

Quick damage survey after the 2011 off the coast of
Fukushima Earthquake (M 7.3)

Takashi KIYOTA, Masataka SHIGA
Institute of Industrial Science, University of Tokyo

Survey area (16th Feb., three days after the earthquake)



Shirakawa-Inusotoba, Shiroishi City



Slope failure (12m wide) on the right bank of the Takada River.

The retaining wall of the road embankment and river protection wall collapsed

Midorigaoka, Shiroishi City

2011 Tohoku EQ



- A residential area developed by earth work. The area suffered from significant damage due to the 2011 Tohoku earthquake.

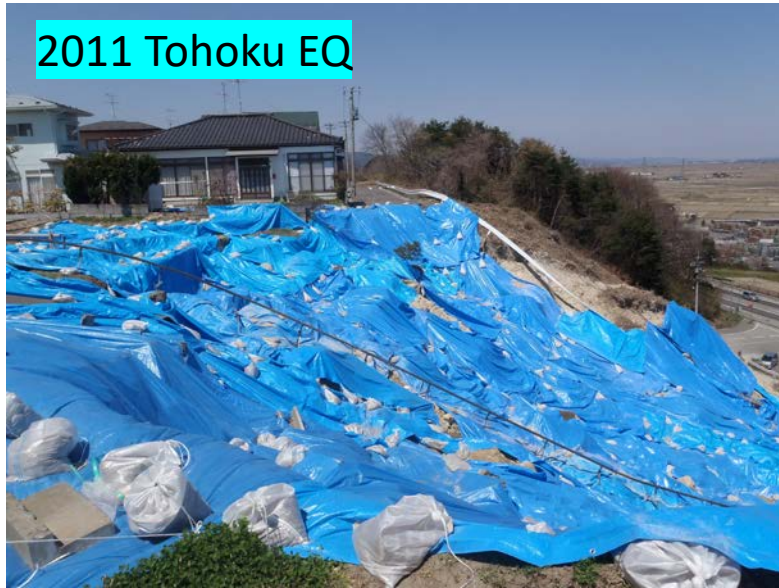
2021 EQ



No significant ground deformation or building damage was observed during the survey after the 2021 earthquake.

Taiyo-newtown, Yamamoto Town

2011 Tohoku EQ



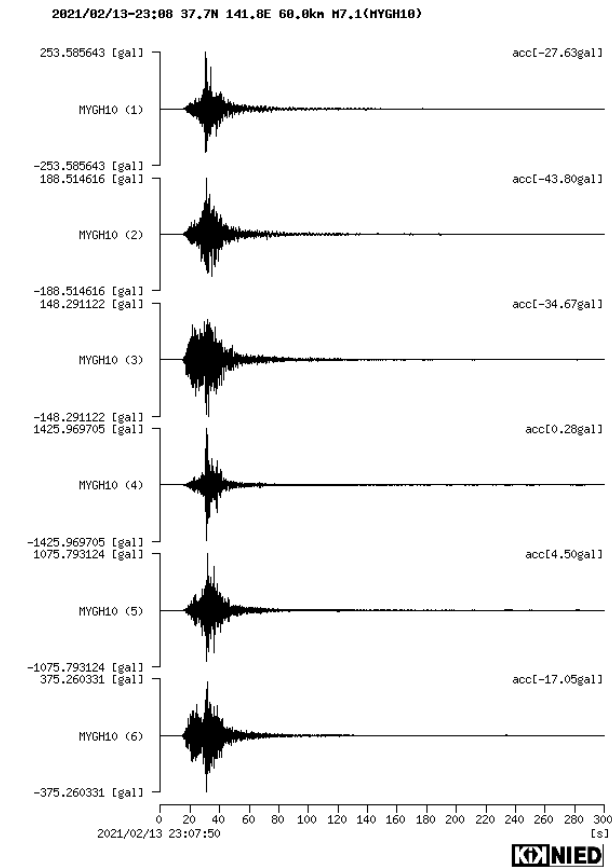
A residential area developed by earth work. The filled parts suffered from significant damage due to the 2011 Tohoku earthquake.

2021 EQ



Similar to Midorigaoka, no significant ground deformation or building damage occurred due to the 2021 earthquake.

Strong motion station, Yamamoto Town (NIED, MYGH10)



- An acceleration of 1,426 gal, the highest recorded value for this earthquake.
- The observation shed was set up on a 50cm embankment

Miyagi hospital, Yamamoto Town



- Damage to the expansion joint and cracks in the second floor exterior
- Detachment of concrete cover and exposure of reinforcing steel on columns at the north end of the two-story-building
- Moving the temporary hut.

Nakahama elementary school, ruin of the 2011 Tohoku earthquake



- No significant damage
- Uplift of buried tank (or settlement of surrounding ground) was observed.

Manager of ruin talks

- The tremor felt bigger than the 2011 Tohoku earthquake.
- In 2011, many people stayed in their homes due to the small tremors, and as a result they were caught up in the tsunami.

Sakamoto branch office, Yamamoto Town



- The branch office opened in February 2015 and was built on reclaimed land that was once paddy field (see next page).
- Damage to block paving due to ground subsidence around the building. Liquefaction-induced sand ejecta was also confirmed.
- Cracks were found in the road and residential property in the reclaimed land.

Sakamoto branch office, Yamamoto Town

Jan. 2009



Feb. 2021



Isohama fishing port, Yamamoto Town and embankment in Shinchi Town

Isohama FP



Sunakodagawa



- Overall, damage to fishing ports and coastal facilities was minor.
- Lateral movement of the quay was observed at Isohama fishing port.
- Gaps in the protective blocks due to the settlement of embankment slope (Sunakodagawa).

Soma Port, Soma City



- At Soma Port, the quay walls were slightly inclined towards the sea.
- Subsidence and cracking of the ground behind the quay walls, as well as sand ejecta due to liquefaction, were observed.

South end of Utagawa Bridge, Soma City



Shimazaki FP, Ukedo FP and Tomioka FP

Shimazaki FP



Tomioka FP



Ukedo FP



- Minor damages to the fishing port facilities (crack on the pavement, small movement of quay walls and small settlement around the building).