185-11 - NEW HIGH-PRECISION GEOCHRONOLOGY OF THE CENOZOIC SEDIMENTARY PERIPHERAL ROCK SEQUENCE, NORTHERN OLYMPIC PENINSULA, WA: IMPLICATIONS FOR BASIN FORMATION FOLLOWING OCEANIC PLATEAU COLLISION

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Abstract

The Eocene-Miocene sedimentary and volcanic rocks that comprise the northern periphery of the Olympic Peninsula WA are divided into two distinct sections by the Lower Elwha fault. The hanging wall is composed of ~50-51 Ma basalts related to Siletzia, a ridge-centered oceanic plateau that collided with North America at ~50 Ma, and overlying sedimentary rock. The footwall contains Eocene-Miocene sedimentary strata of the Tofino-Juan de Fuca basin. Despite previous research, stratigraphic uncertainty remains in regional correlations of Eocene units across this major structure on the northern Olympic Peninsula.

Recent U-Pb zircon geochronology has indicated that the stratigraphically lowest part of the Tofino-Juan de Fuca basin is <45 Ma and postdates Siletzia's accretion to North America. We present a new suite of detrital zircon geochronology (N=10, n=2360) from these rocks and integrate results with new and existing sedimentologic observations. These data suggest that continentally-derived sediment (Blue Mountain Unit; BMU) flooded the basin immediately prior to and following (Aldwell Fm.) a major period of basaltic volcanism (lower Crescent Fm.). We interpret the BMU to represent a period of marginal rifting that occurred <10 Myr after Siletzia's accretion. The BMU is overlain by fine-grained, deep-water deposits of the Aldwell Fm., which has a zircon age spectra characteristic of southern Vancouver Island and the Coast Mountain Batholith (CMB). Following Aldwell deposition, there is an influx of boulder-cobble conglomerates (Lyre Fm.) into this deep-water setting, which is likely tectonically driven. A significant change in provenance then appears in the overlying Hoko River Fm., with a unimodal peak age population of 51-53 Ma. The zircon age spectra become more characteristic of the southern CMB and southern Vancouver Island once again in the overlying late Eocene to early Oligocene Makah Fm.

High-precision U-Pb zircon geochronology of interbedded volcanic rocks is ongoing and will provide more precise depositional ages for this sequence. We discuss the significance of marginal rifting and the changing provenance of Eocene sedimentary rocks in the Tofino-Juan de Fuca basin within the context of migrating triple-junctions and the possible northward translation of the Yakutat terrane during this time.

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