

Chapter 1-8

Severe Earthquakes in the Lake Biwa Area

Abstract

In the course of its history, the area around Lake Biwa has been damaged by severe inland and interplate earthquakes. The Kanbun Earthquake of 1662 caused debris avalanches, claiming the lives of 560 residents in small villages. It is surmised that the shrines located to the north of Lake Biwa were washed away by tsunamis in the 12th and 15th centuries.

Keywords: Earthquake, Active fault, Slope failure, Debris avalanche, Tsunami, Ruins

1. Earthquakes around Lake Biwa

The area around Lake Biwa has been damaged by severe earthquakes once every several decades. These earthquakes are classified into two types based on their seismic centers: active faults inland, and the interplate between the Eurasian and the Philippines Sea plates.

Inland earthquakes are caused by the activity of one of several hundred active faults within a 50 km radius of Lake Biwa.

On the other hand, interplate earthquakes in and around the area are known as Nankai or Tonankai Earthquakes, the epicenters of which are located near the Nankai Trough in the Pacific Ocean about 300 km southwest of Lake Biwa. These earthquakes have occurred at intervals of 90 to 150 years.

2. Kanbun Earthquake of 1662

The Kanbun Earthquake occurred in A.D. 1662 and is believed to have been the result of simultaneous activities of the Hanaore and Hiruga Faults, located respectively in the west and the northwest of Lake Biwa (Komatsubara, 2006).

The earthquake caused debris avalanches with a large-scale slope failure known as “the Machii-kuzure” in Katsuragawa Valley in the upper reaches of the Ado River along the Hanaore Fault, claiming the lives of 560 residents in two small villages. The displaced earth and sand blocked the river, causing flooding of houses and agricultural communities upstream. The subsequent collapse of the blockage caused even more serious dam-

age (Imamura et al., 2002).

3. Tsunami to the North of Lake Biwa

The excavation of shrine remains at the Shiotsuko ruins of the 12th century in the north of Lake Biwa revealed that a large number of pillars had been inclined at an angle of 10 degrees away from the lakeshore, five sculptures of deities had been buried in the moat at the north of the remains (the opposite side of the lakefront), the foundation had been covered by a layer of fine sand up to 5 cm thick, and evidence was found that sand had spurted up from underground. These findings indicate that the ruins were struck by a tsunami caused by the earthquake of 1185, washing the shrine building and sculptures inland (Yokota, 2011).

A local legend in Tsukide near Shiotsuko ruins says that Katori Shrine was washed away by a tsunami on Lake Biwa, in the Oei Era (A.D. 1394 – 1427).

Hiroyuki Ogura
(Faculty of Literature, Kobe College)

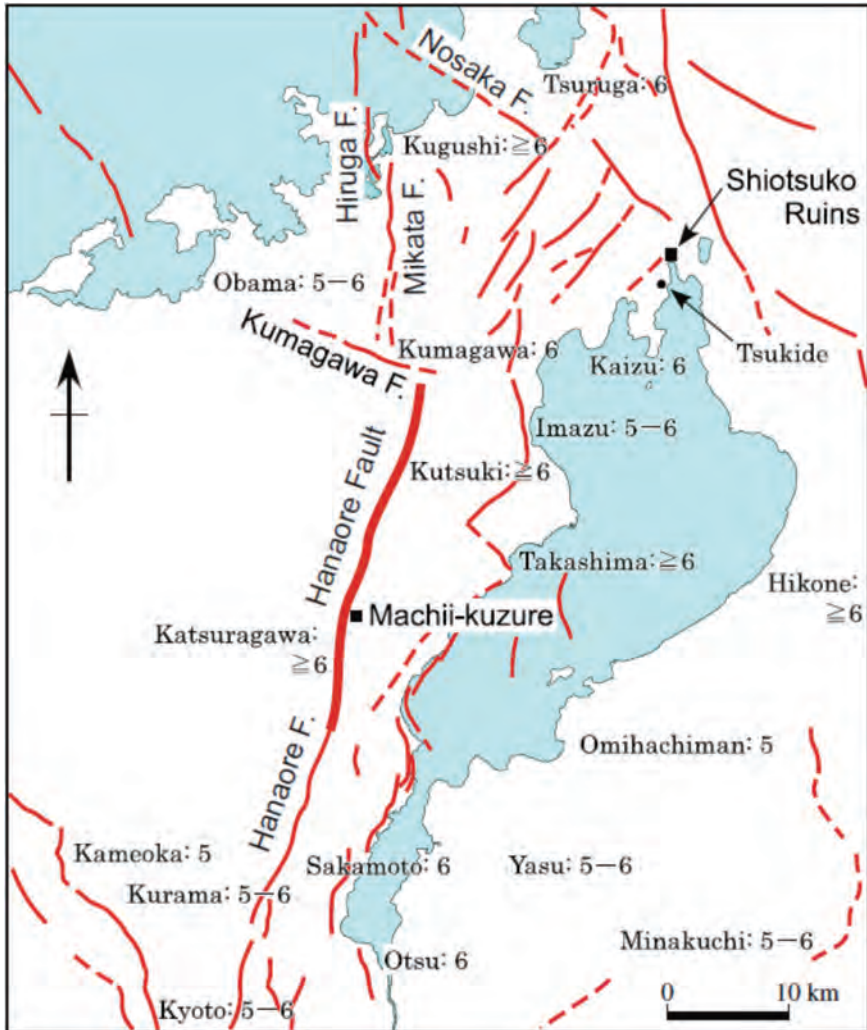


Fig. 1-8-1 Seismic intensity in the case of Kanbun Earthquake of AD 1662, and major active faults around Lake Biwa.

The number on the right side of each location name indicates seismic intensity on the Japanese seismic scale up to 7. The northern part of the Hanaore Fault (bold line) is regarded as the point of dislocation that

caused the Kanbun Earthquake. This figure is based on Usami (2003) and Nishiyama et al. (2005).