

# Refining Late Pleistocene Tephrostratigraphy in South-Central British Columbia with Evidence of Mount St. Helens Set C Correlations

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Qualitative analysis of various properties of tephra (volcanic ash) from South-Central British Columbia show potential correlations with Mount St. Helens tephra.

- **Purpose:** refine the Late Pleistocene tephrostratigraphy of south-central British Columbia (originally described in Westgate & Fulton, 1975) and test correlations with Mount St. Helens Set C using various stratigraphic, chronologic, and geochemical data (Figure 1).
- **Outcome:** a qualitative analysis of this data suggests several tephra may correlate with Set C, a series of geochemically related tephras erupted between 35,000 and 50,000 yrs. BP (Whitlock *et al.* 2000).
- **Importance:** this work helps support a more robust chronological framework for future studies of Late Pleistocene sediments in the region.

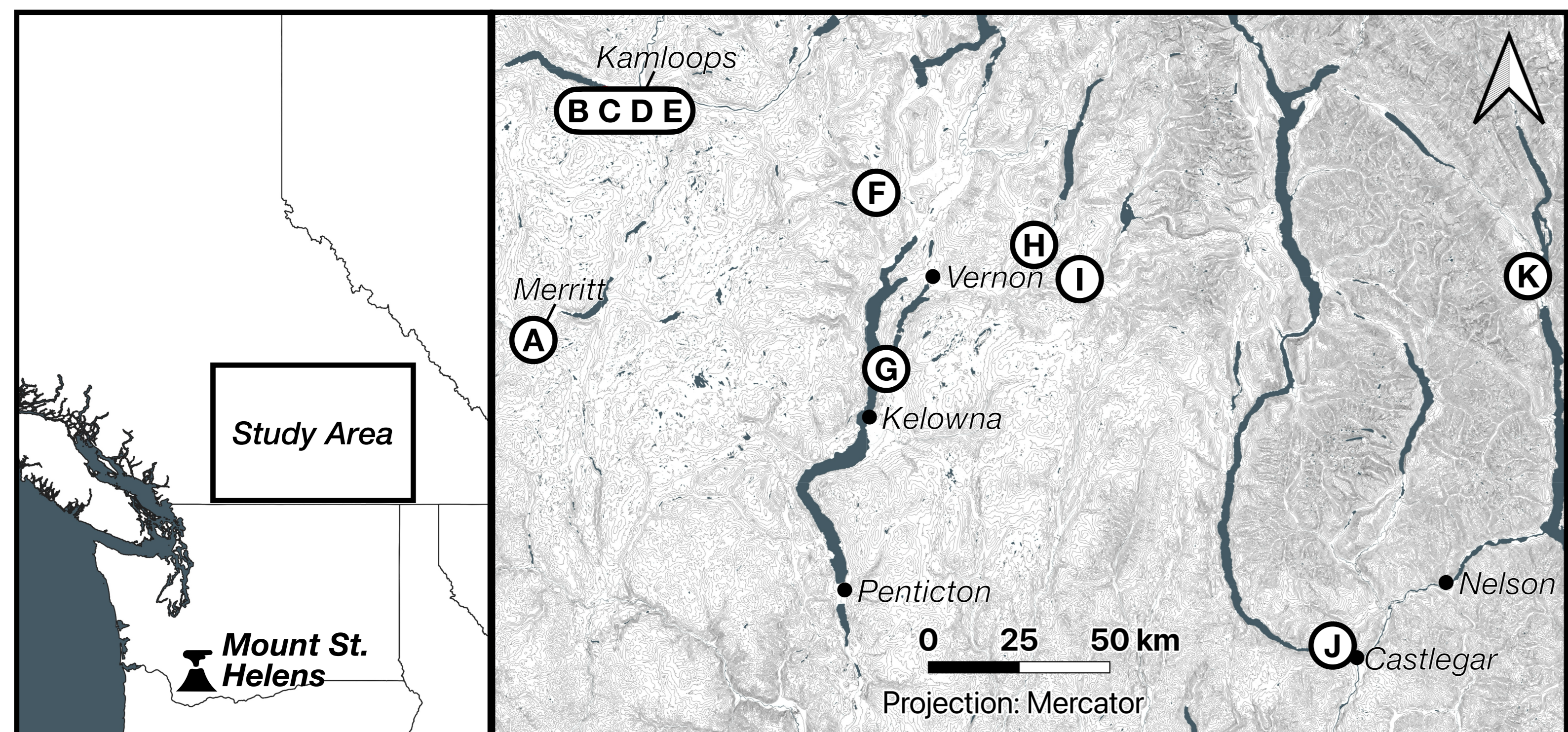


Figure 1: Location of tephra sample sites in South-Central BC from Westgate & Fulton (1975), and location of Mount St. Helens relative to study site. Base map data from Natural Resources Canada (2025).

## Methods

1. Created a data synthesis consolidating geochemical, chronological, and stratigraphic information of relevant tephra.
2. Used this data to produce and evaluate compositional and chronostratigraphic plots (Figures 2, 3, and 4) to assess potential correlations between BC tephras and Mount St. Helens Set C.

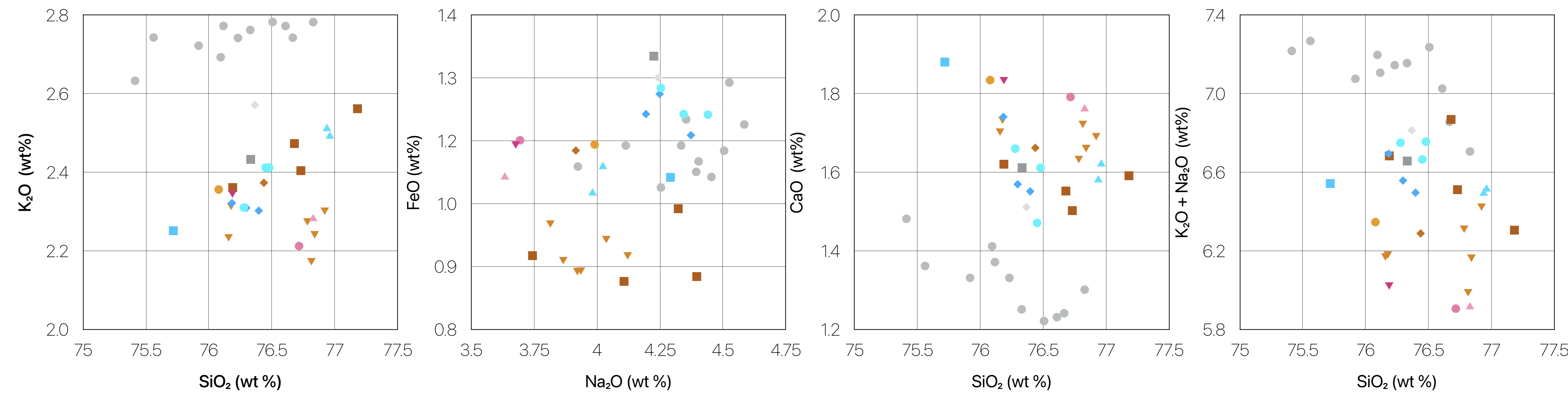


Figure 2: Select plots comparing normalized glass geochemical data from selected tephras in South-Central British Columbia (both cumingtonite- and orthopyroxene-rich) to Mount St. Helens Set C. Geochemical data obtained from the following references: 1. Westgate & Fulton (1975), 2. Lesemann *et al.* (2013), 3. Kuehn & Negrini (2010), 4. Davis (1985), 5. Ramsey & Kuehn (2015), 6. Pritt & Kuehn (2012), and 7. Whitlock *et al.* (2000).

- Cumingtonite Rich**
- Cherryville<sup>1</sup>
  - Mission Flats<sup>1</sup>
  - Okanagan Centre<sup>1</sup>
  - Riggins Road<sup>1</sup>
- Orthopyroxene Rich**
- Dufferin Hill<sup>1</sup>
  - Duncan Lake<sup>1</sup>
  - Sweet Bridge<sup>1</sup>
- New Okanagan Centre**
- MSH Cy<sup>3, 4, 5, 6</sup>
  - MSH Cs<sup>5</sup>
  - MSH Cw<sup>5, 7</sup>
  - MSH Ct<sup>5</sup>
  - OKC-Teph 1<sup>2</sup>
  - OKC-Teph 2<sup>2</sup>
  - OKC-Teph 5<sup>2</sup>

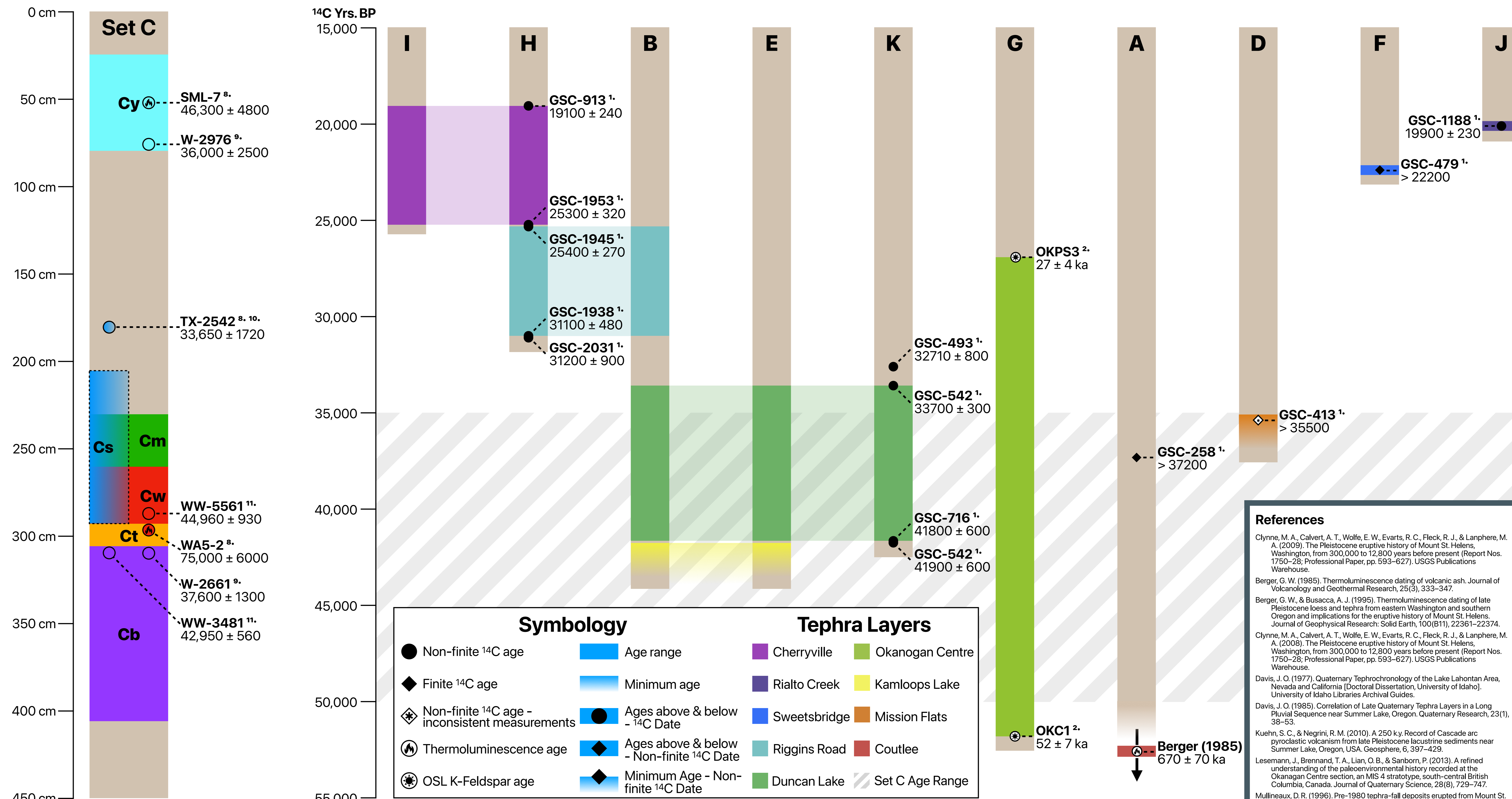


Figure 3: Composite columnar profile of Set C with associated <sup>14</sup>C and thermoluminescence ages. Colour of age points represent associated tephra layer. Figure adapted from 8. Mullineux (1997) and additional ages from 9. Berger and Busacca (1995), 10. Davis *et al.* (1977) and 11. Clynne *et al.* (2009).

Figure 4: Diagram of age constraint and tephra age ranges within each stratum from the localities shown in Figure 1. Age constraints provided by the following: 1. Westgate and Fulton (1975), 2. Lesemann *et al.* (2013), and Berger (1985). Age estimates for Mount St. Helens Set C from Whitlock *et al.* (2000).

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