Mysterious GPS glitch telling ships they're parked at airport may be anti-drone measure

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SAN FRANCISCO — Researchers have discovered a disturbing pattern: dozens of ships whose GPS signals tell them they’re on land — at an airport no less — even when they’re far out to sea.

An investigation released last week by Washington D.C.-based Resilient Navigation and Timing Foundation and Windward Ltd., a maritime data and analytics company, found multiple instances of so-called GPS spoofing in Russian waters.

As recently as last month, two vessels' GPS told them they were at Sochi Airport near the site of the 2014 Sochi Olympics, 12 miles away from the harbor where the vessels actually were.

Researchers are calling these “mass GPS interferences,” and they appear to be linked to the intentional transmission of false GPS signals to provide incorrect time or location information, possibly to veil certain facilities from attack.

Familiar to anyone using a smartphone or built-in auto navigation system to map out a route, the satellite-based system is also the main way ships and trucking fleets find their way.

While the actual intent isn't known, speculation among GPS experts has in recent weeks converged on the theory that the GPS disruption of ships is actually a side effect of efforts to protect sensitive Russian sites such as the Kremlin and Russian President Vladimir Putin's summer home from surveillance and attacks by drones.

“My best conjecture is that Russia is conducting GPS spoofing in an effort to ward off drones,” said Todd Humphreys, a professor of aerospace engineering at the University of Texas at Austin and an expert on GPS hacking.

Commercial drones are programmed to include the location of airports to keep them out of the flight path of planes. If a drone flies too near an airport, the instructions of its pilot are overridden, and the drone's programming requires it either to fly away or to land — a technique called geofencing.

“So one way of keeping a drone away from an certain area is to fool it into thinking it’s near an airport, so it will immediately land or leave,” Humphreys said.

Putin has long been rumored to have a lavish secret estate on the Black Sea coast near Gelendzhik, where researchers found one instance of GPS spoofing.

The report's authors initially started to examine instances of GPS misdirection after a vessel master in the Black Sea reported his GPS showing him to be at the Gelendzhik airport, in southern Russia, about 25 miles from his real location, said Dana Goward, president of the
Resilient Navigation and Timing Foundation. “He provided photographs of equipment and other information that convinced experts his GPS receiver was being deliberately spoofed.”

The ship reported the incident to the U.S. Coast Guard. Over the course of the next few days, 24 vessels in the area were affected, according to research by the Norwegian Broadcasting Corporation. When the non-profit followed up a month later, they found evidence that GPS signals were still being periodically disrupted in the area.

Self-driving cars may not hit the road in earnest for many years – but autonomous boats could be just around the pier. Big maritime firms have committed to designing ships that won’t need any captains or crews _ at least not on board. (Sept. 12) AP

The ability to alter GPS data could cause dangerous accidents, especially if it involved subtle shifts that caused a vessel to be only a few hundred feet off course without realizing it.

The possibility of GPS interference was raised in the August collision of the USS John S. McCain with an oil tanker off Malaysia, which left 10 sailors missing and five injured, though so far no evidence has been found in that particular case.

The authors of the report found three specific instances of GPS spoofing in which ships’ GPS-based navigation systems told them they were many miles from their location: at Russia's Gelendzhik Airport and Sochi International Airport near the Black Sea and St. Petersburg Airport near the North Sea.

Windward also found instances where some vessels whose GPS told them they were at Sochi Airport were really located near Gelendzhik, about 125 miles away.

“The speculation is that there are specific sites which are being defended by this system,” said David Last, former president of the Royal Institute for Navigation in the United Kingdom.

Ships aren’t the only ones being misdirected in Russia. Drivers in downtown Moscow find their GPS systems giving wildly incorrect readings.

“People in downtown Moscow often find their GPS receivers placing them at Moscow’s Domodedovo airport, about 25 miles away,” Goward said.

A Norwegian reporter posted a video recently showing a photo he took in Moscow, which listed its location as Vnukovo International Airport 20 miles to the southwest, even though he was standing in front of the Kremlin.

The intent there would be to protect Russia’s iconic capital area from possible attacks. ISIS, for example, has been known to use drones to drop bombs, Humphreys said.

GPS jamming and spoofing isn’t new, with known instances perpetrated by North Korean, Chinese and Russian military, Goward said.