MAIN GEOTHERMAL TRENDS AND IMPLICATIONS IN THE TYRRHENIAN SEA

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Abstract

Over 200 heat flow measurements have been carried out in the Tyrrhenian Sea, mostly since 1977 as part of the "Heat Flow Map for Italy and surrounding seas" Italian program as well as part of the cooperative French Italian "Tyrrhenia" program.

All data have been corrected for the influence of the Plio-Quaternary sedimentation.

According to Sclater et al. (1980), the measurements were rewiewed following a sedimentary environment evaluation; in this way areas mainly affected by shallow thermal effects in the zones with maximum density of data have been displaied. Filtering these shallow contributions, the major regional geothermal trends are obtained.

Thermally the Tyrrhenian basin appears to be divided in two distinct regions, with different geothermal behaviours.

The Northern side of the basin seems to be connected with the continental structures involved in the interaction between Corsica and Tuscan margins. The maximum heat flow area, located offshore Civitavecchia, is related to the tensile structures of the Tuscan geothermal Province.

The most important thermal features of the Central and Southern side are located along the central belt NW-SE trending. The minima heat flow values, in the perityrrhenian areas, are related to the continental margins of the basin, while the maxima are connected with the stretched and thinned area localized in the bathyal plain.

The Central Fault seems to separate these two geothermal domains and probably marks a boundary between the stretched Crust SE located and a thicker continental Crust NW located. Consequently, the geothermal trend strictly depends on the crustal thickness and on the age of both magmatic and tectonic activity.

Taking into account the geothermal features and the other geological and geophysical information of the Tyrrhenian Sea, an evolutive model is hypothesized, predicting a generalized stretching of an initially continental Crust, accompanied by intensive rifting phases, which locally may have favourished the onset of oceanic Crust.