



INFORMATION CONCERNING THE ASSESSMENT OF AN EARTHQUAKE DISASTER IN SHIZUOKA PREFECTURE

Takayoshi IWATA¹

¹ Supervisor, Disaster Prevention Bureau, Government office of Shizuoka Prefecture
Shizuoka, Japan, takayoshi1_iwata@pref.shizuoka.lg.jp

ABSTRACT: The Tokai Earthquake currently expected to occur in the near future will be a great earthquake of magnitude 8. The damage caused by the Tokai Earthquake will be fairly intense. In addition, the damage will be extensive. For this reason, residents need to have a strong consciousness of “protecting one's own life” and “protecting one's community together”. In Shizuoka Prefecture, we have positively offered information concerning the basic geological data and the hazards associated with such a regional disaster so that residents can recognize the necessity to prepare earthquake countermeasures.

Key Words: The Tokai Earthquake, Earthquake countermeasures, Hazards associated with a regional disaster, Protecting one's own life, Protecting one's community together

INTRODUCTION

In the coastal areas of south-west Japan, where the Philippine Sea plate is subducting under the Eurasian plate, large earthquakes of approximately the same scale occur repeatedly in the same areas. The past earthquake damage, tsunami, landslides and building collapse have been detailed in Japanese historical records. The Tokai Earthquake, which is one of the repeatedly occurring earthquakes, is a great earthquake of magnitude 8, and has occurred repeatedly at intervals of about 100 to 150 years. The last earthquake was the Ansei Tokai Earthquake which occurred in 1854, and 150 years have passed since the Ansei Tokai Earthquake. So, the Tokai Earthquake is currently expected to occur in the near future. The focal region of the Tokai Earthquake spreads directly under Shizuoka Prefecture, which holds a large population.

The damage from the Tokai Earthquake will be fairly intense. In addition, the influence of damage will be spread fairly broadly. For this reason, residents need to have a strong consciousness of “protecting one's own life” and “protecting one's community together”. In Shizuoka Prefecture, we have positively offered information concerning the basic geological data and the hazards associated with such a regional disaster so that residents can recognize the necessity to prepare earthquake countermeasures.

SIMULATION OF THE EARTHQUAKE DAMAGE

If the Tokai Earthquake occurs, it is presumed that the whole region of Shizuoka Prefecture will experience a seismic intensity greater than 6-. The plain part over which a big city is distributed presumes a seismic intensity 6+. The area where ground is soft is presumed to experience a seismic intensity 7. (*This seismic intensity is JMA scale.)

In Shizuoka Prefecture, we simulated the damage that the Tokai Earthquake will cause. In the worst case, there are 5,900 dead persons, the seriously injured is presumed to be 19,000 persons, and those who are injured moderately are presumed to be 86,000 persons. Furthermore, collapsed buildings will amount to about 750,000 buildings. This is about half of all the buildings in Shizuoka Prefecture.

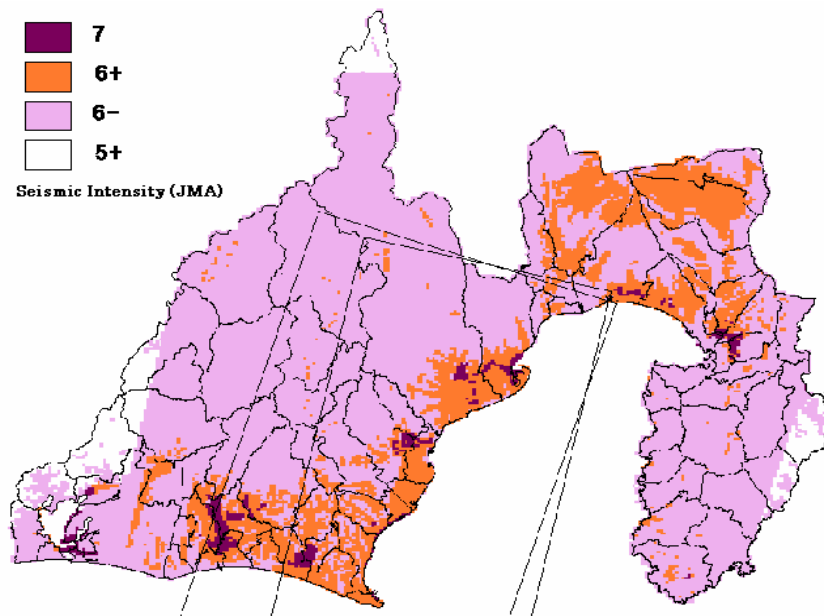


Fig.1 The seismic intensity map of the Tokai Earthquake, simulated by Shizuoka prefecture. This seismic intensity is JMA scale.

THE REGIONAL DISASTER HAZARD INFORMATION DISCLOSURE

Examples of information provided

Information about geology and ground

In order to perform safe land planning and use, a grasp of the information about underground geology is desired. A structure by which geology drilling data etc. can be utilized as social share resource. In Shizuoka Prefecture, we collected the geological drilling data of about 18,000 sites. Based on this drilling data we created a surface geologic map (1/50,000), liquefaction risk map (500 meters mesh map), a surface geology sectional view (an alluvial plain is cut to about a 2km grid east-west and north-south), etc.

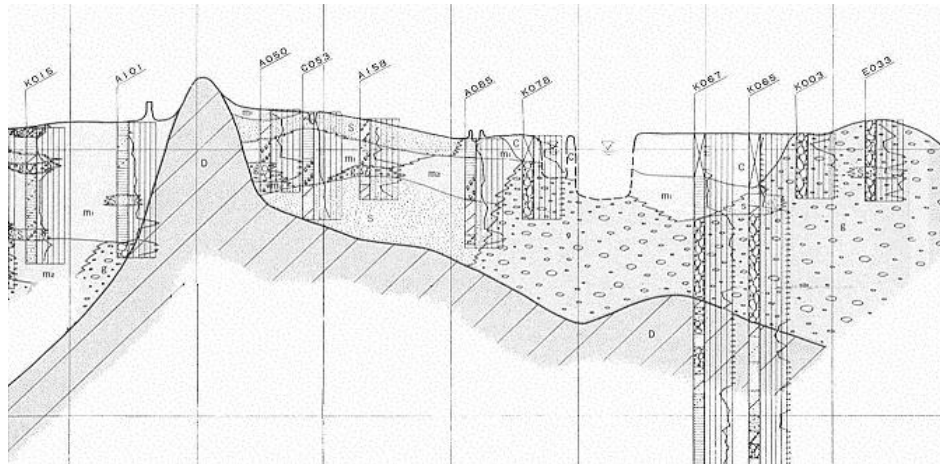


Fig.2 An example of a geology section (the original drawing is 1/50,000). We can read the form of the ground basement, the depth or the thickness of soft ground, etc.

Disaster hazard map, such as tsunami and landslide

The Tokai Earthquake focal region spreads directly under the Suruga Bay. Therefore, if an earthquake occurs, the 1st wave of tsunami will reach the coast after several minutes. Moreover, a large-scale landslide is also generated simultaneously with the occurrence of an earthquake. The risk of disaster by tsunami or landslide needs to be well-known to residents. For this reason, in Shizuoka Prefecture, we created the tsunami flood prediction map and the landslide risk anticipation map. Based on these maps, a disaster prevention map for residents is created in each city and town and they tell residents information such as high risk areas, refuge grounds, refuge routes, etc.

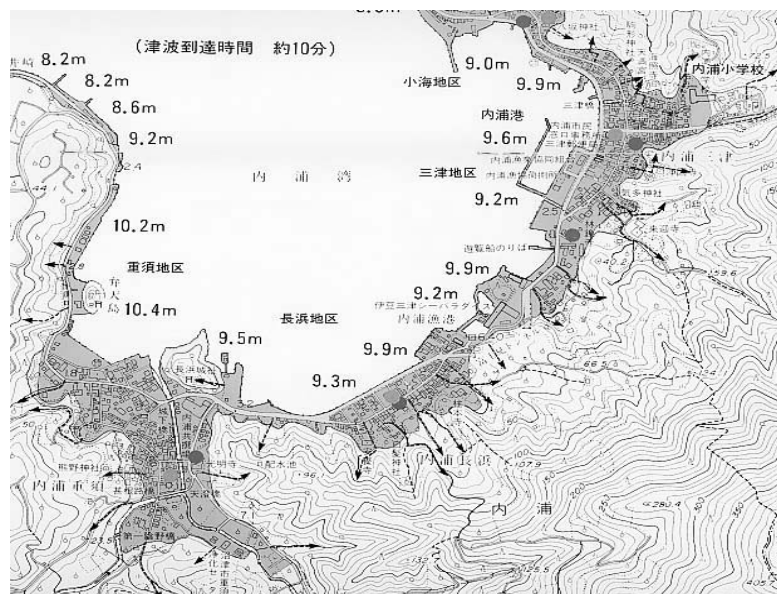


Fig.3 Disaster prevention map created by Numazu-City. The tsunami flood anticipation area, a refuge route, a refuge area etc. are described. The filled-in number expresses anticipated tsunami height (unit : m).

The distribution map of artificial land development

As the development of a large-scale housing complex and industrial complex progressed in the suburbs, the hill ground was developed and the swamp belt was reclaimed. For this reason, new disaster dangers arise. When long years pass, it becomes impossible to envision the original situation, although we can also perform disaster measures if we understand the geographical features before developing a residential area. We analyzed the old aerial photograph etc. and created distribution maps of artificial land developed for housing lots. From this map, we can know information such as old geographical features, the thickness of landfill sites and cases of swamp belt reclamation.

PRACTICAL USE OF DISASTER PREVENTION MAP

Example of disaster prevention drill

In Shizuoka Prefecture, we are overseeing DIG(Disaster Imagination Game) drills performed using the disaster prevention map so that it may be undertaken in each district. Through this drill, residents can check themselves on the map where the disaster hazards lie, and where the residents who will need assistance live. Moreover, residents discuss concrete action for when a disaster occurs, and can refer to the disaster prevention map.



Photo.1 A scene during DIG, a disaster prevention drill performed on the disaster prevention map carried out by an independent disaster prevention organization.

New means for disaster prevention information provision

By using the Internet, it became possible to offer various kinds of disaster prevention information. In Shizuoka Prefecture, the "Shizuoka Disaster Prevention Information Internet GIS" was built in Jun.2001. In addition, we offered the result of damage assessments and information about earthquake disaster prevention etc. The homepage address is <http://www.pref.shizuoka.jp/bousai/>.

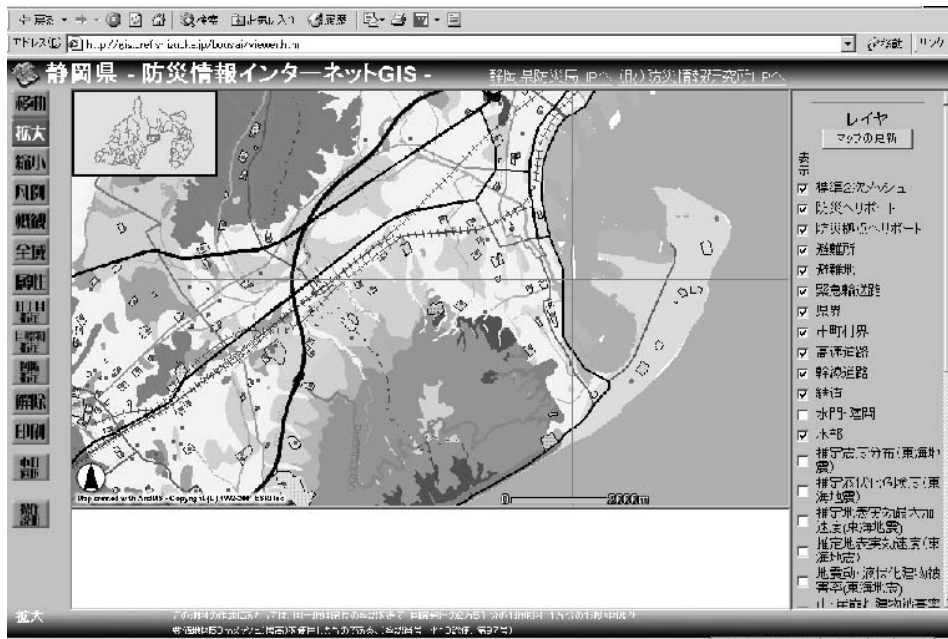


Fig.4 Screen shot of the Shizuoka Disaster Prevention Information Internet GIS. This example displays surface geology, disaster prevention bases and a refuge ground etc.

REFERENCES

- Iwata,T. (1999). "Earthquake disaster measures of Shizuoka Prefecture." *Symposium for Citizens by the Japanese Geotechnical Society, "The ground and the disaster of Shizuoka"* , 17-31.
- Shizuoka Prefectural Government, (2002). The result of 3rd assessment for the Tokai Earthquake disaster, *Publications, Government office of Shizuoka Prefecture, Japan.*
- Iwata, T. (2003). "Information concerning the assessment of an earthquake disaster in Shizuoka prefecture." *Tsuchi-to-Kiso, The Japanese Geotechnical Society*, Vol. 51, No.10, Ser.No.549,11-14.

(Submitted: April 1, 2004)
 (Accepted: June 22, 2004)
 Copyright JAEE