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We've lost track of more than 900 near-Earth asteroids

Now we see it, now we don't
Andrezej Wojcicki/SPL

By **Leah Crane**

We have lost more than 900 near-Earth asteroids. We'd seen each of these potential near-Earth asteroids once, but we didn't continue tracking them, so we don't know where they are or if they're on a crash course with Earth.

Between 2013 and 2016, 17,030 potential near-Earth asteroid (NEA) candidates were added to a list maintained by the International Astronomical Union's Minor Planet Center. Of those, about 11 per cent were categorised as "initially unconfirmed". This means that the few observations we had were not enough to pin down an orbit, so we don't know where on the sky to look to find these objects again.

Peter Vereš at the Minor Planet Center and his colleagues sifted through the data to figure out why we lost track of so many of them. They found that the main factor is time. To nail down an

asteroid's trajectory, it has to be observed more than once across a period of a few hours. "We need to act fast," says Vereš. "Tomorrow, that object could be on the other side of the sky, and nobody really knows where it will be."

Some telescopes take 20 hours or more to report potential NEAs, which makes them almost impossible to find again and confirm. Sometimes bad weather means that we can't look again in the hours following the initial observation. And the objects can be moving up to tens of kilometres per second, hurtling across the solar system so fast that a few hours after we first saw them, they could be almost anywhere on the sky.

Potentially hazardous

Because we couldn't calculate their orbits, we don't know how close these asteroids could get to Earth, but Vereš says they could be anywhere from several times the moon's distance to much closer than the moon.

The researchers used initial measurements of each asteroid's brightness to estimate its size. The biggest of the lost asteroids appears to be a few kilometres across, Vereš says. For comparison, the asteroid that killed the dinosaurs is believed to have been about 10 kilometres across.

Vereš and his colleagues estimated that 102 of the unconfirmed NEAs have diameters above 140 metres, the line at which we define an asteroid as potentially hazardous. Most of the rest are tens of metres across or smaller.

This may be an issue for our estimates of how many NEAs there are total. "If the models don't take these unconfirmed objects into account, maybe they underestimate the total population by 10 or 20 per cent," Vereš says.

Luckily, he says, this is mainly a problem for smaller objects. "We believe that the largest ones – planetary killers larger than one kilometre – those are basically all found."

Vereš says we shouldn't be worried – statistically, even a dangerous but non-lethal object about 20 metres across only hits Earth once every 50 to 100 years, and bigger impacts are even more rare. "I would say the danger is coming from objects we haven't discovered yet," he says.

Reference: arxiv.org/abs/1805.02804

Read more: Don't fear apocalyptic asteroids: you're safer than you think

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