

THE NEW CROSS-BORDER BOUGUER ANOMALY MAP, GREECE
AND ALBANIA ACCORDING TO WGS 84

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The unification parameters of the gravity data which lead to the compilation of the cross-border Bouguer anomaly map of Albania and Greece will be presented. The specifications of the WEEGP were used.

This study is aimed at unifying the gravity fields of Albania and Greece and intended to be extended to the rest of the Balkan Countries.

The data sets to be unified have been acquired and compiled at different periods and with different processing parameters.

The most important step in the unification of different gravity data is the link of these 1st order networks. The data from Albania were referred to the "0" station of Albania in Tirana. Since the Greek 1st order network is linked to the international Gravity network through its East Air Terminal station (E 23°44'31", N 37°53'24", h=30 m, Gravity value = 980042.605 + 0.010 mgal IGSN 71) it was decided to link the "0" station of Albania to that point.

The second important step is the use of the common set of processing parameters i.e. the formulas for the calculation of the Normal field and the corrections which will be applied to obtain the unified anomaly maps. The formulas of the WEEGP project were adapted according to the Progress Report I of West-East Europe Gravity Project which both countries joined in '93 and '94 respectively.

According to what is reported, the main source for the height differences between different countries with small changes in the geoid is due to the definition of the mean sea level. This fact influences the correction which is applied to obtain the anomaly maps. In this study, we wish to quote Free air and Bouguer anomalies with at least 0.1 mgal accuracy. A height accuracy of 0.32 m for the Free air and 0.51m for Bouguer (density=2670 kg/m³) is needed to give gravity ± 0.1 mgal accuracy. The World Geoscientific System 1984 (WGS84) is used to define the normal gravity formula. The atmospheric correction applied is 0.87 and 0.82 for Albania and Greece respectively. The formula for this correction is as follows:

$$= 0.87 \cdot e^{-0.116 H} \cdot 0.47 \text{ mgal} \quad H = \text{Kilometres}$$

The Free Air Anomaly (FAA) = $g_{obs} - g_0 + g_A + g_{Free}$

Air Correction and the Simple Bouguer Anomaly = FAA - $0.0419 \cdot d \cdot h$

We consider the realization of the above map important since will greatly help in the understanding of the very complex geology of the area. Abnormal features of the behaviour of isolines are readily identified on the map which previously were not.