Since 2002, the GRACE (Gravity Recovery and Climate Experiment) mission has been providing a precise survey of the Earth's time-variable gravity field, and has greatly improved understanding of mass distribution on and near the surface of the earth. A gravity network in China mainland is established to determine gravity variations using LCR-G relative gravimeter and FG5 absolute gravimeter about every 2 years from 1998. Based on these observations, secular trend of gravity changes in China mainland are obtained, at the same time, time serious of GRACE and absolute gravity changes at two stations are also obtained by eliminating the vertical displacement effect on absolute gravity changes using GPS results. Co-seismic gravity changes caused by the 2008 Wenchuan earthquake (Ms8.0) are computed using dislocation theory with 300km Gaussian filter. A preliminary comparison, explanation and discussion on the characteristics of the long term gravity change observed by GRACE, terrestrial and model are presented in this paper. The results show that, GRACE has the ability to detect long term gravity changes caused by the global water storage, land hydrology, polar ice sheets, and mountain glaciers. At the two stations, the GRACE trends are similar to absolute gravity trends, in north part of China, the figure are strong similarities between GRACE and terrestrial gravity measurements, indicating the presence of large-scale changes in ground water storage. The terrestrial gravity changes could be viewed as a precursor of the Wenchuan earthquake.