# Fluids in the subducting crust: Inferred from estimation of the seismic velocity structure

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The subducting crust carries a lot of fluids into subduction zones as a form of hydrous minerals. Break down of the hydrous minerals and released fluids are considered to be related genesis of intermediate-depth earthquakes and arc magmatism (e.g., Kirby et al., 1996; Nakajima et al., 2013). Because the hydrous minerals and existence of the fluids lower seismic velocity, revealing detailed structure of the crust is important to understand ongoing processes in the subduction zones.

In the eastern part of Hokkaido, northern Japan, guided-P and guided-S waves are often observed. The waves are considered to propagate in the subducting crust. We picked arrival times of the guided waves and estimated P- and S-wave velocities in the crust.

The estimated P- and S-wave velocities in the subducting crust are 6.5-7.5 km/s and 3.6-4.2 km/s at depths of 50-100 km, respectively. Moreover, the velocities at depths shallower than 80 km are markedly lower than those expected from fully-hydrated MORB materials (P-wave velocity of ~7.4 km/s; e.g., Hacker et al., 2003). This velocity reduction is consistent with that in northeastern Japan (Shiina et al., 2013) and suggests the existence of aqueous fluids of 1 vol% in the crust at depths of 50-80 km beneath the eastern part of Hokkaido.