

Estimation of the subsurface structure around damaged areas due to the 1909 Anegawa Earthquake using gravity survey

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1. Introduction

The 1909 Anegawa Earthquake brought the severe damage to the eastern area of Lake Biwa, Japan. In this earthquake, it is reported that the

obvious anomaly distribution of the damage (Nakamura, 1909). To discuss the cause of this type of anomaly distribution, we will estimate the bedrock structure around this area through the gravity survey.

2. Observations

We used the auto gravity meter CG-3M (Schintrex) and Pro-Mark X-CM (Magellan) to determine the exact position of an observation site. The observation is carried out at 110 sites and they are placed with 250 to 500-meter intervals.

3. Analysis and Results

To determine the density of the bedrock, we use two methods: the one is that the density of some samples is measured directly and the other is

G-H correlation method (Rikitake et al., 1964). From these methods, we assume 2.42 t/m³ as the density of the bedrock. Furthermore, we assume

1.99 t/m³ as the density of sediments and estimate the bedrock structure applying the three-dimensional analysis to the Bouguer anomaly. From the estimated bedrock structure, there is a flat area with deep dips in the

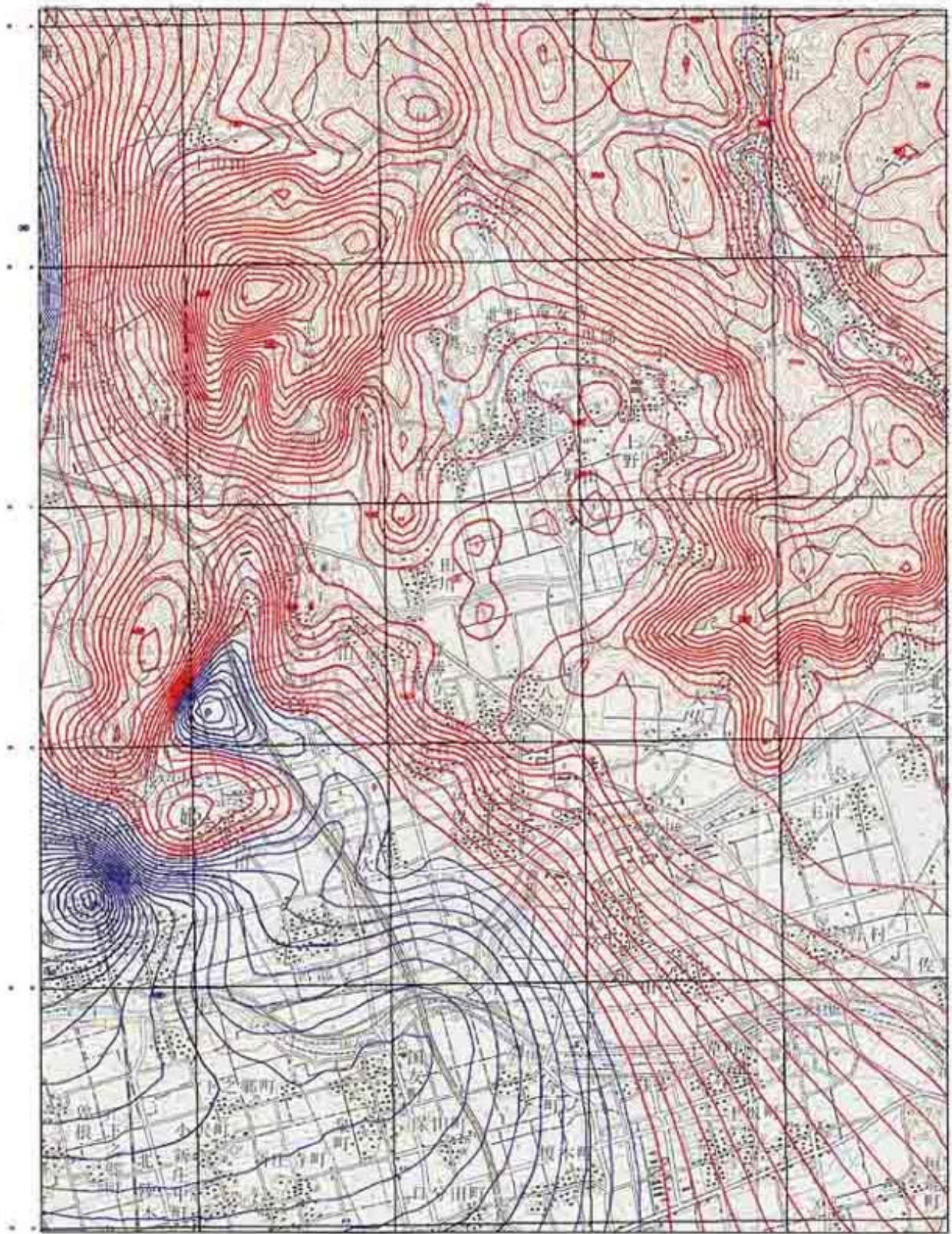
north-eastern area and steep slope with NE-SW direction. The depth to the bedrock is up to 350 m at south-western area. It should be noted that

these dips and slopes seem to correspond to the severely damaged area.

4. Future Developments

On the basis of the bedrock structure estimated through the Bouguer anomaly, it is observed that some typical features regarding to the

relationships between the damaged area and bedrock structure. To confirm this, we will examine the wave fields by earthquake through the numerical analysis and so on in the near future.



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