Development of the Selwyn Range Shear Zone in relation to middle Miette facies change

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The Selwyn Range comprises part of the Western Main Ranges of the Southern Canadian Rocky Mountains. The region is dominated by the doubly-plunging Fraser River Antiform that exposes the deepest structural and stratigraphic levels of the foreland fold and thrust belt. The mountain belt is underlain by the Hadrynian Miette Group turbidite dominated sequence. The Old Fort Point Formation forms a prominent marker unit in the conglomerate dominated middle Miette Group. Regional mapping of the OFP allows definition of a prominent facies change occurs in the middle Miette Group, represented by a westward transition from a conglomerate to shale dominated sequence.

The west flank of the Fraser River Antiform has developed a prominent deformed zone referred to as the Selwyn Range Shear Zone. The shear zone is developed in dominantly politic strata of the middle Miette Group and is overlain by a train of open symmetric folds with a total shortening of ~ 20%. This zone is characterised by progressive development of finite strain over 50 m of stratigraphic section to a maximum and then decreasing over another 50 m. The importance of this deformation has been debated and several widely varying models have been proposed to explain this feature. Fabrics associated with the shear zone suggests that it is related to interlimb slip on the developing Fraser River Antiform. The intense deformation on the west flank is largely related to the prominent facies change from more competent conglomerate dominated middle Miette Group in the east to less competent pelites in the west. This implies the shear zone is not associated with any significant movement or shortening in the western Main Ranges.