

Seismicity changes in western Japan associated with the great earthquakes near Nankai trough and their contemporary implications

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<http://www.ism.ac.jp/~ogata/JAPINDEX.html>

First of all, I have examined the homogeneity of the Hypocenter catalog of the Japan Meteorological Agency (JMA) during 1926-1950 with the exception during the early periods of the aftershock activities of strong earthquakes. Most of the large earthquakes took place during the period 1943-1944 before the great earthquakes. Thus the background earthquakes of each size (magnitude) seem to be homogeneously detected throughout the period, although one may have been concerned with the lowering of the detection rate during the late period of the World War II (March–August 1945) when some JMA observatories were closed owing to the fire storms by air raids.

Significant changes in seismicity (quiescence and activation) took place during the period of 1944–1946 in some regions in western Japan. They are well explained by the corresponding changes in Coulomb failure stress caused by the 1944 Tonankai earthquake of M7.9 and the 1946 Nankai earthquake of M8.0, both of which occurred in the Nankai trough. From the seismicity changes except for such coseismic changes I try to identify precursory anomalies such as the quiescence in several regions before the Tonankai event and the enhanced activity in southern Kii peninsula before the Nankai event. These quiescence and enhanced activity may be due to precursory aseismic slips in an area on the plate interface downdip of the Tonankai rupture and slips transferring from the Tonankai to Nankai rupture zone. The records of felt shocks at the Wakayama Observatory during 1900–1995 provide support for the quiescence in the Wakayama District during 1944–1946, as well as a scenario of seismicity cycle till the next great event(s) in the Nankai trough to occur sometime this century.

In this talk, using other available datasets of felt shocks, I would like to confirm the precursory anomalies by analysis of the aftershock sequences of the strong earthquakes in the western Japan before and after the great earthquakes, applying the Epidemic-Type-Aftershock-Sequence (ETAS) model. Similarly, I will analyze the aftershock sequences of the recent strong earthquakes in the western Japan and activity in Kinki District in order to discuss the present status toward the coming earthquake in Nankai area.