S.T.E.M. LPI: Moon 101

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ABSTRACT

Lunar craters are divided into two distinct classifications, Primary and Secondary, based mainly upon geographic features. Further classification of these impact sites based on multiple variables has been the interest of this project. The main hypothesis being tested was that a ratio of the depth of the crater and the diameter of the crater would better determine classification. By examining a sample group of 42 craters within a range of 26-34 kilometers in diameter the traditional geographical features that determine Primary craters were first identified; complex inner terrain, outlying impact patterns to determine possible ejecta, and crater geometry. Branching further, previously documented data on the depth of the craters was used to then calculate a ratio of this depth versus the recorded diameter of the impact site. The ratios determined by this data averaged to be around 0.0867. Yet, since the data fell within a constant rate, this form of determination alone could not identify the difference between a Primary and Secondary crater. Further research with an even more expanded set of variables is needed to accomplish our goal.

OBJECTIVES

To classify 30km craters as either Primary or Secondary.

Determine a depth/diameter ratio

Observe regional terrain to classify any patters.

METHODOLOGY

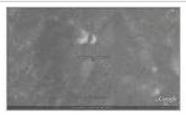
Primary Data Gathering

Gathered crater information (Identity, Diameter, Longitude & Latitude)
Compiled and documented craters that ranged from 26 - 34 kilometers.
Made use of Google Earth's Moon feature to collect pictures of all the craters registered.

Detailed Data Gathering

Examined Crater Region for similar sized impact sites
Calculated a ratio between given Depth and Diameter
Looked for trends between separate sets of data
Predicted Crater type upon the look of the Impact region against the Depth-Diameter Ratio

RESULTS

A	B	C	D	E	F	G
Name	Image	Location	Depth/Diameter Ratio	Depth (km)	Diameter (km)	Regional Look
Alhazen		15.9N 71.9E	0.0625	2	32	no secondary craters; seems to have a mountainous landscape within the crater's rim
Arago		6.2N 21.4E	0.069231	1.8	26	plain; no secondary craters
Argelander		16.5S 5.8E	0.088235	3	34	two large secondary craters with a few around the crater itself

CONCLUSIONS

After piling through the data, we have determined that for craters of this size that depth/diameter ratio stays within a limited range and further information would be required to truly determine whether the craters are Primary or Secondary.

REFRENCES

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Lunar Impact Crater Geology and Structure. (n.d.). *Lunar and Planetary Institute (LPI)*. Retrieved April 25, 2011, from http://www.lpi.usra.edu/expmoon/science/craterstructure.html

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FUTURE STUDIES

Continue to gather data concerning crater depth and diameter

Possibly expand set of data to include; Crater age, edge slope, and temperature

Build up a website to exhibit set of craters coupled with their related information