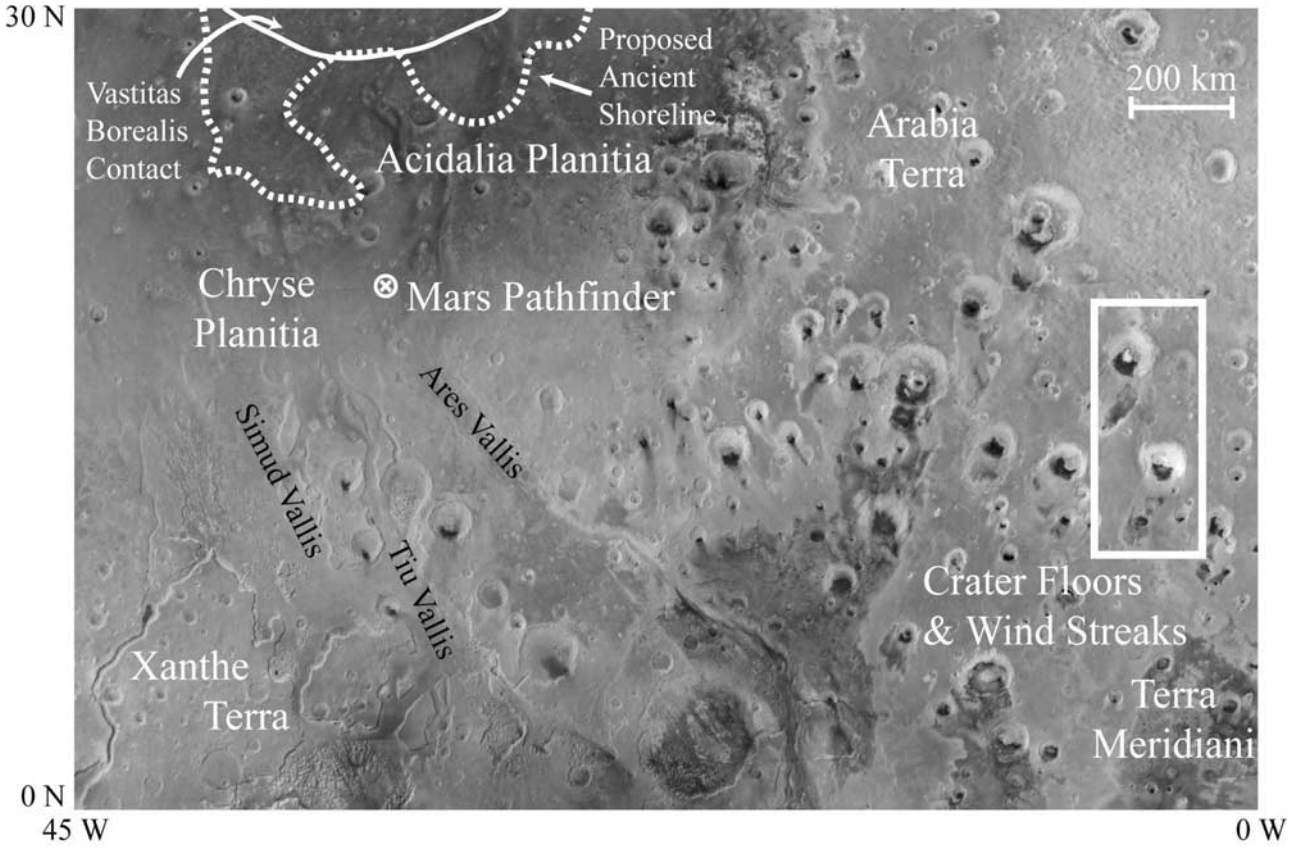

Figure 1. Composite MOC images of Oxia Palus quadrangle. Areas of interest include volcanic/sedimentary materials in southern Acidalia Planitia, low-albedo impact crater floors and adjacent wind streaks, and the Mars Pathfinder landing site and Ares and Tiu Valles source regions.

angles $<30^\circ$ is applied everywhere except the MP landing site, when higher multiple emission angles are examined in an effort to analyze rock surfaces with less bright dust coverings. Multiple emission angle observations, or emission phase functions (EPF), are taken with the TES pointing mirror at several angles in the fore and aft direction during orbit passes creating a mosaic of the targeted surface. Fine-grained dust closely resembles a featureless blackbody spectrum in the wavelengths studied and can mask underlying rock compositions from analysis if sufficient coverings are present [*Crisp and Bartholomew*, 1992].

[9] TES emissivity spectra are linearly deconvolved using average global Martian surface and atmospheric spectral end-members [*Bandfield et al.*, 2000a, 2000b; *Smith et al.*, 2000] to derive surface compositions in Oxia Palus. The least squares fit algorithm, output results, and method used are fully described by *Ramsey and Christensen* [1998], *Bandfield et al.* [2000a], *Christensen et al.* [2000a], and *Smith et al.* [2000]. The surface type 1 and 2 [*Bandfield et al.*, 2000b] spectral end-members, mixtures of the two units, and hematite [*Christensen et al.*, 2000b] have been demonstrated to represent accurately the surface composition of all major low-albedo regions on Mars covered by TES [*Bandfield et al.*, 2000b].

[10] Concentrations of surface type 1 and 2 materials, derived from the linear deconvolution of individual TES emissivity spectra, are binned and averaged into maps of 8 and 16 pixels/degree for regional and high-resolution views, respectively. One square pixel in a TES high-resolution composition map represents approximately a 3.7 km by 3.7 km area at the Martian equator. Each measured TES spectrum represents the average emissivity of an approximate 3 km by 9 km footprint on the Martian surface. Surface concentrations from overlapping TES spectra are averaged within the TES composition maps to improve the signal to noise ratio. The elongated pixel dimension for measured TES spectra is due to the final mapping orbit of MGS being reversed relative to the Martian surface because of a damaged solar panel that caused an extended aerobraking phase. Image motion compensation was originally designed to compensate for the MGS orbit direction; however, it does not produce the intended result when stepping the targeting mirror in a direction opposite that which was originally intended. Averaging derived surface compositions from TES emissivity spectra from different orbits raises the possibility that different atmospheric conditions were present during data collection. However, data are filtered to exclude extreme atmospheric conditions (dust storms, ice clouds), and atmospheric components have been demonstrated by *Bandfield et al.* [2000a] to combine linearly.

[11] To better understand the physical nature of surface materials, we also examine thermal inertia values derived from TES bolometric thermal radiance (5.1 to 150 μm) measurements. Thermal inertia is the primary factor controlling the amplitude of the diurnal variation of surface