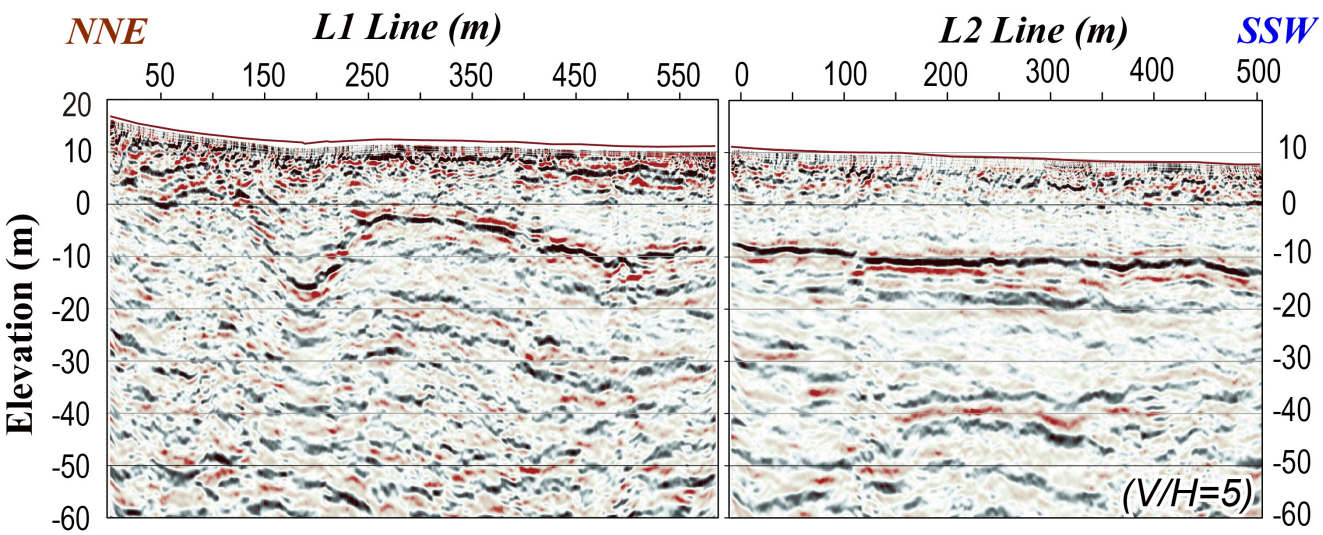
Imaging of near surface structure beneath a coastal plain by means of high-resolution S-wave seismic reflection survey

*Tomio INAZAKI[1], Kyoko Kagohara[2], Shinsuke Okada[3], Takayuki Nakano[4], Nobuhisa Matta[5]

1. Research Institute of Geology and Geoinformation, AIST, 2. Yamaguchi Univ., 3. Iwate Univ., 4. GSI, 5. Okayama Univ.

We conducted a high-resolution S-wave seismic reflection survey to delineate the near surface structure beneath a beach ridge plain facing Ensyu-nada, Ohbuchi District, Kakegawa City, Sizuoka Prefecture. The field survey was carried out in August to September 2020 along a total of 1.1 km long survey lines set on a road extending from the foot of Ogasa-yama Hills to the shoreline. We adopted an S-wave type Landstreamer, consisted of a total of 96 channel, 14 Hz horizontal geophone units at 50 cm intervals mounted on stainless wires, as the survey tool. Horizontal hitting of wooden plank was employed to generate a polarized SH-wave impulsive signal. Total shotpoints and recorded files amounted to 1,084 and 3780 respectively. All the shot records were visually inspected to eliminate miss-triggered records and dead traces, and to estimate shot statics before applying diversity stack. Migrated time sections were reconstructed through the ordinary processing flow with iterative velocity analyses and statics. Finally, we obtained migrated depth sections along the survey lines based on the NMO RMS velocity and on time to depth conversion curves estimated from an empirical relationship between S-wave velocities and geotechnical data.
A clear event was delineated at about -10 m in altitude, or 20 m in depth. The reflector showed flat structure beneath the coastal side line, and gradually ascended towards the hill side. In addition, it formed a small buried valley near the foot of the hills. Reflectors having similar trends were also traced at depths but not so clear. Boring and VSP are being planned to obtain core sample and direct S-wave velocity profile of the near surfaces.

Keywords: S-waves, seismic reflection survey, Land Streamer, beach ridge plain, Kakegawa City



©2021. Japan Geoscience Union. All Right Reserved.