

ANALYSIS OF LUNAR LOCATIONS FOR FUTURE MISSIONS.

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Over the past decade scientists have discovered water in various forms in many locations on the moon's surface. The most promising location to find high concentrations of frozen water molecules seems to be deep in the permanently shadowed regions of craters at the moon's poles. Extracting these water molecules would not only be useful for future lunar missions, but would also give us a better understanding of our closest, yet still slightly mysterious, neighbor. Our objective in conducting this research project is to determine what lunar location would yield the highest probability of water and scientific research opportunities. The identified location will allow for habitability for an extended period of time should we return to the moon. Using several maps from instruments on board the Lunar

Reconnaissance Orbiter (LRO) and the Lunar Exploration Neutron Detector (LEND), we were able to design a ranking that compares seven sites at the Moon's south pole and north pole. These seven places include M.5. Mountain, Shackleton Crater, Shoemaker Crater, Lcross Mountain, Scott Crater, Amundsen Crater and Malapert Mountain. The data collected and thus, the ranking of each location, is based on the following criteria: sun visibility, earth visibility (for communication purposes), temperature, and the presence of hydrogen volatiles (for the probable presence of frozen water). After scoring all of the craters from best to worst using these four categories and averaging the scores using geometric mean, we conclude that the region around Malapert Mountain would be the optimal place to send a research team.