

High resolution seismic surveys in the Kuril trench off Hokkaido

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In the Kuril trench subduction zone, several large earthquakes (e.g., Tokachi-oki earthquakes) have occurred, which caused the earthquake and tsunami hazards in the Hokkaido and Tohoku region. Because the earthquake and tsunami risk was evaluated to be high in this region, more investigation and studies are required to contribute to the mitigation of those risks. In 2016 and 2018, we conducted high resolution seismic surveys in the Kuril trench from Erimo Seamount to off Kushiro by R/V *Yokosuka*. Approximately 35 km long 24 seismic profiles with ~ 6 km line separation were acquired using a 1.2 km long streamer cable and 380 inch³ cluster guns. Obtained profiles demonstrate the detailed geological structure in the trench axis region. Subducting Pacific plate is deformed by the bend-related normal faults. The throw of the faults is up to ~ 300 –400 ms TWT. The thickness of the incoming sediments is > 500 ms maximum in the survey area and becomes thinner near the seamounts. Thick trench-fill sediment is deposited in the trench axis west of the Kushiro canyon, and the thickness is up to ~ 800 ms. Some profiles show weak landward dipping reflections within the hanging wall sediments. Possible slope failure is suggested in the lowermost landward slope near the Erimo Seamount.

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