

Specimen records of benthic macroinvertebrate samples collected by Norman H. Anderson in the vicinity of Mount St. Helens, 1980-1990

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Abstract

A private collection of 905 vials containing mostly aquatic macroinvertebrates is presented from Dr. Norman Herbert Anderson, Professor of Entomology at Oregon State University from 1962-1995. The majority of these specimens were collected from multiple freshwater streams during his research at Mount St. Helens (WA, USA) soon after the May 18, 1980 eruption. This collection also includes 15 vials containing specimens collected by Luis A. Fusté from the Muddy River (WA, USA) on March 29, 1980, less than 2 months before the eruption. The vast majority of these vials include a label indicating the sampling location, the date collected, and taxonomic identification.

Introduction

This publication describes aquatic macroinvertebrate samples collected by Dr. Norman H. Anderson between the years of 1980 and 1990. The majority of these specimens were collected from freshwater streams in the area surrounding Mount St. Helens (Lawetlat'la in Cowlitz) after the major eruption in 1980. The eruption caused many streams within the volcanic eruption zone to fill with ash, sediment, and woody debris from the surrounding forest. Most samples with a known location were collected from Ape Creek, Clearwater Creek, or Elk Creek with a small minority originating from lakes surrounding Mount St. Helens. Clearwater Creek is located to the east of Mount St. Helens whereas Elk Creek is located directly to the west, offering some insight into how stream macroinvertebrates in different areas of Mount St. Helens were affected in the aftermath of the eruption. The samples were taken from two months prior to the eruption to up to a decade afterwards.

Historic collections like the ones described here make valuable comparisons to contemporary collections and surveys at Mount St. Helens. For example, surveys in 2016 of twenty-one locations across five new watersheds that have formed on the Pumice Plain, which experienced the most extreme level of disturbance during the 1980 eruption, resulted in collections of over 82 benthic macroinvertebrate taxa, including 74 aquatic insect taxa (Claeson et al. 2021). Primary succession research in stream ecosystems is limited, and assessments of genetic variation for early-establishing taxa may provide valuable information for understanding population dynamics in this ecosystem, as well as patterns of community assembly.

Methods

Approximately half of the vials in this collection are stored in four cardboard boxes (10 inches in length, 5 inches in width, and 1.75 inches in depth). The other half are stored in wooden vial racks (Figure 1).

Each individual vial was carefully viewed. Handwritten information from labels, storage boxes, and wooden racks was recorded in an Excel spreadsheet along with the taxonomic identification for specimens collected. If no taxonomic identification was indicated, insects were identified to the lowest taxonomic level possible using a dissecting microscope along with a variety of dichotomous keys (Merritt et al. 2008, Stewart & Stark 2002, Wiggins 1996, Thorp & Covich 2001) and recorded in a 'Preliminary Identification' column. Great care was used while handling specimens, which were not removed from vials (Figure 2).

After recording each vial's information, an acid-free card-stock label inscribed with a unique 10-digit serial number (with both a visible and machine-readable data matrix 2D barcode) was inserted. The vial was then placed back into the original box or wooden rack.



Figure 1. Some of the 903 vials from the collection of Dr. Norman H. Anderson donated to the Oregon State Arthropod Collection in 2018. Photo by Brandy K. Kamakawiwo'ole

The locations of the sampled sites were determined using Google Earth based on locations either indicated on the box or on individual labels inserted in vials. Approximate GPS coordinates were determined by researching site names and locating the closest road to the site area. Most samples were collected from freshwater streams and tributaries in the vicinity around Mount St. Helens.

Description of the collection

The collection consists of 905 vials of aquatic macroinvertebrates (and a few vertebrates) collected by Dr. Norman Herbert Anderson, Professor of Entomology at

Oregon State University from 1962-1995. The majority of these specimens were collected from freshwater streams in the vicinity of Mount St. Helens (WA, USA) following the May 18, 1980 eruption. The dates range from March 29, 1980 to September 8, 1990. Some of these specimens may be associated with Fusté (1981), Anderson & Hansen (1987), Furnish (1989), Meyerhoff (1991), and Anderson (1992) but we were not always able to make concrete connections.

The collection includes 288 vials from Clearwater and Elk Creeks from 1980-1989 (Figure 3). These vials are shown to be connected to Richard D. Meyerhoff's (1991) dissertation, "Post-eruption recovery and secondary production of grazing insects in two streams near Mt. St. Helens."



Figure 2. Vials containing specimens collected from Mount St. Helens in 1981. Photo by Brandy K. Kamakawiwo'ole.

The collection also includes 90 vials from Ape Canyon, Ape Creek, and Ape Tributary from 1980-1987. These vials are shown to be connected to Anderson's (1992) publication: *Influence of disturbance on insect communities in Pacific Northwest streams*.

Seventeen samples are from Oregon State. Two samples are from the H.J. Andrews Long-term Ecological Research area in Lane County, OR (OSAC_0001220715 and OSAC_0001220730). Thirteen samples are from Benton County, OR from a stream called Berry Creek (OSAC_0001220716 - OSAC_0001220727) and one sample is from Oak Creek in the same county (OSAC_0001220731). One sample is from Crater Lake, OR (OSAC_0001220639). We assumed all other samples were from Skamania County in the vicinity of Mount St. Helens based on labels on boxes.

Four samples are small vertebrates in the families Salmonidae (OSAC_0001220950) and the orders Scorpaeniformes (OSAC_0001220954) and Petromyzontiformes (ammocoete larvae) (OSAC_0001220394 and OSAC_0001220710).

An additional 15 vials containing specimens collected by Luis A. Fusté from the Muddy River (WA, USA) on March 29, 1980, prior to the eruption are included in this collection. These vials may be associated with Fusté's (1981) publication, "Effects of



Figure 3. A well-preserved specimen, *Hexatoma* sp., collected from Elk Creek (WA) in July 1989. Photo by Brandy K. Kamakawiwo'ole

the Mount St. Helens eruption on the benthic fauna of the Toutle River, Muddy River, and Pine Creek drainage basins, Washington.”

Table 1. Specimens collected from Muddy River on March 29, 1980: These vials are connected to Fusté (1981)

OSAC Identifier	Date Collected	Location	Taxa
OSAC_0001220290	3/29/80	Muddy River	Chironomidae
OSAC_0001220291	3/29/80	Muddy River	Ephemeroptera
OSAC_0001220292	3/29/80	Muddy River	Plecoptera
OSAC_0001220293	3/29/80	Muddy River	Ephemeroptera
OSAC_0001220294	3/29/80	Muddy River	Ephemeroptera
OSAC_0001220295	3/29/80	Muddy River	Chironomidae & Ceratopogonidae
OSAC_0001220296	3/29/80	Muddy River	Ephemerellidae
OSAC_0001220297	3/29/80	Muddy River	Plecoptera
OSAC_0001220298	3/29/80	Muddy River	Plecoptera
OSAC_0001220299	3/29/80	Muddy River	Plecoptera
OSAC_0001220300	3/29/80	Muddy River	Baetidae & Ephemerellidae
OSAC_0001220301	3/29/80	Muddy River	Chironomidae
OSAC_0001220302	3/29/80	Muddy River	Plecoptera
OSAC_0001220303	3/29/80	Muddy River	Plecoptera
OSAC_0001220312	3/30/80	Muddy River	Ephemeroptera

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Supplemental File

Supplemental File 1: The entire dataset is provided here as a supplemental file in standard text file format (comma separated values). The dataset contains 905 records (OSAC_0001220100 — OSAC_0001221004). The dataset contains the following 33 fields, as follows:

1. catalogNumber
2. date (dd/mm/yyyy)
3. state (USA: WA or OR)
4. county
5. locality (most samples are from the vicinity around Mount St. Helens),
6. site: specific field locations within locality.
7. replicateNumber: (a replicate number sometimes included on various labels)
8. preservativeStatus (presence of ethanol, yes/no)
- 9—17 Taxonomic information
 9. mixedTaxonDescription: (a description of contents if vial contains multiple taxa)
 10. phylum
 11. class,
 12. subclass,
 13. order,
 14. family,
 15. subfamily
 16. genus,
 17. species,
18. determinedBy: person who originally identified contents of vial
19. mixedTaxonDescription2: (a redetermination of contents if vial contains multiple taxa)
- 20—24. Redeterminations (new determinations made in 2021)
 20. subclass2: redetermined subclass,
 21. order2: redetermined order,
 22. family2: redetermined family,
 23. genus2: redetermined genus,
 24. species2: redetermined species,
25. redeterminedBy: person who re-determined contents of vial,
26. quantity: either an explicit count or an estimate,
27. decimalLatitude (decimal degrees latitude)
28. decimalLongitude (decimal degrees longitude)
29. georeferenceSource: method used to determine latitude/longitude
30. notes: a detailed transcription of all written notes on each label,
31. relevantPublications,
32. boxNumber
33. boxLabel

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