The Lunar Mapping and Modeling Project. M. Nall[1], R. French[1], S. Noble[1,2], K. Muery[1] and the LMMP team, [1]NASA Marshall Space Flight Center 320 Sparkman Drive, Huntsville AL 35805 mark.e.nall@nasa.gov, [2]University of Alabama Huntsville, Huntsville AL 35805.

Introduction: The Lunar Mapping and Modeling Project (LMMP) is managing a suite of lunar mapping and modeling tools and data products that support lunar exploration activities, including the planning, design, development, test, and operations associated with crewed and/or robotic operations on the lunar surface. Although the project was initiated primarily to serve the needs of the Constellation program, it is equally suited for supporting landing site selection and planning for a variety of robotic missions, including NASA science and/or human precursor missions and commercial missions such as those planned by the Google Lunar X-Prize participants. In addition, LMMP should prove to be a convenient and useful tool for scientific analysis and for education and public outreach (E/PO) activities.

Project Team: LMMP is managed at Marshall Space Flight Center but draws expertise from across NASA and other agencies, including the Ames Research Center, Goddard Space Flight Center, the Jet Propulsion Lab, the US Geological Survey, and the US Army Corps of Engineers Cold Regions Research and Engineering Laboratory.

Data Sources: LMMP will utilize data predominately from the Lunar Reconnaissance Orbiter, but also historical and international lunar mission data (e.g. Lunar Prospector, Clementine, Apollo, Lunar Orbiter, Kaguya, and Chandrayaan-1) as available and appropriate.

Anticipated Products: LMMP will provide such products as image mosaics and DEMs at local, regional, and global scales; local hazard assessment maps, including slope and roughness, as well as crater and boulder distributions; temperature maps, lighting maps and models, gravity models, and resource maps. Local scale products are initially being produced for the established set of Exploration Regions of Interest [1]. Other sites may be considered based upon available time and resources. We are working closely with the LRO team to prevent duplication of efforts and ensure the highest quality data products. A select few representative preliminary products based on LRO data will be released through March 2011. These are preliminary in the sense that they are developed with data obtained early in the exploration phase of the mission and only geodetically controlled to preliminary Lunar Orbiter Laser Altimeter (LOLA) topography. Final products, those based on the best available exploration mission phase data and LOLA topography, will be released between March and September 2011.

Software: The LMMP system is designed to make data as accessible as possible in order to meet the needs of a wide variety of users. Our system (fig. 1) consists of three visualization options: the Portal, which provides limited browsing, data layering and analysis options; Lunar Mapper, a light web-based GIS client; and ILIADS, a downloadable desktop GIS client with more advanced capabilities.
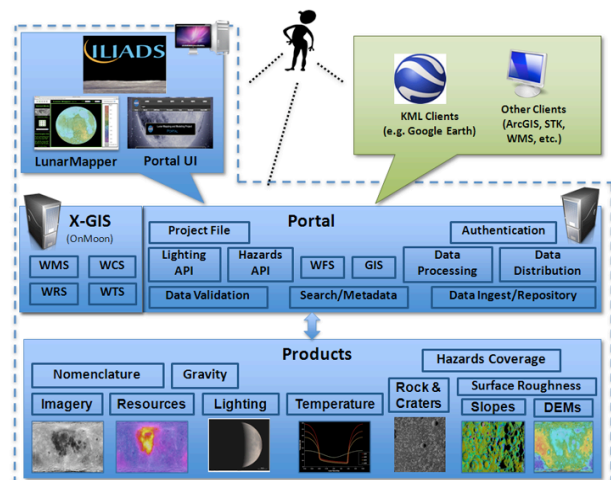

Figure 1. Diagram of the LMMP system

Project Timeline: A beta version of the LMMP software was released for limited distribution in December 2009, with a first public release planned for late Fall of 2010. The final release is expected in September 2011.

References: [1] Noble S. K. et al. (2009) Abstracts to the NASA Lunar Sci Forum #70.