# Reexamination in northern Haramachi Segment of Futaba Fault delineation and its activity

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Large crustal deformations have occurred in the Northeast Japan arc due to the earthquake off the Pacific coast of Tohoku ($M_w$ 9.0) on March 11, 2011. Along with this massive earthquake occurred in the Japan Trench, the stress field in the Northeast Japan arc is known to be rapidly changed (Toda, 2011). Futaba Fault Zone, distributed in the forearc region of Northeastern Japan arc along the eastern margin of the Abukuma Mountains that has a left-lateral strike slip fault with the western uplift component with NNW-SSE trend (HERP, 2005), becomes one of the fault that should be reexamined in order to understand its recent activity corresponding the stress field changes theory.

In this study, we focus on the area around Souma City to Hatsuno region in Fukushima Prefecture which is the location of the northern Haramachi segment of Futaba Fault that is lacking detail investigation from the previous study. Haramachi segment has been positively interpreted as an active part of the segment of Futaba Fault Zone from the fault scarp evidence. Fukushima-ken (1998) carried out a number of pit, trench survey, and boring survey in Tochikubo region and estimated the most recent event on the Haramachi Segment fault occurred at 2200-1900 y.B.P, as determined by carbon-14 dating. They also identified that the total amount of displacement in one earthquake is about 1.5 m resulting in an estimation of 0.15 - 0.25 m / 1000 years average slip rate. Based on the recent research of subsurface study, Okada et al (2017) revealed that there is a concealed fault under the Sendai Plain which could be the extension of the northern Futaba Fault zone.

We examined the detail distribution and geometric features of active faults in the northern part of Haramachi segment using 2m-mesh and 5m-mesh digital elevation model (DEM) data, topographic anaglyph image, and conducted field investigation to check the correlation of the terrace surfaces. Geomorphic features such as deformed terrace risers, linear valleys, deflected drainages, and small fault scarps can be identified. Uda River region shows evidence of strike-slip faulting movement from terrace displacement. The active faulting evidence could be observed from the deformation of lower terrace (L2) surface. Several new fault strands are also identified in this study. From this examination, we have a new estimation the total length of Haramachi segment, that is, about 25 km. In order to understand further about fault activity, we will conduct boring survey on the terrace surface (L2), which we interpreted to be displaced by recent faulting of Futaba Fault, to collect the wood material suitable for radiocarbon dating.

Keywords: Active Fault, Strike-Slip Fault, Futaba Fault

 