The Puyallup River, White River, and Carbon River drain and transport sediment from the glaciers of Mt. Rainier down to the waters of Commencement Bay. Landscapes around the Puyallup River Watershed are changing, affecting the composition of sediment carried by these rivers. This study aimed to determine whether silt in the Puyallup River Watershed could be traced back to its origination point by analyzing its modal mineralogy. We conducted mineral counts on summer bed silt samples from the Puyallup River, White River, and South Prairie Creek to determine the relative abundances of major categories of rock-forming minerals, inclusions in those minerals, and volcanic glass. Our results demonstrated subtle differences between the three sample locations: silt from the Puyallup River contained equal fractions of feldspar and mafic minerals, while the White River and South Prairie Creek samples contained a majority of mafic minerals. Compositions of the White River and South Prairie Creek silt samples were similar to each other. The subtle differences found in these results suggest a method to differentiate between sources of silt throughout the watershed. However, more data from suspended sediment samples in these locations, additional bed sediment samples in these rivers, and samples taken closer to the glaciers of origin are required to obtain a more complete analysis.