NASA’s latest asteroid target had a wet and wild history

Long before it struck out on its own, a distant, small asteroid called Bennu had a wet, watery start, according to new evidence just announced by NASA.

NASA’s OSIRIS-REx spacecraft, which arrived at Bennu on December 3rd after a two-year journey, is currently positioned about 12 miles above the surface of the asteroid. It recently sent back data indicating that the asteroid’s surface is littered with clay-like minerals that indicate that parts of this space rock had liquid water at some point in its distant past.

“Bennu appears to be a very water-rich target, and water is the most interesting and perhaps the most lucrative commodity that you would mine from an asteroid,” Dante Lauretta, principal investigator of the OSIRIS-REx mission, said at a press conference today.

Water is considered valuable for future space missions because it is a potential source of fuel. Being able to mine asteroids for water would mean that future missions wouldn’t have to rely on Earth for fuel, and could potentially explore further into the Solar System.

It’s important to note that while Bennu might be water-rich, that doesn’t mean it has liquid water on its surface *now*. Slightly over 1,600 feet in diameter, Bennu is currently so small that its surface is unable to support liquid water. Researchers hypothesize that between 800 million and a billion years ago, the boulder-strewn heap of rubble we know as Bennu was probably part of a larger asteroid, more than 62 miles in diameter, which would have been big enough to support water. Planetary scientists think that the larger body was shattered

in a huge collision, leaving smaller pieces like Bennu floating through space in accumulations that resemble massive piles of rubble.

People working on the project have long suspected that Bennu might have these kinds of water-rich clays. “Bennu is proving to be just the asteroid we hoped it would be,” Jeff Grossman, program scientist for the OSIRIS-REx mission, said at today’s press conference.

The spacecraft got its very first glimpse of its target in August of this year, when Bennu was still a distant speck, 1.4 million miles away. In the past few months, the asteroid’s surface has come into focus, and researchers now have a much better idea of what it is made of. During the approach, the spacecraft’s instruments picked up readings showing that there were water-rich clays on Bennu’s surface.

“This is really big news and this is a great surprise,“ Amy Simon, a deputy instrument scientist on the OSIRIS-REx mission, said at the press conference.

In addition to the presence of once-wet materials, researchers also announced that they’d gathered enough data to create a new, more accurate 3D model of the asteroid’s surface.

NASA/Goddard/University of Arizona

The model might look solid, but Bennu has hidden depths. Based on the data gathered so far, the researchers estimate that as much as 40 percent of Bennu’s interior could simply be gaping voids.

OSIRIS-REx will enter orbit around Bennu on December 31st and will eventually start mapping its surface in detail. The spacecraft will stay near Bennu for the next few years, sticking around until 2020 when it will make contact with the asteroid’s surface, hopefully picking up a sample before taking its leave in 2021. It is scheduled to return — with whatever it collects — back to Earth in 2023.

https://www.theverge.com/2018/12/10/18134714/bennu-water-evidence-nasa-osiris-rex