Where have all the craters gone?

28 May 2014, by Kea Giles

Ouarkziz Impact Crater. Credit: NASA

Impact craters reveal one of the most spectacular geologic process known to man. During the past 3.5 billion years, it is estimated that more than 80 bodies, larger than the dinosaur-killing asteroid that struck the Yucatan Peninsula 66 million years ago, have bombarded Earth. However, tectonic processes, weathering, and burial quickly obscure or destroy craters. For example, if Earth weren't so dynamic, its surface would be heavily cratered like the Moon or Mercury.

Work by B.C. Johnson and T.J. Bowling predicts that only about four of the craters produced by these impacts could persist until today, and geologists have already found three such craters (larger than 170 km in diameter). Their study, published online for *Geology* on 22 May 2014, indicates that craters on Earth cannot be used to understand Earth's bombardment history.

Johnson and Bowling write, however, that layers of molten rock blasted out early in the impact process may act as better records of impacts—even after the active Earth has destroyed the source craters. The authors suggest that searches for these impact ejecta layers will be more fruitful for determining how many times Earth was hit by big asteroids than searches for large craters.

More information: B.C. Johnson and T.J. Bowling. Where have all the craters gone? "Earth's bombardment history and the expected terrestrial cratering record." *Geology*, G35754.1, first published on May 22, 2014, DOI: 10.1130/G35754.1

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