

Understanding the structure of subducting plates

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Seismic studies are helping scientists learn more about the structure of subducting oceanic plates.

Using an airgun array and 80 [ocean bottom](#) seismometers spaced along a 500 kilometer (310 mile) profile, Fujie et al. conducted a seismic reflection and refraction survey at the Kuril trench in the northwestern Pacific margin, where part of the Pacific plate is subducting beneath the Okhotsk plate.

They estimate the water content of the subducting plate by measuring the velocity of seismic waves—both P waves and S waves—through the plate. The $V_{sub\ p} / V_{sub\ s}$ ratio is an indicator of the lithology, porosity, and presence of fluid in the plate.

Their findings show that the water content in the plate increased toward the trench, along with greater bending and fracturing, suggesting that water enters the plate through the fractures.

The authors conclude that the bending and fracturing of the plate as it subducts plays an important role in the water cycle in [subduction zones](#).

More information: Systematic changes in the incoming plate structure at the Kuril trench, *Geophysical Research Letters*, [doi: 10.1029/2012GL054340](#), 2013 [onlinelibrary.wiley.com/doi/10.1029/2012GL054340/abstract](#)

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