The great earthquake, Mw 8.8, occurred in Chile on 27 February, 2010. The number of casualties by this earthquake was reached 800, and more than 500 people among that were killed by tsunamis. The large tsunami was generated by the earthquake and propagated through Pacific and reached along the coast of Pacific include Hawaii, Japan, and Alaska. The tsunami was observed at DART real-time tsunami monitoring systems installed in the Pacific by NOAA-PMEL and also tide gauges around Pacific. In this paper, the tsunami waveforms observed at 6 DART stations and 9 tide gauges near the source area are used to estimate the slip distribution of the 2010 Chile earthquake. The source area of 500km x 200km is divided into 40 subfaults of 50 km x 50 km. The tsunami waveforms are numerically computed by solving the linear long wave equations. Computed tsunami waveform at each station from each subfault is used as a Green’s function for the tsunami waveform inversion. The results of the tsunami waveform inversion indicated that the maximum slip amount is estimated to be 14 m at north of the epicenter. The total seismic moment obtained from the slip distribution is estimated to be 1.6 x 10^{22} Nm (Mw 8.7) by assuming the rigidity of 3×10^{10} N/m². The inferred slip distribution suggests that the total length of the ruptured area is 450 km. We also use the InSAR data which observed the co-seismic deformation due to the earthquake to test our result.