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Poster Presentation

Mineralogical Analysis of the Mineral Lake Intrusion of Northern Wisconsin

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The purpose of this study was to analyze the mineralogy of the Mineral Lake Intrusion to understand the magmatic process that operated during crystallization. A previous study had identified a possible magma mixing horizon near the middle of this ~6000m thick intrusion. This study utilized new samples near this horizon in an effort to better constrain this possible mixing event. Within this study we sought to answer several questions. First what minerals crystallized, second in what order and proportions did they crystallize, and third what is the composition of the plagioclase minerals? Minerals and their proportions (modes) were determined by point counting methods using a petrographic microscope and plagioclase compositions were determined based on extinction angles these angles showed that anorthite contents of plagioclase range from An_{60} - An_{44} . Similar to the previous study we found that the olivine disappears after 2000m from the base of the intrusion. Olivine then strongly reappears at 3400m to 3900m from the base in three of our samples. This reappearance of olivine also correlates with a drop in the amount of clinopyroxene from 9% to 4%. Here we also find pervasive fracturing through all of the minerals crystallized near this horizon. Both anorthite and Cpx modes show two decreasing trends with increasing stratigraphic height one occurs above and one occurs below the mixing event. All of the data supports the hypothesis that magma mixing has occurred in the Mineral Lake Intrusion.