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Using ASTER Mineral and Vegetation Maps in the U.S. Basin and Range to Evaluate and Assess Lithium-Rich Playas

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Critical resources such as lithium will play an increasing role in the world economy over the next decade. Lithium-rich brines in playas are the main source for current lithium resources. Assessment criteria to identify new potential lithium playa deposits are incomplete but include the presence of diagnostic saline minerals, high-silica volcanic rocks, hydrothermally altered clay and silicic mineralogy, and the presence of green vegetation indicative of a saline playa. In addition, current studies suggest that hydrothermally altered silica-rich volcanic tuffs are a source for lithium in brines. This study compiles and uses Advanced Spaceborne Thermal Emission and Reflection Radiometer (ASTER) mineral and vegetation maps of playas in the Basin and Range to look for mineralogical similarities between a known lithium brine deposit at Clayton Valley, Nevada, and other playas.

The ASTER vegetation and mineral map of Clayton Valley shows a suite of silica-rich, hydrothermally altered rocks surrounded by volcanic rocks near the playa (Fig. 1). In addition, halite and the presence of green vegetation indicate that there is water present to support an underground brine reservoir. These vegetation and mineralogical properties are mapped and described at other playas in the region, such as Railroad Valley, Nevada, to discuss and evaluate their potential for lithium-rich brine resources in the study area.

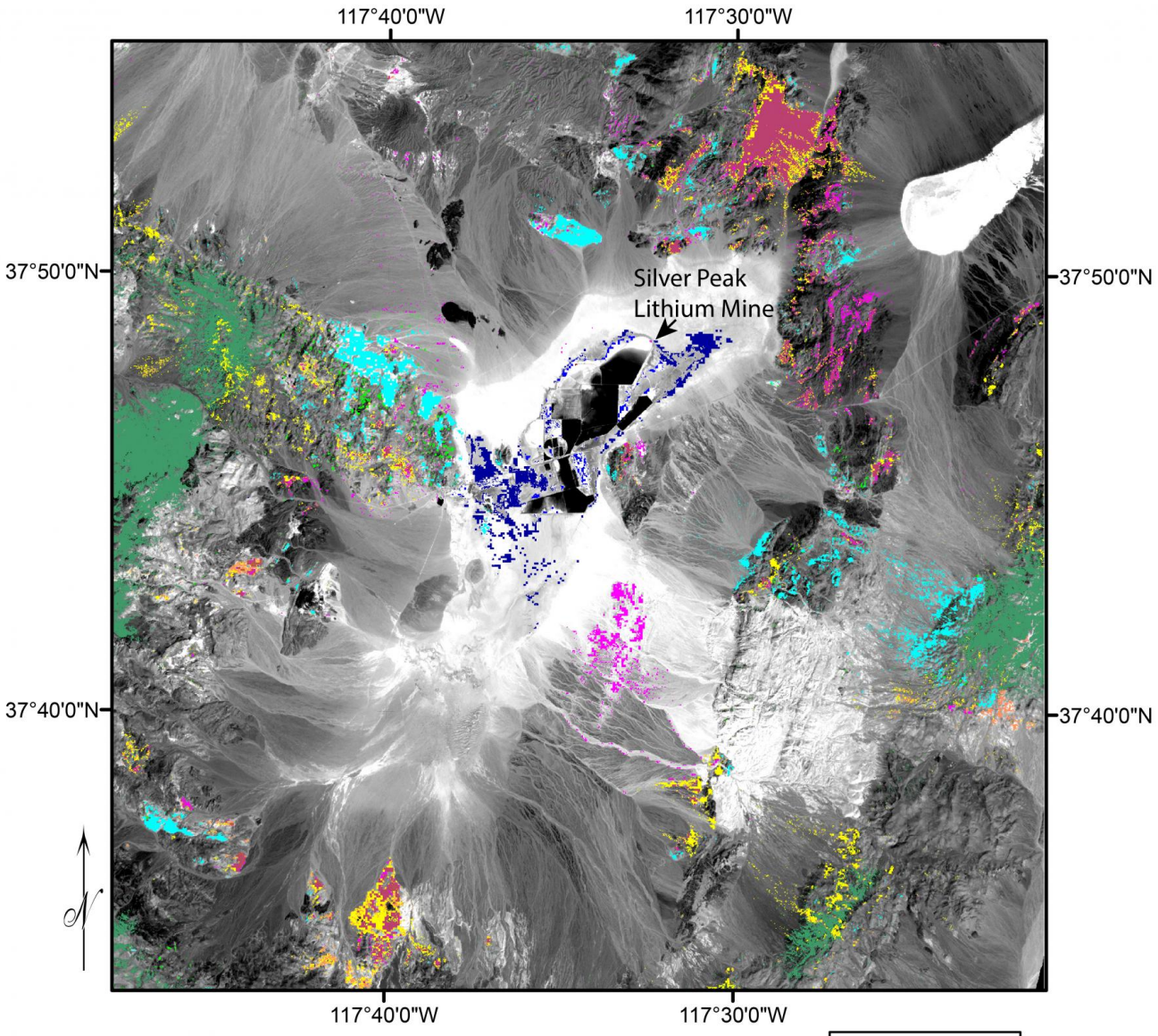

Fig. 1 ASTER mineral and green vegetation map of Clayton Valley, Nevada