The 2011 off the Pacific coast Tohoku earthquake (Mw9.0), the largest earthquake in the recorded history of Japan, occurred at 14h46m on March 11 (UT+9h). The Pacific coast of the eastern Japan has been severely damaged by the tsunami caused by it. Being based on the magnitude and the focus determined by real-time seismogram analysis, JMA issued domestic tsunami warnings in three minutes after the earthquake by operating scenario-based tsunami database. Although the first warning underestimated tsunami height because of underestimation of the seismic magnitude, tsunami detection by GPS buoys, which were installed 10-20 km off the coast by MLIT, made possible to upgrade it quickly. However, JMA failed to receive real-time tsunami data of most observatories along the Pacific coast of Tohoku region because of data disruption; this caused difficulty in monitoring ongoing tsunami. It was after the field survey operation that JMA found distribution of tsunami height (e.g. 9.3m at Soma, Fukushima pref.) of this area. By the way, source area derived by tsunami arrival times to various onsite offshore detectors, such as GPS buoys, cabled ocean bottom pressure gauges, and others, is approx. 550 km in length and 200 km in width; real-time application of this method is promising approach for rapid estimation of tsunami potential of huge earthquakes, whose magnitudes are in general too large to be evaluated quickly from seismograms. Moreover, the inversion of the offshore data can provide rough source model of initial sea-surface height distribution and coastal tsunami forecasts.