Turkey occupies a critical segment in the Alpine-Himalayan orogenic belt that is characterized by many active fault lines. Numerous earthquakes of varying magnitudes have occurred on these fault lines over the years. A significant portion of these earthquakes have been recorded along the Fethiye Burdur Fault Zone (FBFZ). Unfortunately, the latest earthquakes that happened on the FBFZ led to a large loss of human life and extensive economic losses. Southwest Anatolia, including the FBFZ, is monitored by 44 Global Navigation Satellite System (GNSS) stations, comprised of 16 permanent and 28 campaign stations. Measurements have been conducted by combining observations from 2003 to 2006 (Erdogan et al., 2008) with new observations from 2009 and 2010. The combined processes have yielded an updated velocity field of the region. In addition, the effects of the post 2007 earthquakes on the GNSS stations were also investigated. The strain analysis based on the observations made between 2003 and 2010 display high consistency with the earthquakes that occurred in the region. Also, it was observed that the strain analysis is in accordance with the North - South opening created as a result of the African plate being submerged under the Anatolian plate in the southern of the island of Crete.