Stratigraphic Analysis of Phyllosilicate and Hydrated Sulfate Deposits Across the Margaritifer - Meridiani Boundary

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We present a geologic map of the Miyamoto Crater region and analyze the stratigraphy of phyllosilicate and hydrated sulfate deposits. Miyamoto Crater is a 160-km impact crater to the southwest of the MER Opportunity rover landing site and marks the furthest southwestward extent of the Meridiani Planum materials, which bury approximately half of the crater. Existing high resolution geologic maps within our study region are available only for specific landing site locations, while lower resolution maps provide a more basic context for larger scale Meridiani Planum or Margaritifer Terra processes. We utilize CRISM high resolution FRT sequences (20m/pixel) and MSP strips (200m/pixel) of the D2300 and BD2100 parameters in order to help distinguish map units. We are producing a regional cross section, which ties candidate landing sites (west rim deposits, east Margaritifer chloride, and Opportunity Rover site) to a common geologic timeline. We determine map unit stratigraphy (relative ages) from superposition and cross cutting relationships we find in our 3D mosaic. We are building this regional mosaic from CTX and HiRISE imagery we overlay on HRSC DTM sequences. We discuss periods of aqueous alteration, deposition, and erosion throughout the mapped region to explain the mineralogic stratigraphy and geomorphology.