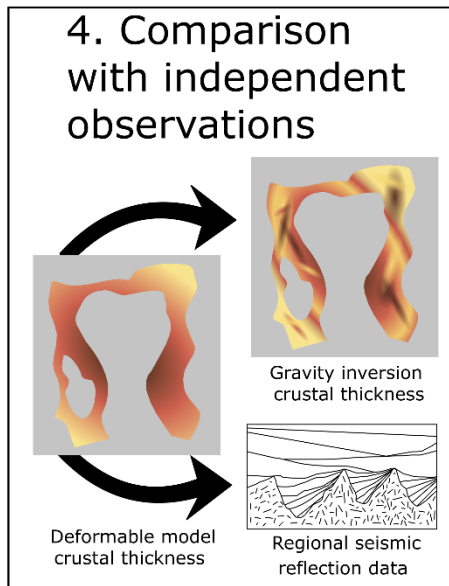
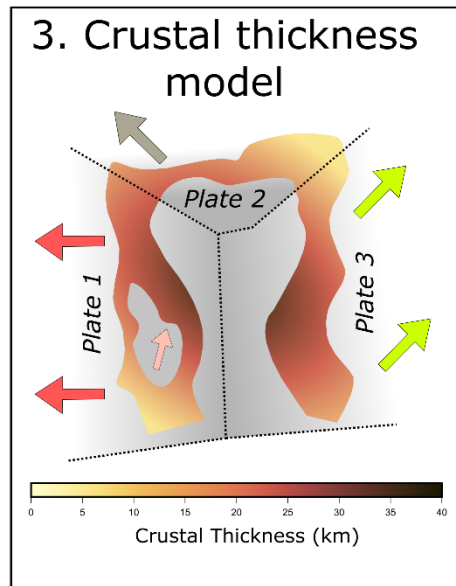
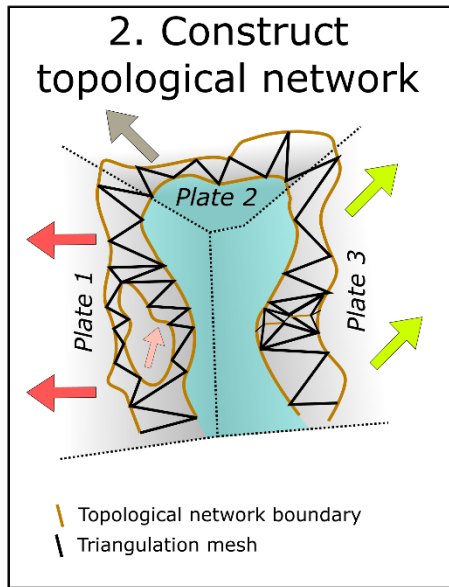
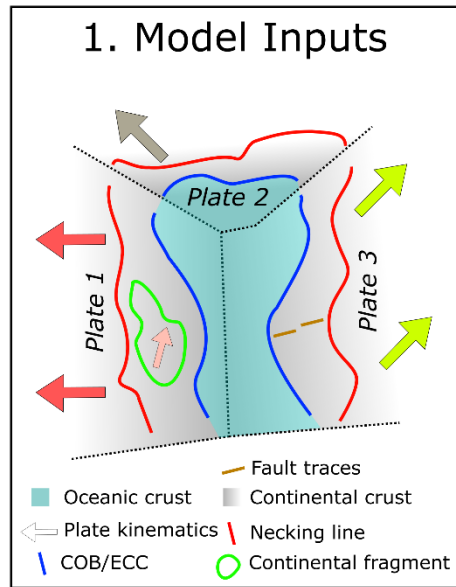


INTRODUCTION

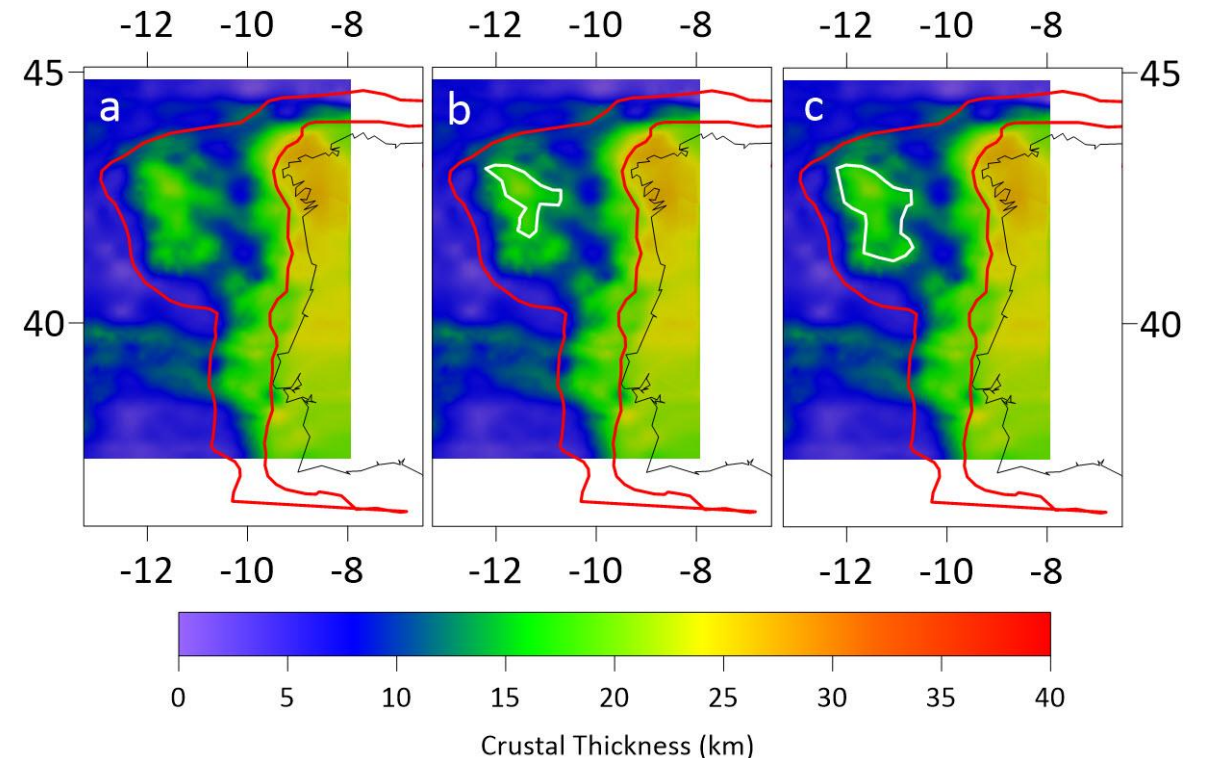
- Project goals are to investigate:
 - The role of the Galicia Bank during the formation of the West Iberian (WIB) margin using deformable plate tectonic models created in GPlates.
 - Timing and extent of deformation throughout the WIB margin:
 - Relationship with the Newfoundland and Irish offshore margins.
 - Interplay between the Galicia Bank and Flemish Cap.
 - Independent motion of continental fragments and their interplay with inherited structures during rifting and subsequent opening of the southern North Atlantic.



DEFORMABLE PLATE MODELING STRATEGY



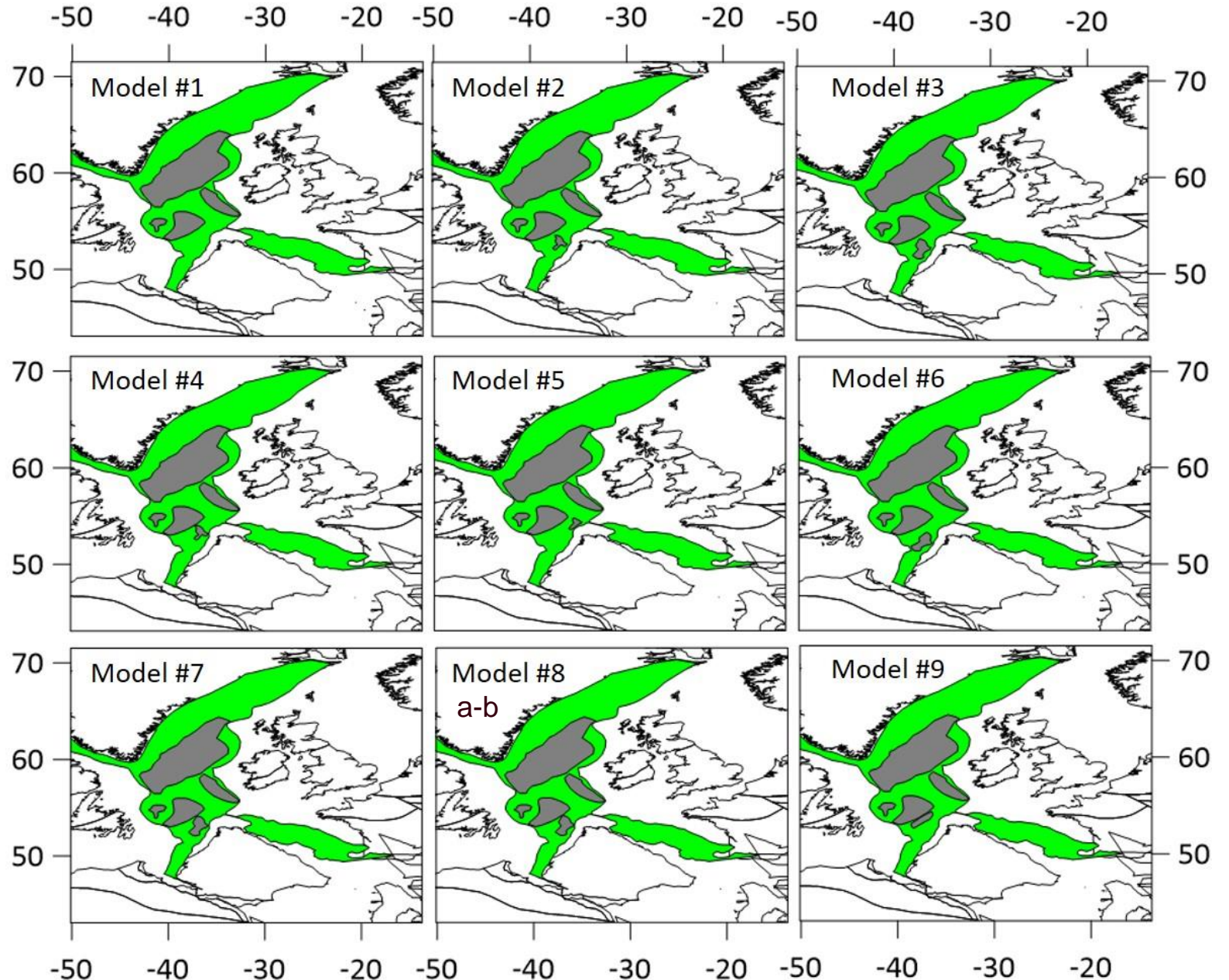
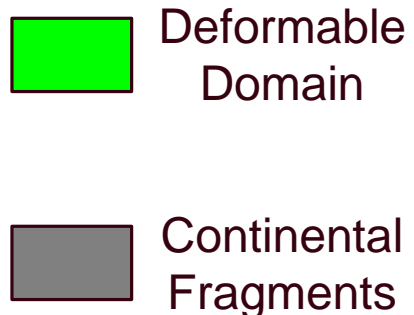
- GPlates 2.2 used to create deformable plate tectonic models of the WIB margin from 200 Ma to present day.
- Models built using:
 - Previously published constraints - Nirrengarten et al. (2018) (necking line and edge of continental crust shown in red) and Peace et al. (2019).
 - Newly defined geometries of polygons representing the Galicia Bank (white) based on gravity inversion crustal thickness.
 - New poles of rotation for the Galicia Bank.



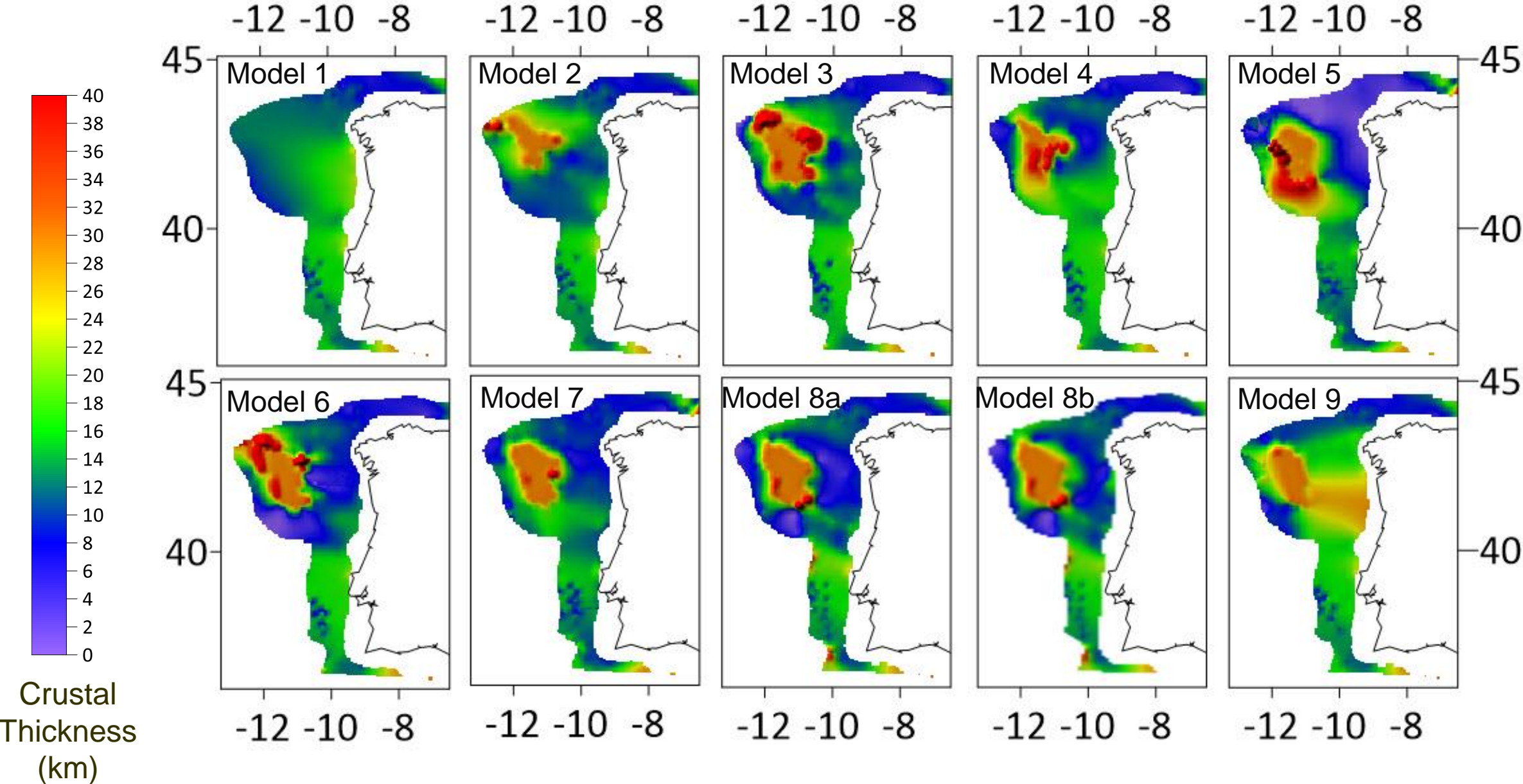
modified after Peace et al. (2019)

WIB MARGIN DEFORMABLE MODELS

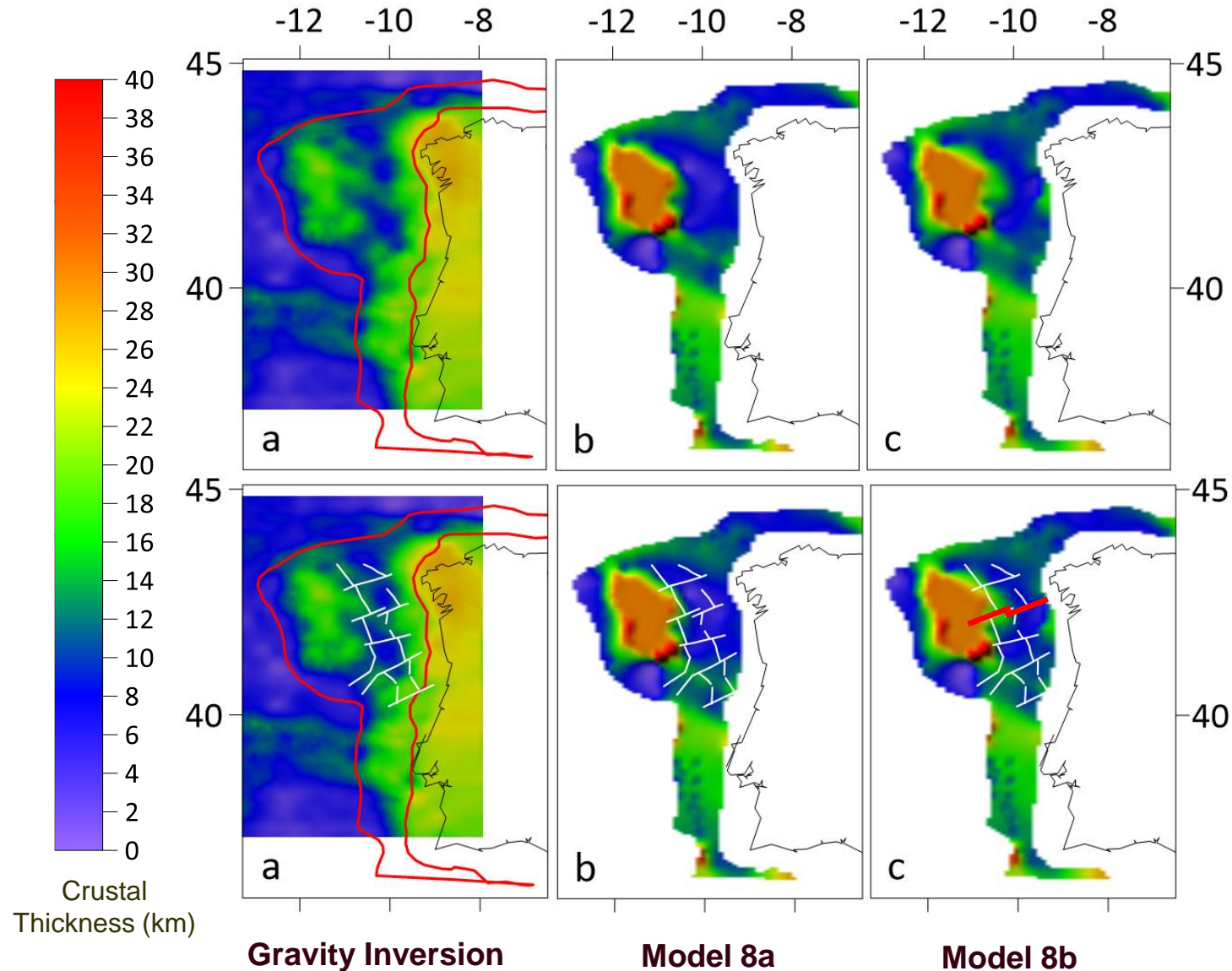
- WIB margin deformable plate models @ 200 Ma.
- Variations in each model:
 - Galicia Bank (GB) geometry.
 - GB starting position at 200 Ma.
 - GB Jurassic and Cretaceous poles of rotation.
 - Attempts to account for the effect of inherited Variscan structures during rifting (Model 8b).



PRESENT DAY CRUSTAL THICKNESSES



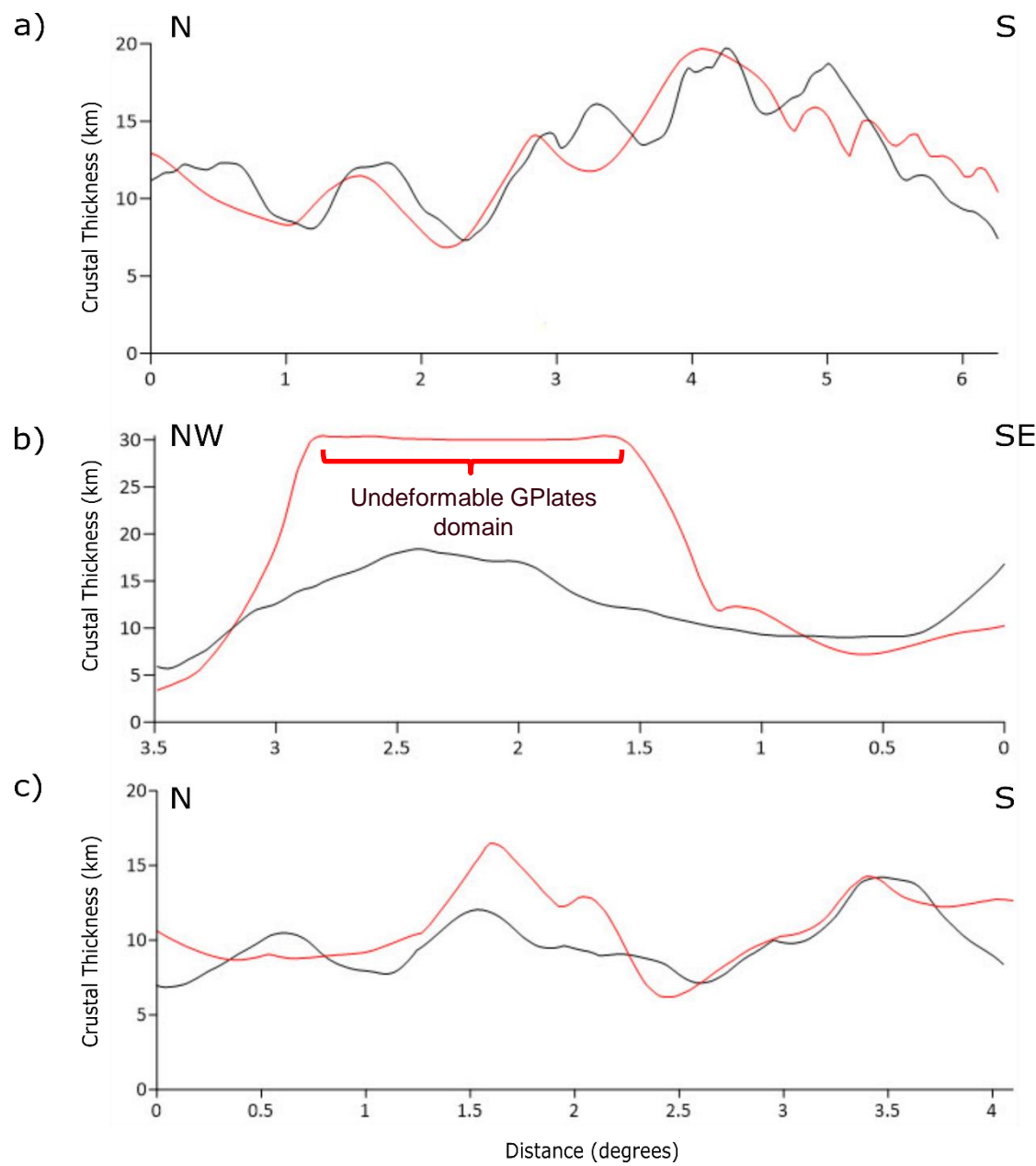
DISCUSSION – GALICIA INTERIOR BASIN



Fault traces (white) from Murillas et al. (1990)

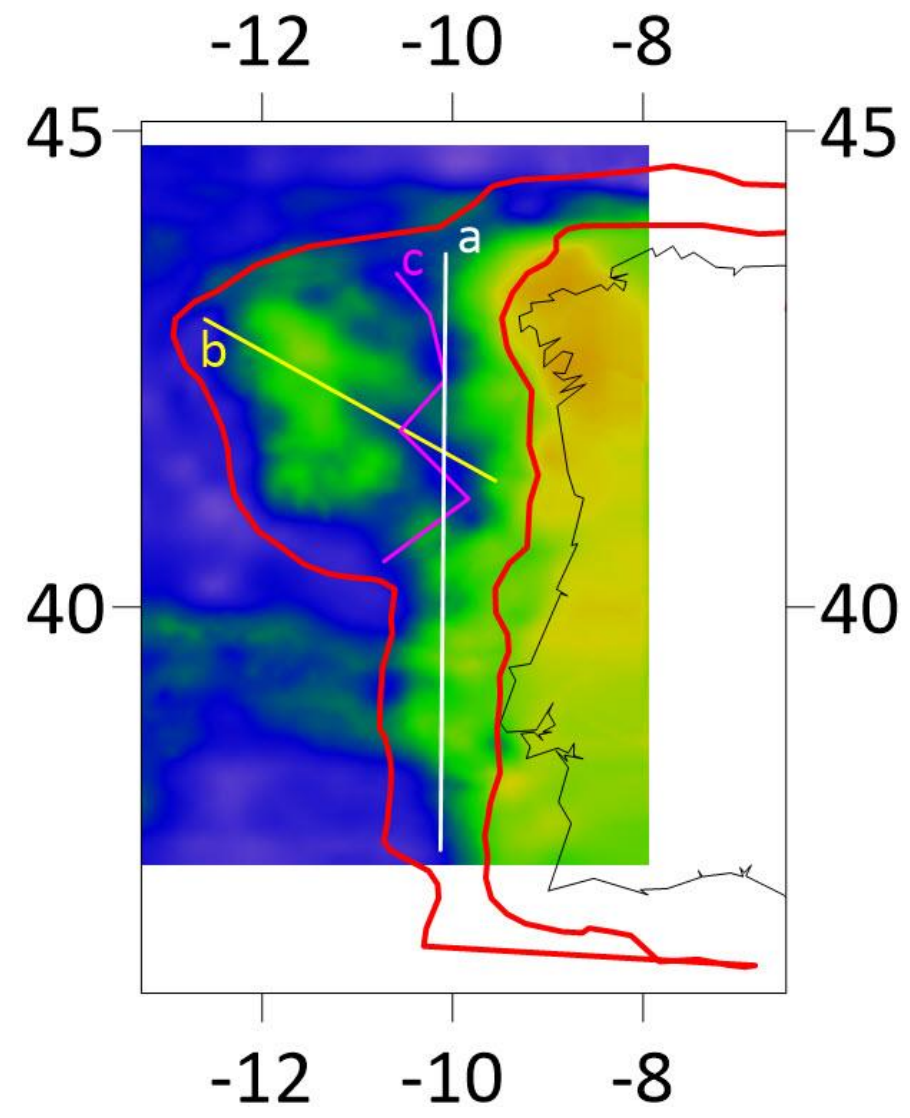
- Kinematics of the Galicia Bank produce crustal thickness variability mainly within the Galicia Interior Basin in all models tested.
- Models 8a and 8b provide the closest match to crustal thickness results obtained from gravity inversion.
- Differences between models 8a and 8b:
 - Both use same poles of rotation for the Galicia Bank.
 - Model 8b represents an attempt to account for the effect of inherited structures (**highlighted in red**) within the Galicia Interior Basin.

GRAVITY INVERSION COMPARISON

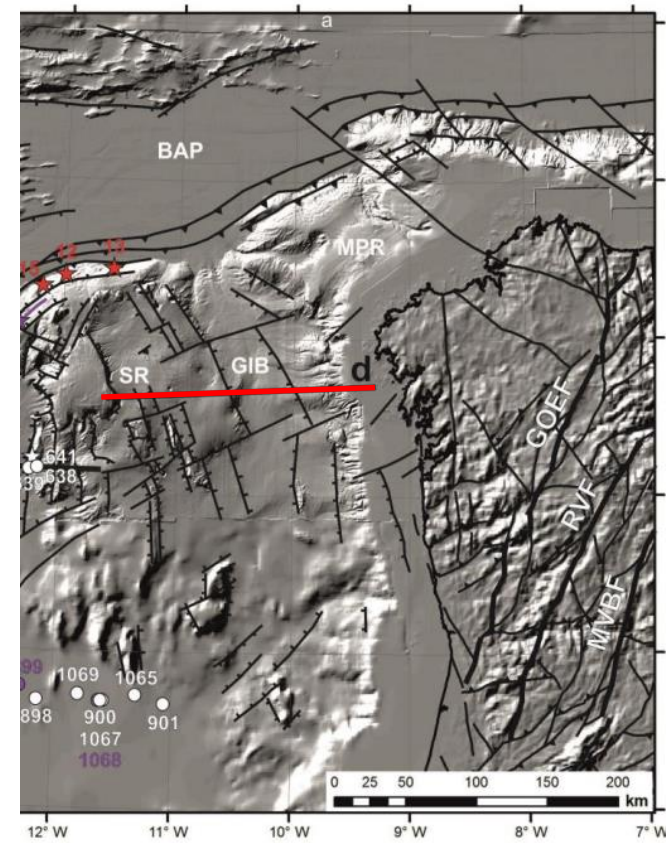
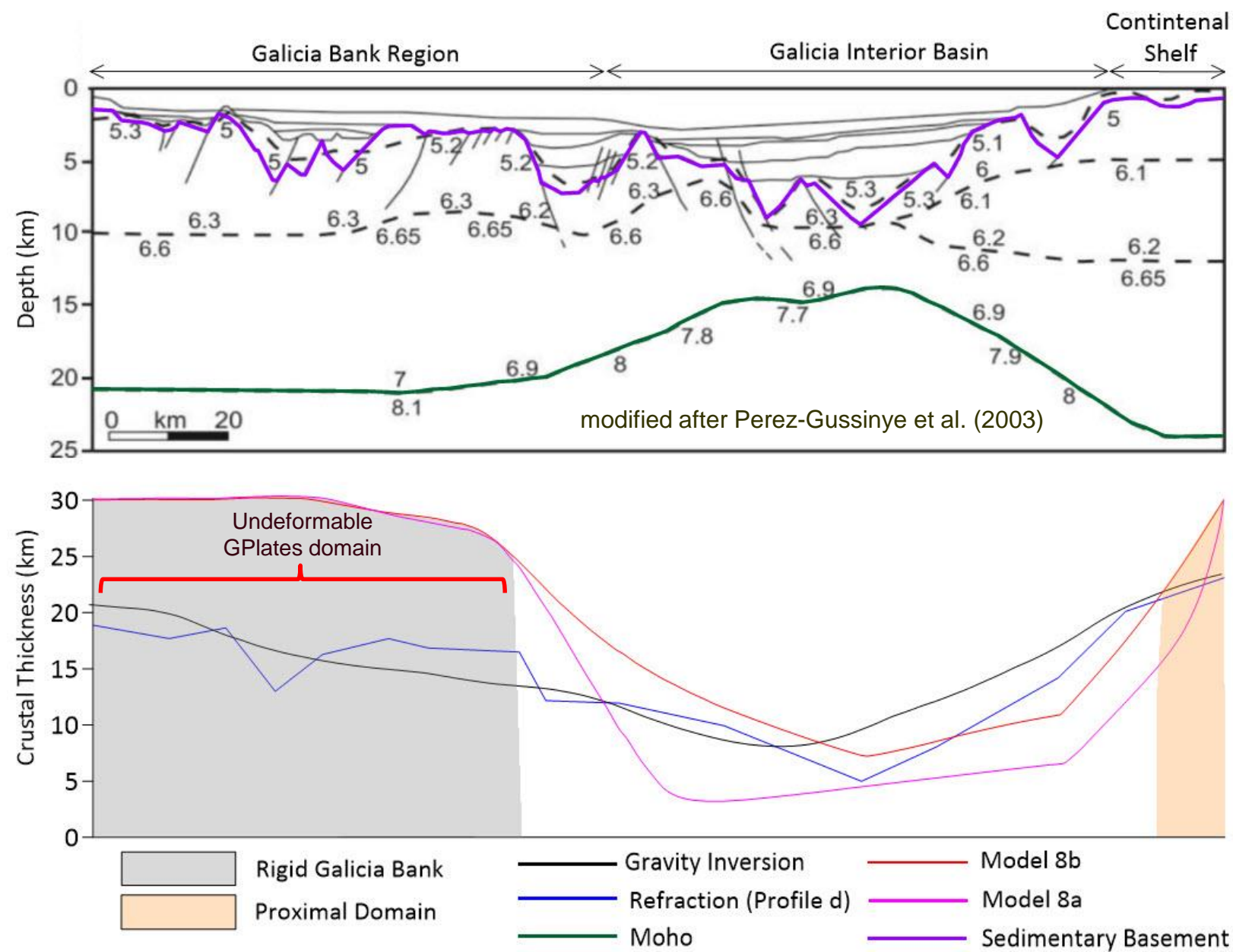


— GPlates Model 8b

— Gravity Inversion



COMPARISON WITH REFRACTION DATA



CONCLUSIONS

- GPlates has served as a useful tool for evaluating the plate kinematics of Iberia.
- The Galicia Bank and its independent motion played an important role during the formation of the West Iberian margin – Galicia Interior Basin in particular:
 - Models 8a and 8b provided the closest match with respect to gravity inversion results.
 - Structural inheritance was an important contributor during the evolution of the WIB margin – demonstrated by model 8b results.

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