In this work we tried to investigate the temporal variations of the crustal structure by using a number of P and PmP (Moho reflected) wave arrival times recorded by 107 digital seismic stations from earthquakes that occurred separately in 2002, 2003, 2004, and 2005-2006 to determine P-wave velocity structures in and around the source area of the 4 July 2006 Wen-An earthquake (Ms 5.1) in different periods. Our results show that tomographic images inferred from the data sets in different years are all dominated by a low-V anomaly in the lower crust under the Wen-An source area. The results from the 2005-2006 P and P + PmP data sets all show a relatively larger increase of the low-V anomaly under the Wen-An source area in the amplitude and extent as compared with those from the 2003 and 2004 P and P + PmP data sets. Our results suggest that the occurrence of the Wen-An earthquake is not only related to the long-term influence of fluids that decrease the effective normal stress on the fault plane, but also closely associated with the drastic increase of such influence. However, this study is just an experimental work and the results are still preliminary. In future studies it is necessary to improve the resolution of crustal tomography in order to detect any temporal variations of the crust structure in the source area of a large earthquake.