ANALYSIS OF COMPOSITION AND CHRONOLOGY OF DOME EMPLACEMENT AT BLACK PEAK, ALASKA UTILIZING ASTER REMOTE SENSING DATA AND FIELD-BASED STUDIES

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The purpose of this study is to investigate differences in dome mineralogy and alteration using Advanced Spaceborne Thermal Emission and Reflectance Radiometer (ASTER) satellite imagery, field observations, and laboratory petrologic and spectrographic analyses of the Black Peak volcano complex, Alaska. Black Peak is a 3.5km-wide-caldera on the Alaska Peninsula. The caldera formed ~4,600 years ago by an eruption that deposited <20kmof ash-flow tuffs which filled the valleys to the west and north. The floor of the ice-free caldera consists of approximately a dozen overlapping, mainly andesitic lava domes and coulees. An initial examination of rock samples collected from domes in and around the flanks of the caldera reveals a significant difference in the bulk mineralogy, mainly in the amphibole content and matrix glass alteration. Bulk rock compositions are andesitic and show a mixing trend in SiO^2 content (58-64 wt%). Further analysis of the mineral compositions, proportions, and laboratory spectral signatures will be used to investigate the thermal infrared (TIR) emissivity spectra differences between the domes observed in the ASTER data. Results from the ground-based and satellite data will be used to construct a base-map of the physical and chemical properties of the dome field, augmented by careful ground validation combined with chronologic and stratigraphic studies to better constrain the post caldera eruptive history. Satellite image based mapping for investigation of remote volcanoes can provide an efficient and timely way to assess previously unstudied eruption deposits along the Aleutian Arc.