A preliminary 3D model for the offshore region of CARG Sheet Villa San Giovanni

Bongiovanni S.[1], Agate M.[1], Balsamo L.[1], Caldareri F.[1], Cassataro R.[1], Lo Presti V.[1] & Sulli A.[1]

[1]Università di Palermo, Dipartimento di Scienze della Terra e del Mare, Palermo, Italy.

Corresponding author email: simona.bongiovanni@unipa.it

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The Sheet 588 Villa San Giovanni of the CARG project covers a geologically complex area that includes the Messina Strait and surrounding areas.

The Messina Strait area has long been the focus of geological and geodynamic studies, mainly due to its dynamic tectonic framework that includes active fault systems and ongoing subduction processes. This tectonic setting is responsible for significant seismic activity, with events that can reach great depths, up to about 180 km.

In addition to its geological relevance, the region has attracted considerable socio-economic interest, particularly in relation to the proposed permanent connection between the two sides of the Strait.

Accordingly, the complex geology of the area requires detailed and precise geological modeling.

As part of the CARG project, we constructed a preliminary 3D geological model of the offshore sector that provides information on the subsurface structure.

We used seismic reflection profiles, we converted them from time (TWT) to depth using appropriate velocity models, and, to improve the accuracy of the model, we calibrated the seismic reflection profiles with available well data. The preliminary model we obtained consists of four layers. To highlight the lateral variation of the model, we also constructed thickness maps of each layer.

Future steps in this study include the acquisition of new seismic reflection profiles to have greater areal coverage of the data. The integration of these new seismic profiles, together with other geophysical and geological data, will help to obtain a more accurate and extensive subsurface structure model.

This study is also intended to contribute to a better comprehension of the geological environment in the Messina Strait, providing essential data for seismic hazard assessment.