

SkyFail: What happens if America's satellites suddenly go down?

April 17, 2018



Americans rely on satellites every day – more than we even realize. Our greatest familiarity is with GPS, helping us find the fastest way to our

destination and to order a ride at the push of a button. We use satellites for weather forecasting, not only to help us decide if we need to wear a jacket, but more importantly to give us enough forewarning to evacuate during severe weather events like hurricanes.

What you may not realize, is that satellites are also critical to stock markets, national security and emergency response. So, what happens, if one day, they suddenly go down. That reality is all too possible.



[View the full infographic](#)

Russia, China, Iran, North Korea and other actors have recognized America's growing dependence on satellites and are actively developing counterspace capabilities.

[Space Threats Assessment 2018](#), a report from the Center for Strategic and International Studies (CSIS) and funded by the Aerospace Industries Association, provides an in-depth look at American vulnerability in space and the "wide array of threats, ranging from cyberattacks and jamming to direct-ascent anti-satellite (ASAT) missiles."

This report outlines dozens of chilling real life examples. In 2014,

Chinese hackers attacked a NOAA satellite forcing the U.S. to take the system down and stop submitting important satellite images to the National Weather Service for two days. In 2017, a ship operating in the Black Sea measured a 30-mile error in its GPS fixing position as part of an apparent GPS spoofing attack; over 20 other ships in the region reported similar issues. These are just two of those examples listed in the report, and even more remain classified.

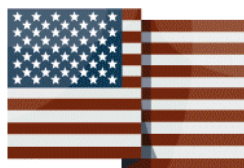
“We have to up our game if we’re going to stay competitive,” said [Director of National Intelligence Dan Coats](#). “We have to become much more agile, more innovative, more creative.”

“Urgent action is needed. Countering this new reality requires a clear understanding of the threats and an approach highlighted by renewed national commitment and increased investment,” cautions General (Ret.) C. Robert Kehler, a former commander of both U.S. Strategic Command and Air Force Space Command.

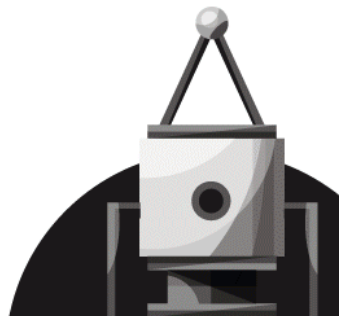
As the report highlights, “[counterspace weapons are already being used](#) against the United States and its allies and partners on a regular basis. While it is difficult to imagine a world without the advantages space provides to the military and daily life, it is far too easy to take these capabilities for granted. The growing threats against U.S. space systems and the ground stations that support them require immediate attention and action from policymakers.”

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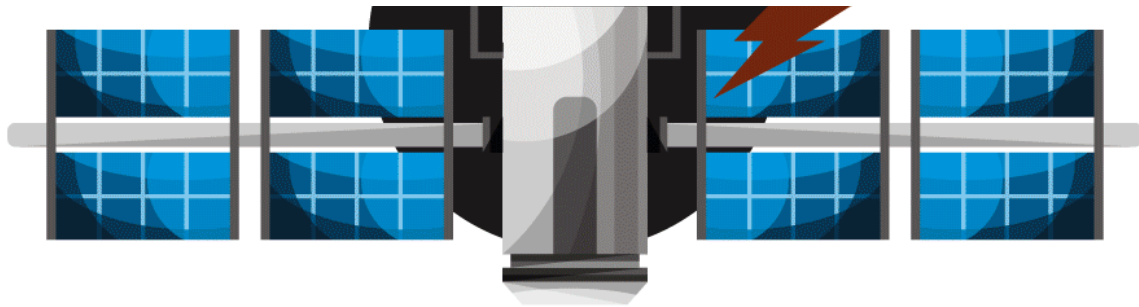
Read the full [Space Threats Assessment 2018](#) and check out the complete infographic showcasing the consequences of satellite failure below.



HUNDREDS OF MILLIONS OF AMERICANS rely on satellites every day

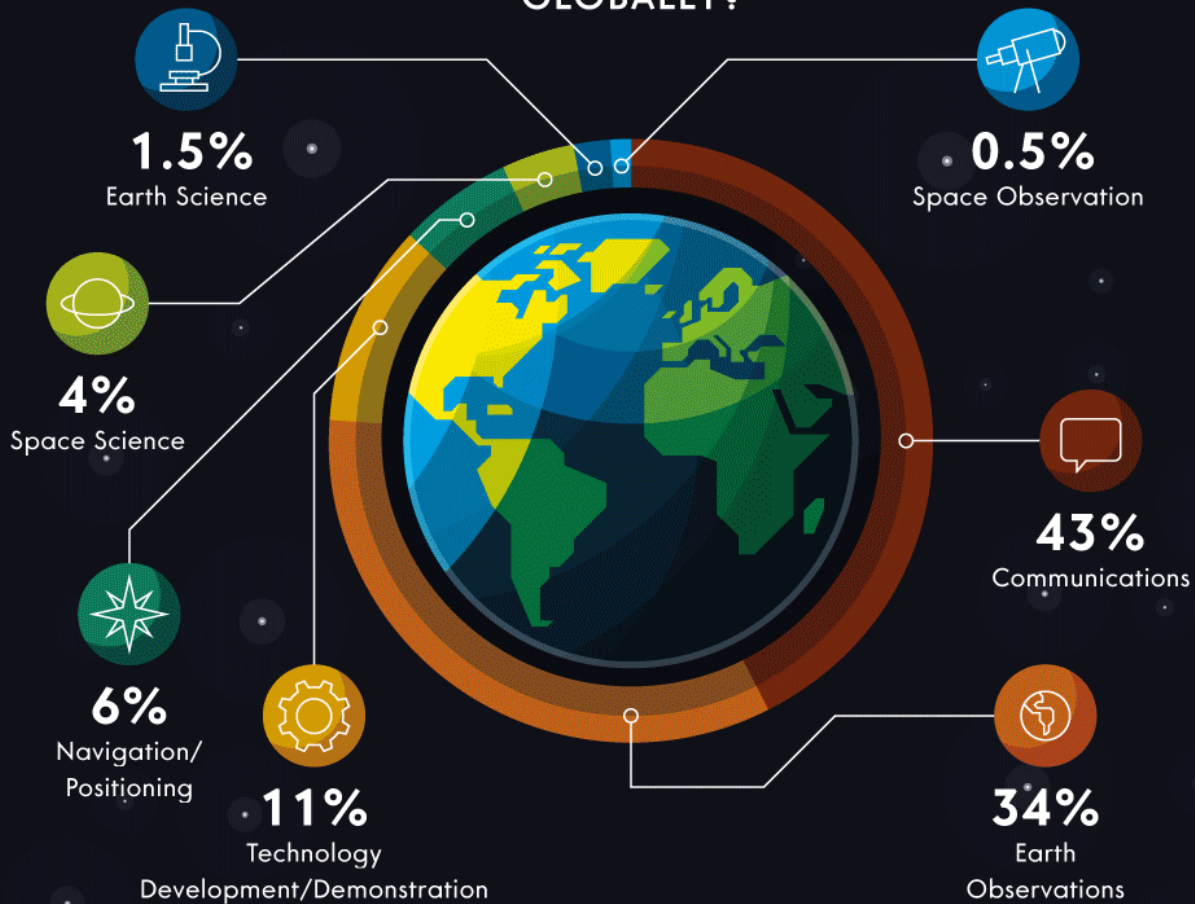


From weather forecasts to ATMs, GPS to stock markets, agriculture to national security, 911 response to cell phones, we **depend on satellites** to keep us safe, enable our financial system and make our modern lives possible.



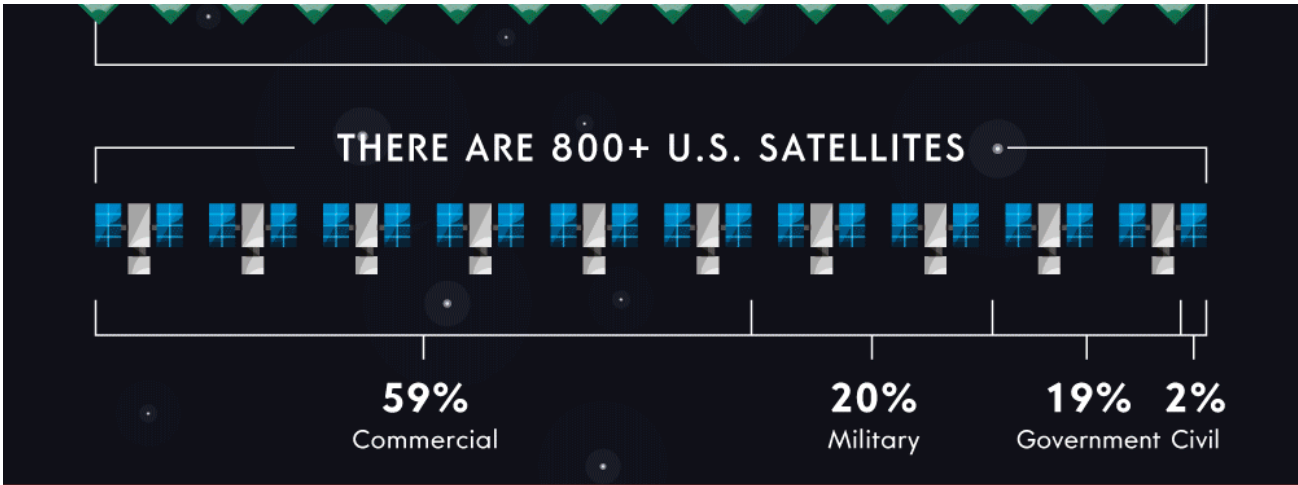
THOUSANDS OF SATELLITES ARE ORBITING THE EARTH

HOW ARE THEY BEING USED GLOBALLY?



GLOBAL SATELLITE INDUSTRY
GENERATED \$260.5 BILLION IN SALES IN 2016





WHAT COULD HAPPEN IF WE SUDDENLY LOST SATELLITE CONNECTION?



FINANCIAL MARKETS/INSTITUTIONS

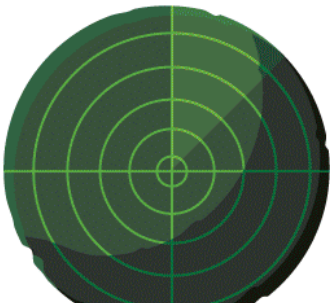
⚡ Within hours of losing satellites, stock exchanges and financial institutions dependent on **GPS time synchronization** will stop functioning properly or shut down entirely, **leading to stock market closures.**



MILITARY OPERATIONS DISRUPTED

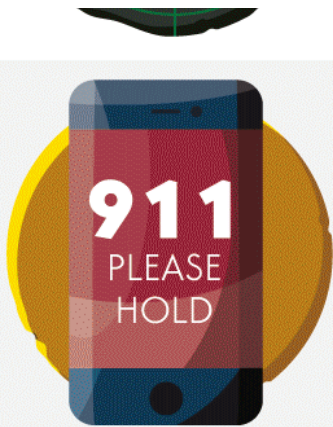
⚡ U.S. military personnel at sea, in the air and on missions across the globe will lose critical communication and navigation capabilities, **putting them and their missions at risk.**

⚡ As time passes, continued limitations on communications, navigation and intelligence gathering heightens global tensions and **increases chances for miscalculation and accidents.**





TRANSPORTATION MAYHEM

⚡ The loss of GPS navigation data puts passenger jets at risk as air traffic controllers revert to less efficient traffic management systems. In time, the **strain on the system forces airlines and airports to cancel flights.**




PUBLIC SAFETY RESPONSE SLOWS


 Systems to help 911 operators locate victims calling from cell phones disappears, making it **harder for first responders to locate victims.**

 Working without GPS, police, fire and EMS teams are **slower to find and respond to emergencies.**



ISOLATED POPULATIONS


 People working in remote locations such as aid workers, scientists, travellers and rural fisherman **will lose satellite phones that connected them to the world,** and hinder search and rescue operations in case of emergency.

 **Remote areas** dependent on satellites for Internet, TV and radio communications **will lose all connection with the outside world.**

Since 1982, satellites have been credited with supporting 41,000+ rescues worldwide, including 8,300+ in the United States and its surrounding waters

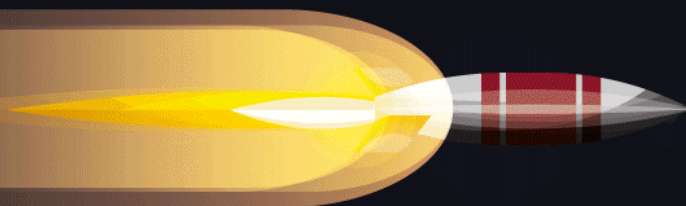


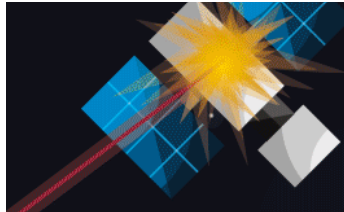
WEATHER FORECAST IMPLICATIONS

 Lack of an early warning system for hurricanes, tornadoes and other catastrophic weather events **prevents those at risk from evacuating in time.**

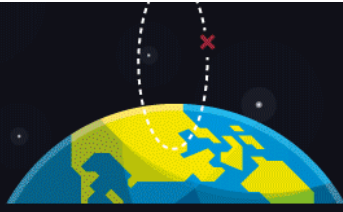
TOO MANY WAYS TO DISRUPT OUR SATELLITES

GUIDED MISSILES OR ROCKETS THAT COULD DIRECTLY STRIKE OR DETONATE A WARHEAD NEAR A SATELLITE






Lasers, high-powered microwaves, or electronic pulse weapons that could disrupt a satellite's electronics remotely



Electronic attacks could jam or spoof radio frequency signals to disrupt how satellites send and receive data



Cyber attacks could shut down or corrupt satellite data



THE DEBRIS AND ELECTROMAGNETIC PULSE FROM A SINGLE NUCLEAR TIPPED MISSILE, DETONATED IN ORBIT, COULD TAKE OUT DOZENS OF SATELLITES

CONFLICTS ON EARTH WILL MOVE TO SPACE

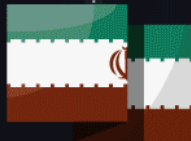
Other nations and non-state actors see our satellites as a vulnerability and are actively developing counterspace capabilities.



CHINA



RUSSIA



IRAN



NORTH KOREA



NON-STATE ACTOR



AMERICA'S SATELLITES ARE AT RISK OF ATTACK AND
WE MUST DO MORE TO PROTECT THEM.



SOURCES

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