Math wizards stand ready to join Malaysia Airlines search

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Math wizards who pinpointed the final resting place of a doomed Air France jet deep beneath the Atlantic stand ready to do so again for Malaysia Airlines Flight 370.

No one has yet asked Metron, a scientific consulting firm, to join the search for the missing Boeing 777, but that hasn't stopped it from getting a head start, using the few nuggets of data currently in the public domain.

"We're trying to get our hands on all the publicly available data so we can start doing an independent assessment," Van Gurley, a senior manager in Metron's advanced mathematics applications division, told AFP on Wednesday.

As that assessment evolves, "we'll provide it to anyone who's interested," added Gurley at Metron's head office in Reston, Virginia, a suburb of Washington.

Founded in 1982, with a staff of 170 that includes experts in applied mathematics, Metron conducts highly specialized analysis for US national security applications, such as sonar systems.

But it has also developed a much-used search and rescue protocol for the US Coast Guard based on a theorem developed by early 18th century English statistician, philosopher and Presbyterian minister Thomas Bayes.

"It's a structured method that forces you to look at all the available information about a problem and then apply a confidence factor—how confident you are in any piece of information," Gurley said.

No single bit of data is ever thrown away, but as information is confirmed over time—say, when a speck in a satellite image turns out to be genuine debris—the probability that the target item is in a given spot evolves.

In the case of Air France Flight 447, which crashed into the Atlantic in 2009 with 228 on board, the target was its flight data recorder lying at the bottom of the ocean.

The French air accident investigation agency BEA turned to Metron to figure out the most likely spot where the so-called black box might be—successfully, it turned out when undersea drones recovered it in May 2011.

In that case, however, floating debris from the Airbus A330 had been located within a week and the search area was limited to a circle about 80 miles (130 kilometers) in diameter, Gurley said.

That's practically a flyspeck compared to the vastness of the remote section of the Indian Ocean where the Malaysian authorities said Wednesday that "122 potential objects" had been spotted by satellite in recent days—with not a single piece of confirmed debris since the jet went missing on March 8.

"Everybody wants to know where it is, and the answer is: we don't know," said Gurley, sitting alongside a vivid computer image of the entire Indian Ocean depicting the latest search zones west of Australia.

Overlaid on the screen are green triangles, each representing a ship at

sea, provided by exactEarth, a Canadian firm that tracks ship movements worldwide in real time using satellite signals.

Just three triangles stood out in the search zone Wednesday, all of them vessels combing the waters for debris.

Commercial shipping lanes to and from Australia lie well to the north, and they're not especially crowded. Gurley acknowledges that Bayesian theorem doesn't guarantee success.

While the Coast Guard regularly uses Bayesian theorem to find, say, fishermen lost at sea, it came up short when Metron was asked in 2007 to find missing US adventurer Steve Fossett, who had been out flying a small airplane in a mountainous corner of California.

A year passed before a hiker just happened upon some of Fossett's belongings, some distance from where he was presumed to be. Bones found nearby were confirmed through DNA tests to be his.

Asked what the odds of locating Malaysia Airlines Flight 370, let alone the cause of its disappearance, Gurley said the technical means to accomplish the mission is at hand, as difficult as it might be.

"The technology is available to get to the ocean bottom in this part of the world and search it," he said. "But it's an incredibly challenging task—and I think it's really going to come down to time, and will."

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