Following previous findings from the Thailand-EU joint research project carried out during 2009-2010, a new research project funded by the Thailand Research Fund has continued to exploit the GPS technique to monitor and model vertical land motions induced by the Sumatra-Andaman earthquake. It has been shown that up to the end of 2009 Thailand has been co-seismically displaced and subsequently undergoing a post-seismic horizontal deformation ranging from 8.4cm to 70.2 cm. Largest horizontal displacements were observed in the southern part, while moderate and small displacements were seen in the central and northern parts of Thailand. Apart from horizontal displacements throughout Thailand, it became evident that after a couple years of Continuous GPS measurements large part of Thailand appears to start subsiding at rate approximately 1 cm/yr. Although this post-seismic vertical motion is not expected to continue significantly for the coming decades, it is the first time that such vertical deformations at large distances (650-1500 km away from the earthquake’s epicentre) have been recorded. This phenomenon may have a considerable impact on the socio-economic development of coastal and low-lying areas especially in the greater Bangkok area. In this study, a geophysical model based on a combination of slip on the fault plane and relaxation in the asthenosphere is used to explain and predict vertical motions in Thai region. Such a subsidence is well predicted by models with post-seismic relaxation in the asthenosphere. Its modelled final magnitude depends strongly upon rheological details of the subduction zone area but does not exceed 30cm.