

EnkiGIS - Accelerating The Study of Extraterrestrial Geology and Resource Development. K. Loney¹ and Z. Trolley², ¹Lunar Water Supply Company, 456 12 St NW, Calgary, AB, Canada, kevin.loney@lunarwatersupply.com, ²Lunar Water Supply Company, zac.trolley@lunarwatersupply.com.

Introduction: Understanding and quantifying natural space resources is the first step in developing in-situ resource utilization (ISRU) and the creation of a space economy. This process relies on the wealth of information on the Moon and other celestial bodies spread across disparate archival systems managed by multiple international agencies (e.g. NASA's PDS, JAXA's DARTS, ISRO's ISSDC, ESA's PSA, etc.). However, these archives, which contain both raw datasets and higher-order products, do not currently exist in a user-friendly, easily searchable format because PDS as a standard exists predominantly as an archival tool and not a discovery tool which is a shortcoming PDS acknowledges but is unable to address. [1]

While the data in its current format has allowed water to be identified as a resource, the full potential for ISRU requires locating a water reserve. [2,3,4] The development of robust lunar GIS data discovery and reserve classification tools is critical to the understanding and use of resources on the Moon.

EnkiGIS - A Space Resource Tool: To solve this issue, we have begun developing EnkiGIS. This tool is currently designed as a comprehensive, searchable metadata index of multiple planetary science archives allowing for rapid discovery of relevant data. Available as a REST API, a python library, and command-line tool, it provides easy access to multiple archives simultaneously. Future development plans also include tackling the usable-format information problem to allow rapid retrieval of relevant data in the end user's preferred format, map projection, etc., to help simplify the creation of bespoke datasets to help answer specific resource questions.

Our end goal is to lower the barrier of entry for planetary data, thereby accelerating the study of non-terrestrial geology and resource development

References: [1] McNutt Jr, R. L., et al. "The NASA Planetary Data System Roadmap Study for 2017-2026." AGU Fall Meeting Abstracts. Vol. 2017. 2017. [2] Kleinhenz, Julie, et al. Lunar Water ISRU Measurement Study (LWIMS No. E-19884. 2020. [3] Cannon, Kevin M., and Daniel T. Britt. "A geologic model for lunar ice deposits at mining scales." *Icarus* 347 (2020): 113778. [4] Barker, Donald C. "Lunar and off Earth resource drivers, estimations and the

development conundrum." *Advances in Space Research* 66.2 (2020): 359-377.

Additional Information: If you would like more information or to get access to our API and beta development, please contact Zac.Trolley @ lunarwatersupply.com