

RESEARCH ABSTRACT

Principal Investigator(s):

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Study Title: The effects of the eruptions of Mount St. Helens on glaciers, glacier caves, caves and mudflows, etc.

Key Words: crater geomorphology physical topography hydrologic
caves lahar mudflow glaciers speleobiology
long-term studies

Abstract: The objectives of this project are to study effects of eruptions on glaciers and glacier pseudokarst and to map glacier caves and glacier margin and other caves on Mount St. Helens. In meeting these objectives we will document and photograph (1) these features; (2) effects of ashfall and mudflows on newly exposed glacier bed and downslope detritus and erosion produced by melting glaciers; (3) effects on crater, dome and caves in crater.

Results:

- (1) Map glacier caves, lava caves and put on topographic map with aerial photos.
- (2) Speleobiology of glacier caves: specimens were collected of all species observed. Stoneflies (Plecoptera: Perlodidae) *Rickera sorpta* a penultimate (last stage) nymph of this rare species was found in the Swift Glacier cave. Craneflies (Diptera: Tipulidae) *Ornithodes harrimani* Coquillet; fungus gnats (Diptera: Mycetophilidae) *Boletina* sp.; grylloblattids (Orthoptera: Grylloblattidae); and ice worms (Oligochaeta: Pleiosiopora) *Enchytraeidae* were found in other glacier caves.
- (3) Mudflows were photographed and put on topographic maps.
- (4) Surveys of caves and aerial mapping for topographic maps of cave locations.

Type of Measurement(s):

Survey instruments: Brunton compass & survey tape (feet & meters)
Aerial Photos: Taken by USGS and IGS Members for cave locations and mudflows
Topographic Maps: USGS topo maps & Army Engineer maps & IGS (feet & meters)
Cameras used 35mm, 4 x 5, process camera, Roberson, Opti copy & Durst enlarger

Frequency of Measurement(s): Early 1980 to present & monthly in summer at least once a month.

Data Storage: USGS topo, Army Corps of Engineers maps & IGS files; IGS aerial photo files & NEGS files; IGS maps, files, and cave survey data files.

Long-term plans: Data available for collaborative efforts:

1. Study changes in glacier caves and glacier margin.
2. Map lava & glacier caves.
3. Map & photos of glaciers
4. Study caves in Spirit Lake basin and crater.
5. Study the effects of the eruptions on glaciers and glacier pseudokarst; effects of ashfall and mudflows on newly exposed glacier bed and downslope detritus.

Baseline data is on file for future use.

Future opportunities may include:

1. Master paper on glacier caves on Mount St. Helens
2. Study of glacier caves on an active volcanic mountain.
3. Master paper puts forth a model for the evolution of glacier caves, using observations of glacier cave systems and its environs. No one has treated the evolution of glacier caves systems in detail.