Resolving the sequence continued

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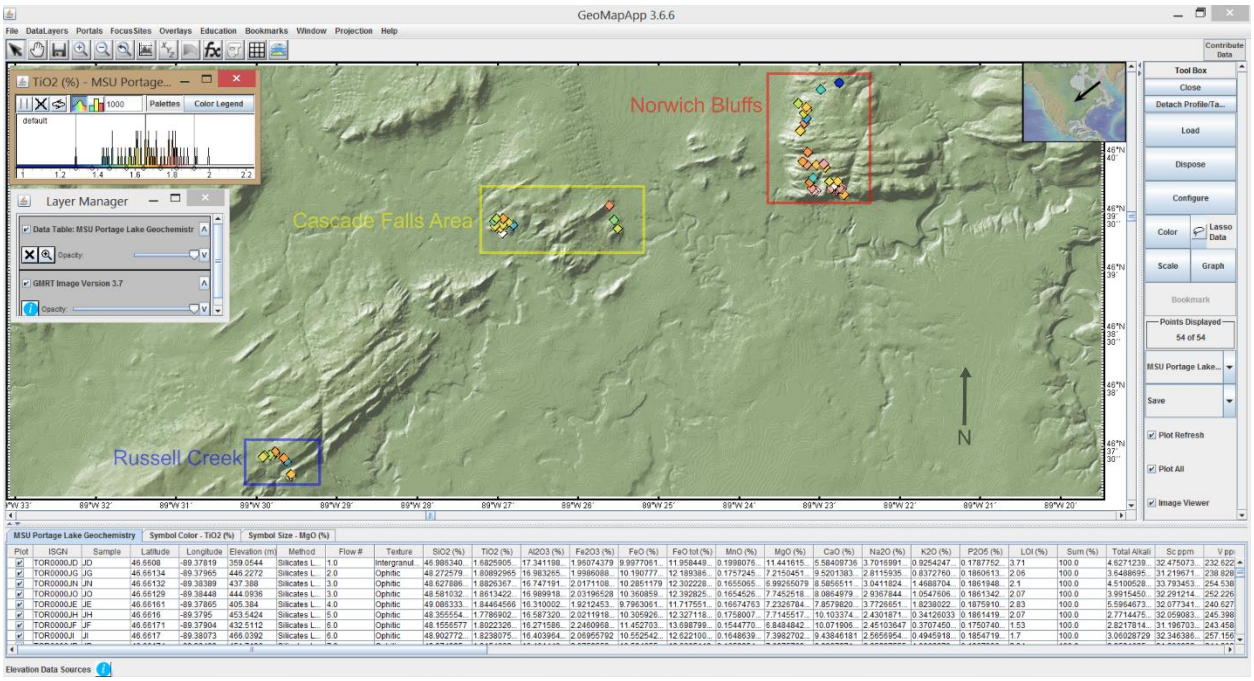
Sampling of the Portage Lake volcanics occurred in three main traverses (Figure 1, this document). The first traverse occurred on a series of ridges that outcrop along Russell Creek (an off shoot of the West Branch of the Ontonagon river), southwest of Cascade Falls (Figure 2, this document). The second traverse occurred in the Cascade Falls area (Figure 3, this document), and the last traverse occurred at Norwich Bluffs (Figure 4, this document). The samples collected from these three traverses were then analyzed as individual sections. To determine the flow sequence of each section we implemented the software GeoMapApp to plot the latitude and longitude of the samples. This allowed us to see which samples were on what ridges and their location relative to each other. The ridges dip to north making the temporal relationship between samples clear, however, some samples appear to be on the same ridge and required further investigation. When samples appeared to be on the same ridge, we then used the geochemistry and petrographic textures of the samples in order to delineate flows from one another. This results in the samples having different colors (see figures below) based on the abundance of an element or oxide is within a sample. At a simplistic level, lava flow interiors should exhibit homogenous geochemistry and texture. Thus, samples that are along the same ridge (strike) and have very similar geochemistry and textures are considered one lava flow. After resolving the sequences of the traverses, the individual sections were then combined into one continuous sequence using the same criteria described above.

The correlation between the Russell Creek, Cascade Falls, and Norwich Bluffs section resulted in a significant overlap between the three sections. This resulted in some flows (flows 3, 13, and 38) having multiple samples with slight differences in geochemistry. In fact, samples TOR0000JN and TOR0000JO (flow 3) were sampled from the same ridge and have slightly different La concentrations (13.0 and 13.7 ppm respectively) as well as slightly different Nb

concentrations (9.9 and 9.8 ppm respectively). These slight differences in concentrations are within analytical error. While differences in geochemistry between samples in flow 13 (TOR0000IT, JL, JM, and JQ) are more noticeable than flow 3, the samples in flow 13 are geographically constrained along the same strike. This also applies to flow 38, which contains samples TOR0000IY, J0, and K3.

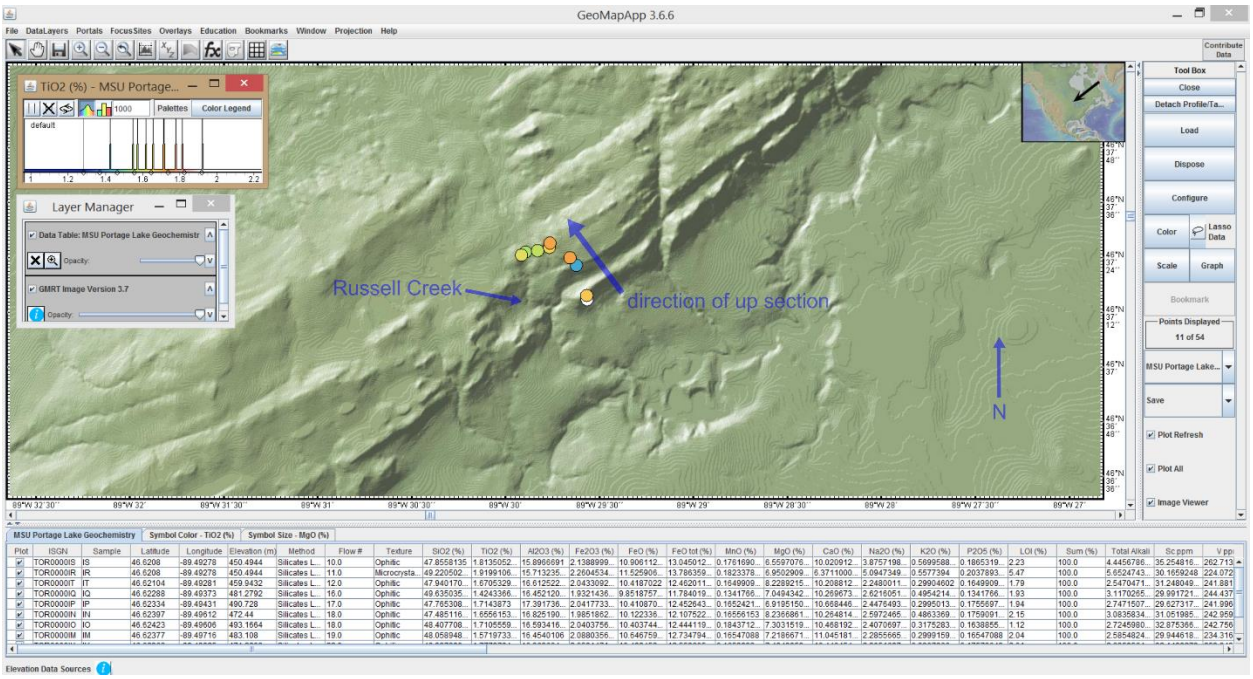
The figures in this document show the position of the samples along the ridges and in relation to each other.

Figure 1



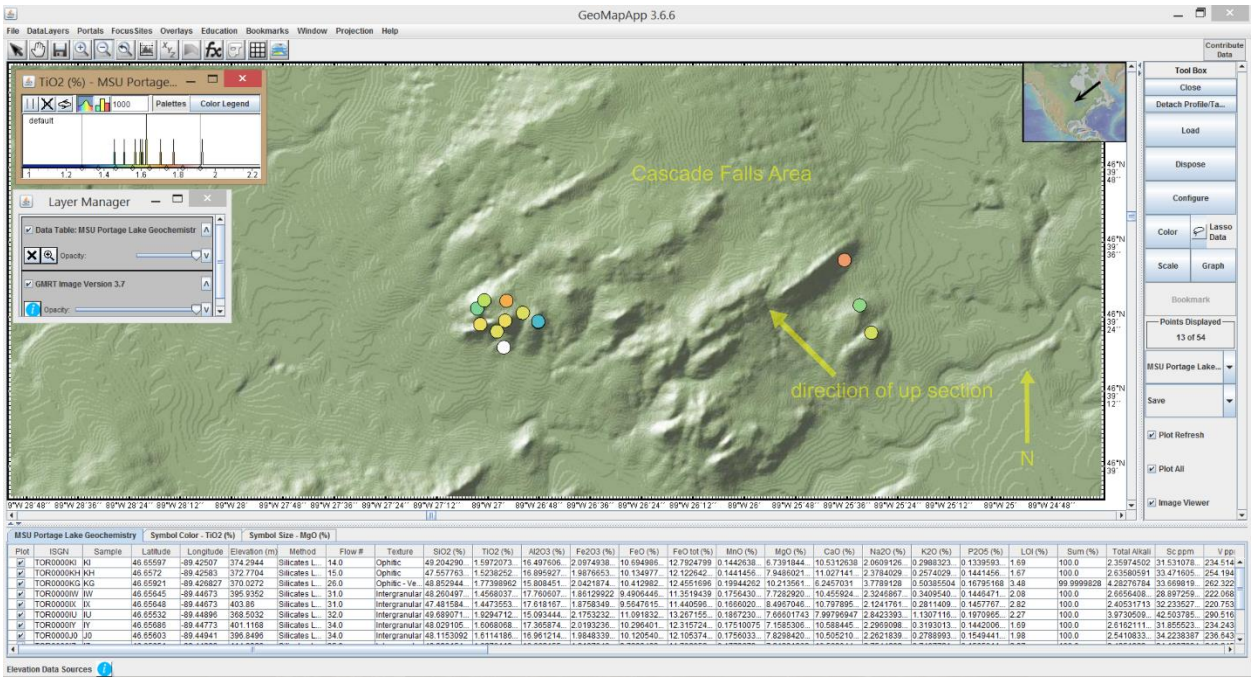
The location of the PLV samples plotted in GeoMapApp. Russell Creek samples are outlined by the blue box, Cascade Falls Area samples are outlined by the yellow box, and Norwich Bluffs are outlined by the red box. Samples dip to the north at Norwich Bluffs and to the northwest at Russell Creek and Cascade Falls Area. The different colors of the samples represent the amount of TiO_2 wt% in each sample, which helped distinguish flows from one another. We also used many other oxides and elements such as: MgO, P_2O_5, Al_2O_3, CaO, Ni, Cr, Nb, La, Zr, Hf, Th etc. White and pink indicate higher amounts of TiO_2 wt%, while blue and green are lowest amounts of TiO_2 wt%.

Figure 2



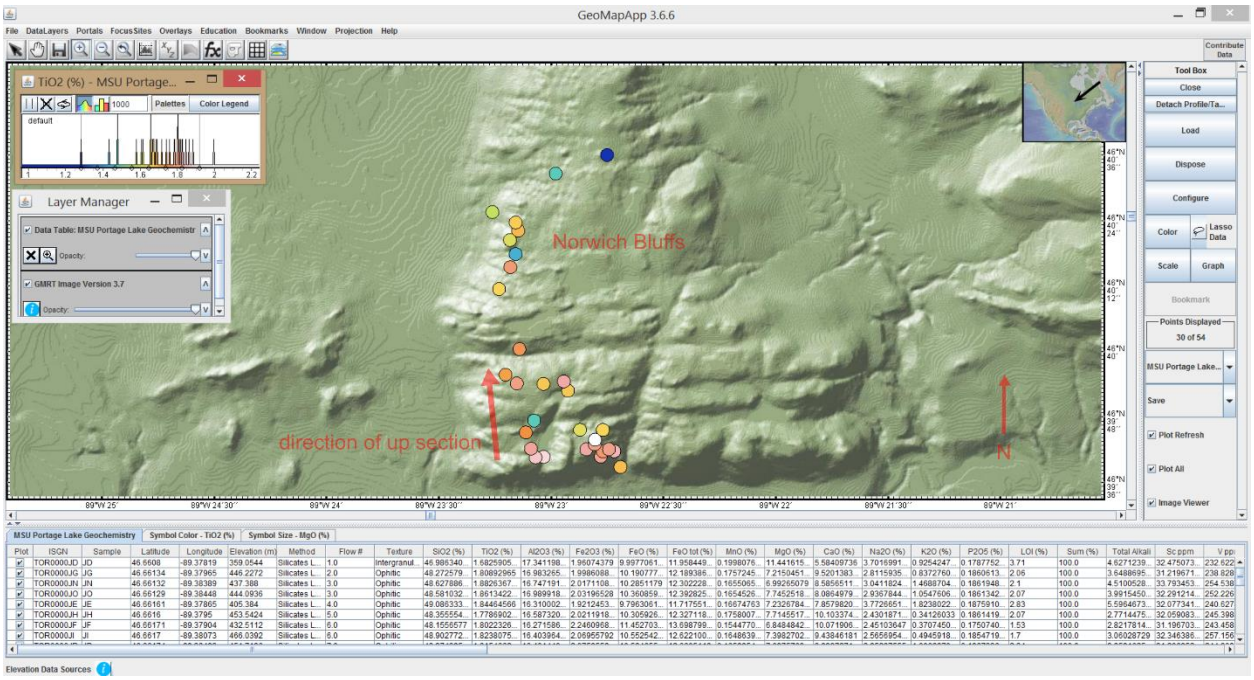
The location of PLV samples collected from a series of ridges that outcrop along the Russell Creek, southwest of Cascade Falls. These lavas dip northwest indicating the up-section direction. The different colors of the samples represent the amount of TiO_2 wt% in each sample.

Figure 3



The location of PLV samples collected from a series of ridges in the Cascade Falls Area. These lavas dip to the northwest indicating the direction of up section. The majority of the samples were collected along and just off the Cascade Falls Trail; however, three other samples were collected east of the Cascade Falls Trail. The different colors of the samples represent the amount of TiO_2 wt% in each sample.

Figure 4



The location of the PLV samples collected from a series of ridges at Norwich Bluffs. These lavas dip to the north indicating the direction of up section. The different colors of the samples represent the amount of TiO_2 wt% in each sample.

Samples with assigned flow numbers

SAMPLE NAME	Flow #
TOR0000JD	1
TOR0000JG	2
TOR0000JO	3
TOR0000JN	3
TOR0000JE	4
TOR0000JH	5
TOR0000JF	7
TOR0000JI	6
TOR0000JP	8
TOR0000JJ	9
TOR0000JK	10
TOR0000IS	11
TOR0000IR	12
TOR0000IT	13
TOR0000JQ	13
TOR0000JL	13
TOR0000JM	13
TOR0000JR	14
TOR0000KI	15
TOR0000KH	16
TOR0000IQ	17
TOR0000IP	18

TOR0000IN	19
TOR0000IO	20
TOR0000IM	21
TOR0000JS	22
TOR0000JU	23
TOR0000JV	24
TOR0000JT	25
TOR0000JW	26
TOR0000IK	26
TOR0000IL	27
TOR0000IJ	28
TOR0000JX	29
TOR0000KG	30
TOR0000K0	31
TOR0000K1	32
TOR0000IW	33
TOR0000IX	34
TOR0000IU	35
TOR0000K2	36
TOR0000IY	37
TOR0000J0	37
TOR0000IZ	38
TOR0000K3	37
TOR0000K4	39

TOR0000K9	40
TOR0000J4	41
TOR0000J1	42
TOR0000J3	43
TOR0000J2	44
TOR0000KA	45
TOR0000KB	46
TOR0000KC	47

References

GeoMap App link: http://www.geomapapp.org/