

RESEARCH ABSTRACT

Principal Investigator(s):

Jerry Franklin
College of Forest Resources
Univ. of Washington
Seattle, WA 98195
(206) 543-2138

Peter Frenzen
USDA Forest Service
Mount St. Helens NVM
42218 NE Yale Bridge Road
Amboy, WA 98601
(360) 449-3935

Study Title: Natural revegetation of debris avalanche and lahar (mudflow) deposits

Key Words: terrestrial plant vegetation succession mudflow
lahar trees shrubs herbs grasses
blowdown zone recovery debris avalanche archives

Abstract: Natural revegetation was studied on debris avalanche and mudflow deposits primarily northwest and southeast of Mount St. Helens on Forest Service land. Objectives were: 1) examine patterns of revegetation in response to large and small scale surface changes as deposits are modified by geomorphic processes; 2) characterize revegetation on different types of sites in the devastated area (North Fork Toutle River debris avalanche and Muddy River mudflow) and 3) establish a system of documented permanent plots to track ecosystem recovery and describe important processes through time.

The basic sampling unit was a series of transects that cross the deposit from valley wall to valley wall. A series of 250 square meter circular plots were placed at 50 meter intervals along the transect line. Total number of plots per transect is, thus, determined by total length of transect.

Results indicate that a number of factors contribute to the composition and abundance of vegetation following the eruption. These include degree of initial disturbance (scouring, deposit depth and presence/absence of pre-eruption soil and plant material on the deposit surface following the eruption); degree of subsequent modification of deposits (erosion and/or deposition of material); substrate composition and availability of surface moisture.

Type of Measurement(s):

- Composition and ground cover recorded to nearest 0.01 square meter for all vascular plants. Beginning in 1991 species cover was recorded using a modified Daubenmire cover class and cover on microplots to nearest percent.
- Composition, cover and number of seedlings recorded on eight, two meter square subplots within each plot.
- Plant cover and density was estimated using two 16 meter long line intercept transects that bisect each plot along the north/south and east/west microplot radii.
- Small scale surface features (stream channels, terraces, mounds, logs, erosion gullies) were mapped on each plot in 1983 and 1984.

Frequency of Measurement(s): Annual measurements at period of peak phytomass (late July to end of August) conducted 1980-1984, 1986 and 1989 and a sub-sample of plots in 1990 and 1991.

Data Storage: Field notes are stored at the USFS Forestry Sciences Laboratory, Corvallis, OR with copies stored at the College of Forest Resources, Univ. Washington.

Electronic data (IBM compatible ASCII files) and accompanying documentation are stored in the Forest Science Databank at Oregon State Univ. with copies at Univ. Washington (Dr. J. Franklin) and in the Monument Scientist's office, Mount St. Helens National Volcanic Monument, Amboy, WA.

Long-term plans: Data available for collaborative efforts: Transects are permanently marked with steel reinforcing bar at plot centers (centers were originally marked with white plastic PVC pipe although many are missing). Endpoints are located on adjacent hill slopes (off-deposit), marked with steel fence posts and referenced by three blazed bearing trees or large stumps (in case of pre-eruption clearcuts).

Transect locations have been fixed using a Global Positioning System in 1989 (locations on file at the Monument Scientist's office, Headquarters, Mount St. Helens National Volcanic Monument). Transects will be resurveyed periodically as resources are available; expect remeasurement program to continue at three to five year frequency.

Data are available to bona fide investigators for collaborative research.