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Presentation Time: 9:00 AM-1:00 PM

JURASSIC AND PALEOGENE FAULTING IN THE EASTON NAPPE OF THE WESTERN NORTHWEST CASCADES THRUST SYSTEM OF WASHINGTON

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Subduction accretion complexes undergo prolonged and polyphase deformation that results in complex contact relationships between exhumed litho-tectonic units and different protoliths. The Northwest Cascades Thrust System in Washington and British Columbia is a composite nappe sequence of accreted terranes that experienced >55 million years of subduction and accretion. While the overall structure of the nappe sequence and the relative timing of nappe emplacement are well constrained, different structural interpretations exist based on the affinity of metamorphosed mafic plutonic and volcanic rocks with variable (MORB and island arc) chemistry that occur near the boundary between the Easton and Haystack nappes. One model places the mafic protoliths within the Easton nappe that were incorporated during pre- or syn-subduction faulting in the Jurassic, while an alternative model places the mafic protoliths within the overlying Haystack nappe that was faulted against the Easton nappe during the Paleogene.

Our mapping, structural analysis, geochronology and geochemistry focus on the origin and tectonic history of the nappes in the southwestern Northwest Cascades Thrust System. Building on earlier mapping, we recognize steeply dipping sheared contacts between mafic rocks and semischist and phyllite of the Easton nappe. Foliation in the Easton units is parallel to narrow mylonitic zones in the adjacent mafic rocks. The mylonitic fabric in mafic rocks contains white mica and chlorite and appears to correlate with S2 in Easton semischist. The latter was dated as ≥140 Ma by previous work in other parts of the Easton nappe, suggesting that the mafic igneous rocks were incorporated into the Easton before or during subduction. Mapped contacts that cross-cut foliation in Easton rocks are interpreted as younger, likely Paleogene or Neogene faults. These faults are typically steeply dipping and locally involve Eocene units. Gently dipping contacts at the base of the Haystack nappe not are not observed in the study area, implying the boundary between the two nappes is located further to the south. Geochronology and geochemistry work are in progress to determine the origin and age of the mafic units protolith and the age of structural fabrics in the region.

Session No. 163--Booth# 126

T9. Late Cretaceous–Eocene (pre-Cascadia) Tectonics from the Greater Pacific Northwest Margin to the Rocky Mountains (Posters)
Tuesday, 12 October 2021: 9:00 AM-1:00 PM

Exhibit Hall A (Oregon Convention Center)

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