

RESEARCH ABSTRACT

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Study Title: Stream channel adjustments in the Smith - Muddy River drainage after the 1980 Mount St. Helens eruptions

Key Words: geology geomorphology streams erosion
watershed sedimentation blowdown zone ashfall zone archives

Abstract: Stream channel response to the 1980 eruption of Mount St. Helens has varied widely. Stream channels that received only airfall deposits have shown no significant sedimentation following the eruption. In drainage basins that received both blast and airfall deposits, localized channel modification has been observed. However, as the blast/airfall deposits are predominately sand-sized, they have been quickly removed from the steep low-order channels surrounding the mountain with little net effect on pre-eruption channel morphology. Some subsequent channel modification has resulted in lowered gradient reaches downstream as sediment eroded from upstream hill slopes and stream channels has been redeposited in these reaches. Long-term effects in blast/airfall affected streams appear limited to channels subjected to debris torrents resulting from shallow-seated landsliding and breakup of in-channel debris jams.

Large woody debris maintains channel complexity in channels inundated with sediment. Friction provided by debris on channels and flood plains promotes deposition of fine-grained sediment on flood plains. Large pieces induce scour of pools and exposure of gravelly substrate and commonly protect banks from erosion.

Type of Measurement(s): Monumented cross sections and longitudinal profiles; residual depths of pools; pebble counts; photos from monuments.

Frequency of Measurement(s): Bi-annually, 1980 to present.

Data Storage: Field notebooks and computer files in Data General at U.S.F.S. Redwood Sciences Lab.

Long-term plans: Data available for collaborative efforts: This study is ongoing. Lisle plans to publish ten

year results soon. He is open to collaboration that seeks basic data on stream channel changes.