Observational bias and the apparent distribution of ponds on Eros.

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Note

Observational bias and the apparent distribution of ponds on Eros

James H. Roberts ... Louise M. Prockter

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Abstract

Over 300 â€œpondsâ€ have been identified on 433 Eros: smooth deposits that sharply embay the bounding depressions in which they lie. The known ponds are largely concentrated near the equator at the ends of the long axis of the asteroid. Here, we examine the pixel scale of images available at the pond locations, and compare the observed distribution of ponds on Eros to that of the image pixel scale. We find that the majority (60%) of ponds are found in the regions covered by images with pixel scales less than 2Â m/px, a total of only 13% of the surface area. The correlation between pond density and image pixel scale suggests a significant observational bias in the identification of small ponds. These findings suggest that the distribution of ponds on Eros may not be as clear-cut as previously reported, and that it may be best not to use this distribution to assess existing models regarding their formation of these landforms.

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Keywords

Asteroid Eros; Near-Earth objects; Geological processes; Asteroids, surfaces

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