

In the Cascadia subduction zone, the location and physical properties of the subducting plate interface are poorly understood due to sparse seismicity. In July 2012, the R/V Langseth COAST cruise acquired 9 seismic reflection profiles across the locked, seismogenic portion of the Cascadia subduction zone. Initial post-stack time migration processing shows only sparse hints of reflectivity from the top of the down-going slab below complex structures of the closely-spaced folds within the accretionary prism and the mélange-and-broken formation (MBF) of the older prism. The weak reflectivity at depth may indicate low impedance at the plate boundary beneath the MBF, possibly with little fluid or subduction channel present. However, pre-stack data including CDP gathers reveal strong reflectivity from the plate interface down to ~15 km depth. Slab reflectivity is present from seaward of the trench, where it is continuous in gathers and in stacks, to beneath the shelf, where it is observed in gathers. Reflectivity from the deeper slab is discontinuous, even in gathers, and appears to be strongly influenced by scattering above the slab. We will use enhanced multiple removal techniques and prestack depth migration to image the deep reflectivity, with the ultimate goal of better understanding slab structure and plate interface properties of the Juan de Fuca plate within the seismogenic zone.