

**The Nankai Trough Earthquake Information:  
an interim measure in transition from "The Tokai Earthquake Prediction"**

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In Japan, the Tokai Earthquake, a megathrust earthquake beneath the Tokai region with a magnitude of around 8, was expected to occur in the near future mainly because of the history of earthquakes around the region. The Nankai Trough Earthquakes, megathrust earthquakes with a magnitude of around 8 or more along the Nankai Trough, has occurred repeatedly with a repetition interval of roughly 100-150 year, while the plate boundary beneath the Tokai region has not experienced large seismic slip since the 1854 Ansei Earthquake (Figure 1). This seismic gap area of the plate boundary has been assumed to be the focal area of the Tokai Earthquake. Because the Tokai Earthquake could cause enormous damage, and there lies a possibility of short-term prediction, the Japanese government enacted the Act on Special Measures for Large-scale Earthquakes for disaster prevention. In the framework of this law, Japan Meteorological Agency (JMA) has undertaken the duty for predicting the Tokai Earthquake. For this purpose, JMA has monitored the crustal activity in and around the Tokai region, and has carried out a service on the Tokai Earthquake Prediction information.

Nowadays, however, the next megathrust earthquake is considered to be imminent in the entire region along the Nankai Trough, not only in the Tokai region, as more than 70 years have passed since the last two Nankai Trough Earthquakes, the 1944 Showa Tonankai Earthquake and the 1946 Showa Nankai Earthquake (Figure 1). In addition, the strong measures to be taken after the Tokai Earthquake prediction have become regarded as not appropriate considering the uncertainty of short-term prediction, that is, the earthquake could occur without detection of any anomaly or the earthquake could occur long time (it may be several months, yeas or decades) after detection of some anomalies.

Therefore, the Japanese government decided to reconsider measures for the Nankai Trough Earthquake and to start interim measures during the consideration. As one of the interim measures, JMA started a service on the Nankai Trough Earthquake Information on 1<sup>st</sup> November 2017. As the information deals with the entire region along the Nankai Trough, JMA stopped to issue the Tokai Earthquake Prediction information, which focuses only on the Tokai region, at the start of the service on the Nankai Trough Earthquake information.

The main purpose of the Nankai Trough Earthquake information is to inform public that the possibility of occurrence of a large earthquake along the Nankai Trough becomes relatively higher than usual based on real-time observation of earthquakes and crustal deformation. Some cases where the information would be issued are shown in Table1. In order to fulfill this duty, JMA convenes the Nankai Trough Earthquake Assessment Committee that consist of experts to receive advices for assessment of possibility of occurrence of a large earthquake along the Nankai Trough. When the information on

relative increase of possibility of a large earthquake would be issued, the Japanese government would hold a disaster warning meeting among relevant ministries and agencies to confirm their subsequent efforts and also would call upon residents to reconfirm their regular preparation for earthquakes.

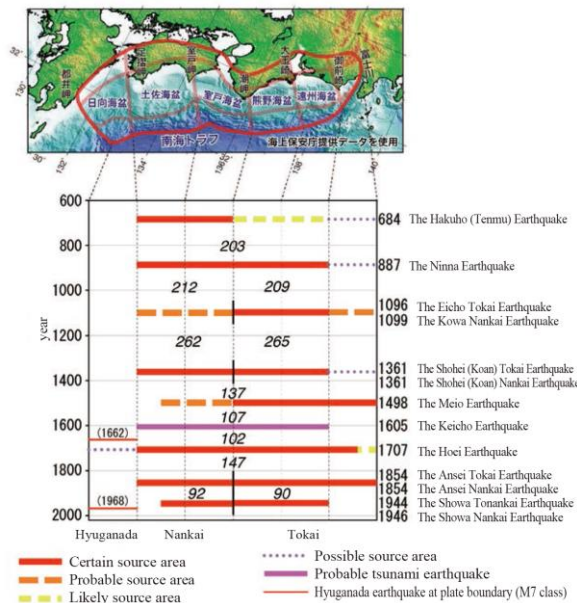


Figure 1. Spatio-temporal distribution of the source area of the Nankai Trough Earthquakes (modified after Long-term Evaluation of the Nankai Trough Earthquake (Second edition), Headquarters for Earthquake Research Promotion)

Table 1. Classification and announcement timing of the Nankai Trough Earthquake information

Information issued by JMA	Announcement timing
The Nankai Trough Earthquake Information (Extra)	<p>The “Extra” information is issued ...</p> <ul style="list-style-type: none"> <li>➤ when anomalous phenomena<sup>*1</sup> are observed along the Nankai Trough and JMA starts/continues investigation whether the phenomena are related to large earthquakes along the Nankai Trough.</li> <li>➤ when JMA assesses possibility of occurrence of large earthquakes along the Nankai Trough is relatively high compared with usual as a result of the investigation on the observed phenomena,.</li> <li>➤ when JMA has assessed the possibility of occurrence of large earthquakes along the Nankai Trough is no longer relatively high compared with usual( after issuance of the “Extra” information).</li> </ul>
The Nankai Trough Earthquake Information (Regular)	<p>The “Regular” information is issued ...</p> <ul style="list-style-type: none"> <li>➤ after a monthly meeting of the Nankai Trough Earthquake Assessment Committee.</li> </ul>

\*1) As anomalous phenomena, an earthquake of M7 or larger along the Nankai Trough, or significant strain changes observed by strain meters in Tokai area etc. are assumed.