

Average S-wave velocity mapping at Morioka area by using conventional microtremor array technique

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The microtremor array survey was a method for estimating S-wave profiles by using the dispersion curve of surface waves from array records of microtremors. This study tries to determine average S-wave velocity distribution in the shortest possible time to using easy and conventional observation and analysis techniques. For estimating Rayleigh dispersion curves, microtremor observations at the 29 sites of Morioka area were carried out using a small array. Vertical microtremors were measured using a small array with a radius of 6 m for estimating an average velocity of S-wave at depths from surface to 30 m. Four velocity sensors LE-3D/1S with a natural period of 1 s were used. A data-logger LS-8000SH was used. A sampling period was 5 ms. A recording time was about 20 minutes. A spatial auto-correlation (SPAC) method was used for estimating phase velocities. Average S-wave velocities (AVS) at Morioka area were converted from the dispersion curves based on a conventional method proposed by Nagao and Konno (2002). The AVS estimated from Rayleigh dispersions curves of our previous microtremor array studies were added to data sets. The results were as follows. As compare with AVS distribution with surface geological map, the AVS at the northwest area where the pyroclastic material was distributed were small, those at the northeast or central area where the basement rock was distributed were large, and those at the south area where the diluvial sand and gravel was distributed were also large. As compare to AVS distribution with seismic intensity distribution, the AVS at the area where seismic intensity was large were small, and those at the area where the seismic intensity was small were large.