# 1NC vs Sage MP

### 1NC – DA - XI

#### Xi is consolidating unprecedented political power – that’s only possible with strong PLA support

Chang 21 [(Gordon, columnist, author and lawyer, has given briefings at the National Intelligence Council, the CIA, and the State Department, JD from Cornell Law School) “China Is Becoming a Military State,” Newsweek, 1/14/2021] JL

At this moment, the Communist Party is taking back power from all others in society, including the State Council, and the military is gaining influence inside Party circles.

Why is the People's Liberation Army making a comeback? The answer lies in succession politics.

Xi Jinping was selected the top leader because he was not identified with any of the main factional groupings—like the Communist Youth League of Hu Jintao or the Shanghai Gang of Jiang—that dominated Party politics. Xi, in short, was the least unacceptable choice to the Party's squabbling factional elders.

Xi, once chosen, apparently decided that in order to rule, he needed a base, so he made certain officers the core of his support. As longtime China watcher Willy Lam told Reuters in 2013, Xi Jinping's faction is the military.

And with the help of the military, Xi has accumulated almost unprecedented political power, ending the Party's two-decade-old consensus-driven system and replacing it with one-man rule.

As Wang, a professor at the Georgia Institute of Technology, notes, Xi, with the amendments to the National Defense Law, is demonstrating his power of "leading everything and everyone." He is wrapping that effort in a "rule by law" move that is formalizing his perch at the top of the Chinese political system.

How is Xi using his newfound power? There is a hint in the National Defense Law amendments. These changes, Fisher tells us, "increase the powers of the CMC to mobilize the civilian sector for wartime and to better authorize the CMC to engage in foreign military exercises to defend China's 'development interests.'" As such, the changes "point to China's ambition to achieve 'whole nation' levels of military mobilization to fight wars, and give the CMC formal power to control the future Chinese capabilities for global military intervention."

"The revised National Defense Law also embodies the concept that everyone should be involved in national defense," reports the Communist Party's *Global Times*, summarizing the words of an unnamed CMC official. "All national organizations, armed forces, political parties, civil groups, enterprises, social organizations and other organizations should support and take part in the development of national defense, fulfill national defense duties and carry out national defense missions according to the law."

That sounds like Xi is getting ready to pick even more fights with neighbors—and perhaps the United States. On January 5, he ordered People's Liberation Army generals and admirals to be prepared to "act at any second."

Why would Xi want to start a war? "This is really indicative of there being instability in China, and Mr. Xi seeking to consolidate power around himself. ...The new National Defense Law essentially removes the alternative power base of the premier of the State Council, in this case Li Keqiang, from interfering with Mr. Xi's own power ambitions," said Charles Burton of the Ottawa-based Macdonald-Laurier Institute to John Batchelor, the radio host, earlier this month. As Burton noted, the amendments to the National Defense Law undermine Premier Li Keqiang, the head of the State Council and long-standing rival to Xi.

"I think this really gives the green light for him to dispatch the military on any pretext that he feels is necessary to defend his power," Burton says. "China is becoming a military state."

#### The plan alienates the PLA – they view satellite constellations as the linchpin of China’s legitimacy – specifically, public-private tech development is key

Economic Times 20 [(Economic Times, Indian daily newspaper, internally cites Dean Cheng, Senior Research Fellow at the Heritage Foundation and the Davis Institute for National Security and Foreign Policy, former analyst in the International Security and Space Program at the Office of Technology Assessment, BA in Politics from Princeton University) “China attempting to militarize space as it seeks to modernize its military power,” 8/31/2020] JL

The Jamestown Foundation, a US think-tank, hosted a webinar on August 19 entitled "China's Space Ambitions: Emerging Dimensions of Competition." One presenter, Dean Cheng, Senior Research Fellow at The Heritage Foundation, noted that Beijing's space programme is linked to China's central concept of comprehensive national power. "This is basically how the Chinese think about how they rack and stack, how they compare with other countries."

China recognises that military power is important, but it is not the only factor in being a great power. Cheng drew a parallel with the former USSR, where military power alone did not ensure survival of that communist state. Other comprehensive national power factors are political unity, economic power, diplomatic strength, science and technology, and even culture. "Space touches every one of these aspects in comprehensive national power, and that is a part of why Chinese see space as so important."

Indeed, a strong space industrial complex will generate benefits that ripple through the rest of China's economy. Furthermore, he said space achievements "promote pride within China, especially for the Chinese Communist Party (CCP) ... It's symbolic of how far China has come," he said, and "it gives the CCP legitimacy".

China is pushing into space services, including satellite launches, satellite applications and Earth observation/satellite imagery for others. Satellite customers include Belarus, Laos, Pakistan and Venezuela, for example, attracting hard currency and influence. Cheng said most underestimate the impact this has, as such countries grow almost totally dependent on Chinese equipment, assets and training over time. Incidentally, China could have manufactured back doors into these systems for foreigners to allow it access.

Mark Stokes, Executive Director at the US-based Project 2049 Institute think-tank, said in the same webinar that PLA requirements have always been fundamental to development of Chinese space capabilities. Potential PLA space missions in support of joint warfighting in a crisis include targeting (battlefield surveillance, electronic reconnaissance and ocean surveillance), communications, PNT services (obtaining target data, navigation information, navigation support and timing services), space jamming (encompassing space communications, radar, electro-optical and PNT) and space protection.

Stokes said the end of 2015 was "significant" for Chinese space efforts because consolidation of end-users under the PLA's Strategic Support Force (PLASSF) occurred, specifically within the Space Systems Department. In terms of developing and meeting requirements, the PLASSF is now "much more efficient," the American analyst posited.

Indeed, China created its space force in 2015, just a few months after Russia. After formally establishing its Space Force in December 2019, the US is still getting its equivalent off the ground. Cheng said both China and Russia have been pushing to militarise space, even though such a term is probably meaningless given that 95 per cent of space technology has dual applications for both military and civilian use. Certainly, outer space can no longer be viewed as a sanctuary.

Stokes said that "not much has changed really in terms of the space launch infrastructure and the launch, tracking and control of space ... but they are now integrated with end-users, and that is going to have an effect on making the whole system more efficient."

China has freedom of action in space, and the creation of the PLASSF and consolidation of space/counter-space research, development and acquisition, as well as training and operations, have benefitted from a single integrated command. The PLA's ability to interfere with American military operations in places like Taiwan will continue to grow yearly.

Cheng said, "The Chinese see future war as revolving around joint operations, which are not just land, air and sea forces." They also include the outer space and electronic warfare domains, which are necessary for information dominance." China, therefore, wishes to deny an adversary like the US the use of space, plus it needs to give the Chinese military every advantage.

China has therefore developed the ability to target hostile space-based assets (from the ground or space) and their all-important data-links. Indeed, jamming and electronic warfare complement anti-satellite weapons (which China has already tested), any of which can achieve effective mission kills against US and allied satellites. Stokes has not yet ascertained which agency is responsible for satellite kinetic kills, but it could well be the PLA Rocket Force, which is traditionally very tightly controlled by the Central Military Commission.

A detailed report entitled China's Space and Counter-space Capabilities and Activities, prepared for the US-China Economic and Security Review Commission, was published on March 30. Its authors, Mark Stokes, Gabriel Alvarado, Emily Weinstein and Ian Easton, summarised China's counter-space capabilities as follows.

"China has an operational counter-space capability that will evolve through 2020 and out to 2035. These capabilities include anti-satellite kinetic kill vehicles (KKV) and space electronic countermeasures ... On the non-kinetic side, the PLA has an operational ground-based satellite electronic countermeasures capability designed to disrupt adversary use of satellite communications, navigation, search and rescue, missile early warning and other satellites through use of jamming."

China obtained its first ground-based satellite jammers from Ukraine in the late 1990s, but it has developed its own solutions since then. "The PLA is capable of carrying out electronic countermeasures to disrupt, deny, deceive or degrade space services. Jamming prevents users from receiving intended signals and can be accomplished by attacking uplinks and downlinks.

The PLA and defence industry are developing and deploying jammers capable of targeting satellite communications over a large range of frequencies, including dedicated military communication bands. The PLASSF also has advanced cyber capabilities that could be applied in parallel with counter-space operations."

Nonetheless, the report asserted that the US still assumed a technological lead in space.

"China also is carrying out research, development and testing on potential space-based counter-space systems. The PLASSF and defense industry have carried out advanced satellite maneuvers and are likely testing orbital technologies that could be applied to counter-space operations." The PLASSF Network Systems Department probably oversees satellite jamming operations.

#### 1AC evidence makes it clear this is a huge PLA investment –

Chow ’17 - independent policy analyst with over 25 years as a senior physical scientist specializing in space and national security. He holds a PhD in physics from Case Western Reserve University and an MBA with distinction and PhD in finance from the University of Michigan. Brian G Chow, “Stalkers in Space:  Defeating the Threat,” Strategic Studies Quarterly 11, no. 2 (Summer 2017): 82-116, <https://www.airuniversity.af.edu/Portals/10/SSQ/documents/Volume-11_Issue-2/Chow.pdf>.

The United States has 554 operational satellites, the largest number of satellites among all countries and organizations in the world (see table 1).1 While these space capabilities offer great advantages for the US military, they simultaneously create great vulnerabilities. The Department of Defense (DOD) is increasingly concerned, particularly about the space threat from China. In its annual reports to Congress, Military and Security Developments Involving the People’s Republic of China for 2013,2 2014,3 2015,4 and 2016,5 the DOD has warned repeatedly: “PLA [People’s Liberation Army] writings emphasize the necessity of ‘destroying, damaging, and interfering with the enemy’s reconnaissance . . . and communications satellites,’ suggesting that such systems, as well as navigation and early warning satellites, could be among the targets of attacks designed to ‘blind and deafen the enemy.’ ” Gen John Hyten, the former head of Air Force Space Command, said without space assets, the United States would be forced to revert to industrial age warfare: “It’s Vietnam, Korea and World War II”—no more precision missiles and smart bombs.6 Hyten was also quoted as saying that “China will soon be able to threaten US satellites in every orbital regime, from low Earth orbit a few hundred miles above the Earth, to geosynchronous orbit more than 20,000 miles up—where some of the military’s most important satellites circle the Earth. . . . Now we have to figure out how to defend those satellites.”7

#### That factionalizes the CCP and emboldens challenges to Xi – the PLA is increasingly powerful and not unconditionally subservient

Simpson 16 [(Kurtis, Centre Director with Defence Research and Development Canada, has been conducting research on China’s leadership, Communist Party politics, the People’s Liberation Army and foreign policy for over 30 years,Master’s Degree and a Ph.D from York University, previously served as an intelligence analyst at the Privy Council Office and leader of the Asia Research Section at the Department of National Defence’s Chief Defence Intelligence (CDI) organization) “China’s Re-Emergence: Assessing Civilian-Military Relations In Contemporary Era – Analysis,” Eurasia Review, 12/21/2016] JL

Paralleling divided loyalties between Chinese Party, military and government bodies, one must also recognize that within each, factions exist, based upon generational, personal, professional, geographic, or institutional allegiances.19 These minor fault lines are most pronounced during crises, and they continue independent of professionalization.20 As was demonstrated by the civil-military dynamics of the Chinese government’s suppression of student demonstrators, both divisions and allegiances of interests emerged with respect to how to contain this situation and factional interests largely determined which troops would carry out the orders, who commanded them, what civilian Party leaders supported the actions, and who would be sanctioned following the mêlée. A consequence of factionalism within the PLA is that the Party’s control mechanisms (particularly because rule of law and constitutional restraints on the military are weak) needs to be robust to control not only a single military chain of command but (particularly during crises) perhaps more than one. This is not likely the case. A review of the evidence indicates the military’s influence, on the whole, is increasing, and the Party’s control decreasing.

On one level, the Party clearly controls the military as the Central Military Commission or CMC (the highest military oversight body in the PRC) is chaired by a civilian, President Xi Jinping. Moreover, the PLAs representation on formal political decision-making bodies (such as the Politburo Standing Committee, the Politburo, the Central Committee, and the NPC) has decreased over the years, but this does not necessary equate to a reduced level of influence. For example, the two Vice-Chairman of the CMC are now military generals, as are the remaining other eight members. Irrespective of institutional membership, military leaders retain considerable say. Personal interactions and informal meetings with senior party elites provide venues to sway decisions. They do, also, hold important places on leading small groups dedicated to issues like Taiwan and other security questions, such as the South China Seas.21

In a similar vein, other methods of Party influence, as exercised through political commissars, party committees, and discipline inspection commissions are no longer empowered to enforce the ideological dictates of a paramount leader. In the face of diffuse reporting chains, competing allegiances, and often effective socialization by the military units they are supposed to be watching over, most do not provide the Party guardian and guidance function once so pervasive.

While perhaps overstated, Paltiel’s observation that “…China’s energies over the past century and half have given the military a prominent and even dominant role in the state, preempting civilian control and inhibiting the exercise of constitutional authority” is likely now truer than ever before in history.22 While still loyal to the party as an institution, the PLA is not unconditionally subservient to a particular leader and retains the resources to enter the political arena if (at the highest levels) a decision is made to do so.

The civilian-military trend lines evident in China since the end of the Cultural Revolution affirm that the symbiotic nature of the Party-PLA relationship has morphed in important respects since the late 1960s. The promotion of professionalism, a reduced role for ideological indoctrination, an increasing bifurcation of civil-military elites, and growing state powers (complete with divided loyalties and continued factionalism) has complicated the political landscape informing how the CCP interacts with the PLA. If, as postulated, we have moved from a fused, ‘dual role elite’ model to one of ‘conditional compliance’ in which the military actually holds a preponderance of the power capabilities and where its interests are satisfied through concessions, bargaining, and pay-offs, empirical evidence should reflect this. A review of China’s three major leadership changes since the transition from the revolutionary ‘Old Guard’ to the modern technocrats confirms this.

Formally anointed and legitimized by Deng in 1989, Jiang assumed leadership without military credentials and few allies, viewed by many as a ‘caretaker’ Party Secretary in the wake of the Tiananmen Massacre. Despite his limitations, Jiang was well versed in the vicissitudes of palace politics. Informed by a high political acumen, he immediately promoted an image as an involved Commander-in-Chief, personally visiting all seven military regions, a sign of commitment not made by either the likes of Mao or Deng. Symbolic gestures like this were bolstered by his providing incentives to the PLA, such as: consistent raises in the defence budget; funds for military modernization; as well as equipment, logistics, and augmented R&D.23

Referred to as the ‘silk-wrapped needle,’ Jiang marshalled Party resources to not only reward, but to punish.24 His institutional authority over appointments enabled him to manipulate factions, dismiss those who opposed him, enforce new rigid retirement standards, and promote loyalists. A delicate equilibrium was established during the early-1990s until his semi-retirement in 2004,25 where Jiang guaranteed military priorities such as supporting ‘mechanization’ and an ‘information-based military’ (promoting the concept of RMA with Chinese characteristics) in exchange for the PLA backing of his legacy contributions to Marxist Leninist Mao Zedong thought with the enshrinement of his “Three Represents” doctrine.

Like Jiang, Hu Jintao’s succession was the product of negotiation, compromise, and concessions. While neither opposed by the PLA, nor supported by the military ‘brass,’ Hu was a known commodity, having served as Vice-President (1998) and CMC Vice-Chairman since 1999. He was deemed acceptable until proven otherwise. In the shadow of Jiang (who retained the position of CMC Chair until 2004), Hu did not exert the same kind of influence in, nor engender the same kind of deference from, China’s military, but equally proved capable of fostering a pragmatic relationship with the army which ensured its interests, and in so doing, legitimized his leadership position.

Ceding much of the military planning and operational decisions to the PLA directly, Hu played to his strengths and focused upon national security issues (such as the successful resolution of SARs in China), which bolstered his credibility as a populist leader among the masses, indirectly increasing his power within both the military and the Party. Additionally, he focused upon foreign military security affairs (most notably, North Korea-US negotiations), which enabled him to link his personal political agenda with the military’s latest ambitions.

In according the military a distinct place in China’s national development plan, supporting China’s rise, and ensuring its vital interests, Hu recognized the military’s evolving requirement to ‘go global’ and its worldwide interests in non-combat operations, such as peacekeeping and disaster relief, as well as stakes in the open seas, outer space, and cyberspace as interest frontiers with no geographic boundaries.26 Under the slogan of ‘China’s historical mission in the new phase of the new century’ and his acquiescence to the PLA’s stated requirements ‘to win local wars under modern conditions’ by funding new technology acquisition, Hu received the army’s formal recognition for his contributions to military thought based upon “scientific development” which informed a “strategic guiding theory,” resulting in a new operational orientation for China’s military. Emulating his predecessor, Hu won ‘conditional compliance’ from the PLA by successfully bartering military needs and wants for the army’s support and endorsement of his political tenure. This was not done outside of self-interest. Hu, as did Jiang, skillfully coopted, fired, and promoted select Generals to serve his greater ends, and he did this through varied means. Ultimately, however, it was done in a manner acceptable to the military.

Xi Jinping’s rise to power in 2012, while replicating the ‘horse-trading’ of Jiang and Hu, marks a fundamental departure in leadership style. Often described as a transformative leader, Xi is openly critical of his predecessors and rails against earlier periods where reform stalled and corruption grew.27 An advocate of ‘top-level design,’ incrementalism is being supplanted by a massive attempt to centralize all aspects of the CCP’s power, which includes a major restructuring of the economy, government, administration, and military.

Nicknamed “the gun and the knife” as a slight for his attempts to simultaneously control the army, police, spies, and the ‘graft busters,’ Xi’s power appears uncontested at present. Nevertheless, he is also viewed as ‘pushing the envelope too far’ and endangering the equilibrium which has been established between the Party and PLA over the past 25 years. For example, only two years into his mandate, he fostered a Cult of Personality, “the Spirit of Xi Jinping” which was officially elevated to the same standing as that of Mao and Deng, by comparison, foundational figures in Chinese history. His open attacks of political ‘enemies’ (most notably Zhou Yongkang, a Politburo Standing Committee member and former security czar) breeds fear among almost every senior official, all of whom are vulnerable on some point. Equally true, an unprecedented anti-corruption campaign is inciting comrades to turn on comrades, not unlike a massive game of prisoner’s dilemma.

Nowhere is the pressure for reform greater than in the PLA. Xi advocates administering the army with strictness and austerity, promoting frugality and obedience. At his direction, “mass-line educational campaigns” designed to “rectify work style” through criticism and self-criticism are being implemented.28 Ideological and political building is now equated with army building, as a means of ensuring the Party’s uncontested grip over the troops ideologically, politically, and organizationally. Select military regions (those opposite Taiwan and adjacent to the South China Seas) and commanders from those regions are witnessing favoritism and promotion at the expense of others. Moreover, a new “CMC Chairmanship Responsibility System” has been instituted, which directly calls into question the support of some of Xi’s senior-most generals.

A ‘hardliner’ by nature, Xi recognizes that he must earn the support of the PLA. New military priorities he supports include: accelerating modernization; Joint Command and C4ISR; training; talent management, as well as equipment and force modernization. That said, his goal of achieving the Chinese dream of building a “wealthy, powerful, democratic, civilized, and harmonious socialist modernized nation” by 2021, the 100th anniversary of the founding of the CCP, is exceptionally ambitious. It will require endless commitments to competing interests in a period of economic stagnation and global economic downturn. Should the PLA come to believe they are not first in line for government largess, support for Xi could erode very quickly.29

#### CCP instability collapses the international order – extinction

Perkinson 12 [(Jessica, MA in international affairs from American University) “The Potential for Instability in the PRC: How the Doomsday Theory Misses the Mark,” American University School of International Service, 2012] JL

Should the CCP undergo some sort of dramatic transformation – whether that be significant reform or complete collapse, as some radical China scholars predict2 – the implications for international and US national security are vast. Not only does China and the stability of the CCP play a significant role in the maintenance of peace in the East Asian region, but China is also relied upon by many members of the international community for foreign direct investment, economic stability and trade. China plays a key role in maintaining stability on the Korean Peninsula as one of North Korea’s only allies, and it is argued that instability within the Chinese government could also lead to instability in the already sensitive military and political situation across the Taiwan Strait. For the United States, the effect of instability within the CCP would be widespread and dramatic. As the United States’ largest holder of US treasury securities, instability or collapse of the CCP could threaten the stability of the already volatile economic situation in the US. In addition, China is the largest trading partner of a number of countries, including the US, and the US is reliant upon its market of inexpensive goods to feed demand within the US.

It is with this in mind that China scholars within the United States and around the world should be studying this phenomenon, because the potential for reform, instability or even collapse of the CCP is of critical importance to the stability of the international order as a whole. For the United States specifically, the potential - or lack thereof - forreform of the CCP should dictate its foreign policy toward China. If the body of knowledge on the stability of the Chinese government reveals that the Chinese market is not a stable one, it is in the best interests of the United States to look for investors and trade markets elsewhere to lessen its serious dependence on China for its economic stability, particularly in a time of such uncertain economic conditions within the US.

#### Independently, Xi will lash out to preserve cred in the SCS – US draw-in ensures extinction

Mastro 20 [(Oriana Skylar, Assistant Professor of Security Studies at Georgetown University's Edmund A. Walsh School of Foreign Service, Resident Scholar at the American Enterprise Institute) “Military Confrontation in the South China Sea,” Council on Foreign Relations, 5/21/2020] JL

The risk of a military confrontation in the South China Sea involving the United States and China could rise significantly in the next eighteen months, particularly if their relationship continues to deteriorate as a result of ongoing trade frictions and recriminations over the novel coronavirus pandemic. Since 2009, China has advanced its territorial claims in this region through a variety of tactics—such as reclaiming land, militarizing islands it controls, and using legal arguments and diplomatic influence—without triggering a serious confrontation with the United States or causing a regional backlash. Most recently, China announced the creation of two new municipal districts that govern the Paracel and Spratly Islands, an attempt to strengthen its claims in the South China Sea by projecting an image of administrative control. It would be wrong to assume that China is satisfied with the gains it has made or that it would refrain from using more aggressive tactics in the future. Plausible changes to China’s domestic situation or to the international environment could create incentives for China’s leadership to adopt a more provocative strategy in the South China Sea that would increase the risk of a military confrontation.

The United States has a strong interest in preventing China from asserting control over the South China Sea. Maintaining free and open access to this waterway is not only important for economic reasons, but also to uphold the global norm of freedom of navigation. The United States is also at risk of being drawn into a military conflict with China in this region as a result of U.S. defense treaty obligations to at least one of the claimants to the contested territory, the Philippines. China’s ability to control this waterway would be a significant step toward displacing the United States from the Indo-Pacific region, expanding its economic influence, and generally reordering the region in its favor. Preventing China from doing so is the central objective of the U.S. National Security Strategy and the reason the Indo-Pacific is the U.S. military’s main theater of operations. For these reasons, the United States should seek ways to prevent Chinese expansion, ideally while avoiding a dangerous confrontation and being prepared to deftly manage any crises should they arise.

China considers the majority of the South China Sea to be an inalienable part of its territory. Exercising full sovereignty over this area is a core component of President Xi Jinping’s “China Dream.” China does not accept or respect the sovereignty claims of Brunei, Indonesia, Malaysia, the Philippines, Taiwan, or Vietnam in this region. Although China has been cautious in pressing its claims thus far, three developments could convince Xi that China should be more assertive.

Xi could feel compelled to accelerate his timeline in the South China Sea to maintain his consolidated position within the Chinese Communist Party (CCP), particularly if the political situation in Hong Kong worsens, peaceful reunification with Taiwan becomes less likely, or domestic criticism of his management of the novel coronavirus outbreak increases. With China’s economic growth for 2020 projected to hit only 1.2 percent—the lowest since the mid-1970s—Xi could find it necessary to demonstrate strength while Beijing deals with internal fallout from the pandemic. China has already declared two new administrative districts in the South China Sea in April 2020 and has escalated its criticism of U.S. freedom of navigation operations (FONOPs) in the area. Moreover, with expectations that the first stage of China’s military modernization efforts will be completed in 2020, Xi could become more confident that China would succeed in pressing its claims militarily, especially if the United States is distracted internally with managing the coronavirus pandemic or its aftermath.

### 1NC – DA – Broadband

#### Starlink is key to rural broadband expansion

Weinschenk 2/25 [(Carl, IT and telecom journalist for Telecompetitor, Teleco Transformation, and IT Business Edge) “Report: Starlink Looks Very Promising for Rural Broadband,” Telecompetitor, 2/25/2021] JL

SpaceX’s Starlink satellite broadband service has the potential to be a game changer for rural broadband, according to an analysis by PCMag of Starlink speeds. The analysis is based on beta tester data exclusively provided to it by Ookla Speedtest.

The site looked at data from rural, suburban and urban areas. Among its more than 10,000 users in its semi-public beta were “a perplexing” number in urban and suburban areas where a variety of high-speed options already are available. The story cites Chicago, Seattle and Minneapolis as places where there were testers, despite readily available alternatives.

The site compared download speeds against other fixed service providers in 30 counties with at least 30 samples in any month from December 30 to February 24. The counties in which the fixed providers had the biggest speed advantage over Spacelink were urban or suburban: Los Angeles and Santa Clara counties, CA; Cook County, IL; King County, WA and Washington County, MN.

It is in rural areas that Starlink shines, according to the research. The five counties in which Starlink had the biggest download speed advantage over the fixed group were rural: Vilas County, WI; Ravali County, MT; Waldo County, ME; Okanogan County, WA and Lamoile County, VT.

The number of counties in which Starlink beat the fixed providers and those in which the fixed providers beat Starlink appeared to be about equal, as was the speed differential.

“Our own analysis shows that Starlink will make the biggest difference in rural, low-density, low-population counties with few options other than lower-quality satellite services,” wrote Sascha Segan, author of the PCMag article about Startlink rural speeds.

#### Broadband is key to precision agriculture transition

ABI 19 [(American Broadband Initiative, a leading force in driving changes across Federal Agencies to identify and remove barriers to broadband access and leverage public assets and resources to expand our Nation’s broadband infrastructure capacity.) “A Case for Rural Broadband,” The United States Department of Agriculture, 4/2019] BC

HOW E-CONNECTIVITY WILL TRANSFORM THE BUSINESS OF AGRICULTURE

Across the agricultural production cycle, farmers and ranchers can implement digital technologies as other modern businesses are doing, enhancing agriculture by driving decision-making based on integrated data, automating processes to increase operational efficiency, improving productivity with tasks driven by real-time insights, augmenting the role of management in the business of farming, and creating new markets with extended geographic reach.

These patterns of digital transformation create fundamental shifts in agricultural production, developing new ways of working that make the industry more productive, attractive, and financially sustainable for farmers and ranchers. Tech companies which stand to benefit from industry transformation continue to capitalize on these shifts by developing new technologies, which according to one recent study, may help position themselves to capture a portion of an estimated $254 billion to $340 billion in global addressable digital agriculture market.13

BUSINESS MANAGEMENT shifts decisionmaking from instinct to integrated data

Precision Agriculture is transforming the way producers collect, organize, and rely on information to make key decisions. Traditionally, producers’ long-term experiences have created a competitive advantage: years of experiments have produced insights and instincts about the land they have farmed and the animals they have raised. But the volume of data that is possible

to collect today can accelerate that learning curve, helping producers learn faster and more rapidly adapt to market shifts—particularly on new fields and with new animals—and creating more nuanced insights, enabling them to act on leading indicators. This creates a disparity between producers who can utilize high-speed Internet service and those who cannot. Examples include the ability to do the following:

create decision tools to help farmers and ranchers estimate the potential profit and economic risks associated with growing one particular crop over another • decide which fertilizer is best for current soil conditions • apply pesticides in targeted areas of the field, to control pests rather than applying pesticides over the entire field • use limited water resources more effectively • respond to findings of sensors that monitor animal health and nutrition

Better choices about what, where, and when to plant, fertilize, and harvest—or breed, feed, and slaughter—can drive above-average returns by removing unrecognized inefficiencies and scaling insights.

DIGITIZATION shifts supply chain management and resource allocation from generic to precise

Precision Agriculture helps make the business of farming more efficient by minimizing inputs— such as raw materials and labor—and maximizing outputs.

For example, previous research has found that 40 percent of fields are over-fertilized, which not only inflates the cost of inputs but also results in 15 percent–20 percent yield loss suffered from improper fertilizer application.14 Precise application of inputs, such as fertilizer, herbicides, and pesticides, allows farmers to adjust inputs to location-based characteristics and use exact amounts needed, which saves money and increases sustainability due to more efficient resource stewardship. Improved fertilizer, soil, and water use can significantly improve water quality with less runoff and reduce climate gas emissions, which is important since agriculture accounts for 10-15 percent of worldwide emissions.15 Despite reductions in necessary inputs, Next Generation Precision Agriculture helps maintain or increase yields, leading to significant gains in efficiency14.

Real-time insights also improve logistics. When growing melons, for instance, real-time data can help farmers overcome challenges in storing and shipping their products. Melons should be stored in an optimal refrigeration environment to minimize spoilage, and real-time precision sensors can reduce spoilage by alerting staff to suboptimal variations in temperature and humidity, allowing the execution of remedies before major losses occur. When refrigerated storage is full or the market price is at a peak, the “Internet of Things” can provide real-time information about where trucks are located and locating customers to market products to help make the sale.

LABOR EFFICIENCY boosts productivity by automating routine processes and enabling real-time response

Connected devices equip farmers with a clear picture of their operations at any moment, making it possible to prioritize tasks more effectively and triage the most pressing issues. While routine inspection and scouting has typically been a regular part of farm management and has increased farm profitability14, connected technologies can track, sense, and flag where a producer should focus their time and attention that day. Similarly, e-connectivity has allowed rural farms to access new training resources and high-skilled labor that has not been previously available.

#### Food insecurity causes state collapse, nuclear war, and terror – extinction

DeFeo 17 [(Michael, Regional Organizing Director at Arizona Democratic Party who graduated in 2019 with a bachelor’s degree in political science from Gettysburg College) “Food Insecurity and the Threat to Global Stability and Security in the 21st Century” Inquires Journal, 2017] BC

Poor Institutional Capacity

Although the developed world experiences food insecurity, it is the lack of infrastructure and government institutions in developing countries that contribute to civil wars and state fragility. Foreign exchange shortages can provoke food and fuel scarcities that force governments to spend less on essential services and public goods. Accordingly, citizens see their medical and educational entitlements melt away. Such circumstances create breeding grounds for internal conflict.

All violent conflicts destroy land, water, and social resources for food production. Developing countries do not have massive industrial machines that can remedy such losses, therefore, the population will suffer. Food insecurity is a recruitment tool for violent extremist groups. Promising food and water to a starving population, especially in urban areas, makes recruiting young and disgruntled youth easier (Messer & Cohen, 2015). Syria had limited institutional capacity to deal with the mass displacement, and that lead to a civilian revolt and recruitment into the Islamic State.

Countries that fail to provide their people with basic services often experience gross economic inequality, and even human-rights violations, as was the case in both Syria and Sudan. Both countries are classified as Least Developed Countries (LDCs). LDCs are distinguished not just by their widespread poverty, but also by their structural weaknesses in economic, institutional, and human resources that make them unable to maintain stability during a drought. The combination of drought and political instability or violence led to famine in Somalia (another LDC) in 2011. Even with urgent humanitarian action, the country still plunged into chaos and violence (Messer & Cohen, 2015). Severe drought, like Somalia's, may result in crop failure in major food producing areas, which in turn is a significant threat to social stability and peace (Wischnath, 2014).

Sometimes droughts of exceptional severity (and the civil unrest that follows) are attributed to climate change, especially in particularly arid regions. Scholars are divided on whether climate change actually impacts civil conflict. That is why African countries like Somalia and Sudan are prime case studies. Africa has the lowest percentage of irrigated land in the world. Agriculture is the most important sector of most African countries. Very high percentages of civilians in African countries live in rural areas. Those characteristics combined with low economic and state capacity make African, particularly sub-Saharan African countries the most vulnerable to climate change and civil instability. Africa experiences more civil conflict than other parts of the world, therefore, it is possible to argue that a lack of climate variability effect on civil conflict in Africa would make it unlikely to cause civil conflict in other parts of the world (Koubi et al., 2012). Secretary-General of the United Nations, Ban Ki-moon attributed the conflict in Darfur to an ecological crisis arising “at least in part from climate change” (Ki-moon, 2007). The Fourth Report of the Intergovernmental Panel on Climate Change assessed that climate change will continue to worsen. As it does, it will increase food shortages, which may lead to conflict (AR4, 2007). The report also stated that forced displacement and rising social instability is the most likely result of food insecurity. This is almost exactly what happened in Syria. The first step towards conflict might be food riots, which often occur during a food shortage or when there is an unequal distribution of food. These are usually caused by food price increases, food speculation, transport problems, or extreme weather. In 1977, Egyptians became so desperate for food that they attacked shops, markets, and government buildings just to obtain bread and grain (Paveliuc-Olariu, 2013).

Moreover, civil war can create economic opportunities for certain groups, so they try to avoid resolving the conflict. Urban elites in Somalia profited tremendously off of internal conflict because of the absurd amount of foreign aid that was pumped into the country and then largely stolen (Shortland, Christopoulou, & Makatsoris, 2013). Once a country experiences a food shortage, it may lead to protests, riots, and violence. This all contributes to state instability, but it is not the state alone that suffers. If one country fails, it creates a crisis that could destabilize an entire region.

State Failure and the Threat to Regional Stability

Although fragile governments in developing countries are at a heightened risk for internal conflict that could topple them, that risk also threatens the country’s neighbors. After the Soviet Union collapsed in 1991, Afghanistan found itself alone in regional trade. Without a guaranteed source of cereal, the government had to turn to Iran and Pakistan for support in order to avoid its own collapse (Clarke, 2000). Unlike Afghanistan, many other developing countries have been unable to work together on food and water security. Thirteen of the twenty-two members of the Arab League rank among the most water-scarce nations on the planet. Food cannot be grown without water. The majority of the world is engaged in some sort of agreement with neighboring countries to share water supplies, but thirty-seven countries still do not share their water resources (El Hassan, 2014). Lack of cooperation can cause civil as well as interstate conflict. South Sudan legally has no share of the Nile River and the effects of that lack of water access have been mass starvation and violence.

The effects of climate change, water shortages, and mass migrations have resulted in acute food insecurity not just in Syria, but across the region (El Hassan, 2014). Food insecurity, plus an increase in the prices of staple foods have destabilized much of the area. The Arab Spring was the beginning of multiple conflicts that have affected countries like Syria, Egypt, and Libya. In Syria, food insecurity resulted in mass violence and has now created an international crisis involving multiple world powers.

Food insecurity is such a threat to entire regions because people cannot live without food and people want to live. When a region experiences food scarcity and that population feels threatened by hunger, it will relinquish dependency on any political authority and take up arms in order to ensure its well-being (Paveliuc-Olariu, 2013). This is human survivalism. It is important for developing countries in areas that are at risk for food insecurity to formulate policy that ensures aid goes to the food insecurity hotspots so as to maintain stability.

South Sudan experienced what happens when countries do not work together to feed their people. After gaining its independence from Sudan in 2011, 360,000 South Sudanese refugees returned to the country. This influx of human beings, coupled with drought conditions exacerbated economic strain and drove food prices up. The increases were the result of trade restrictions between Sudan and South Sudan. The overall reason for the food crisis, however, was the government's preoccupation with fighting a political and quasi-ethnic civil war rather than negotiating fair access to the Nile River (Tappis et al., 2013). Because of South Sudan’s weak institutions, it has done little to address the food shortage. That inability to solve the problem fuels insurgent recruitment that continues the bloodshed in South Sudan. The conflict is keeping regional rivalries alive with Uganda, Kenya, Ethiopia, and Sudan; all of whom have attempted to intervene in South Sudan militarily to bring about stability (Council on Foreign Affairs 2016). Aside from South Sudan, multiple conflicts across Africa are consuming massive amounts of diplomatic, political, and humanitarian resources in a region that faces a multitude of threats.

South Sudan, Somalia, and Syria are all failing states that are experiencing huge food shortages, humanitarian crises, and most importantly, extreme civil violence. South Sudan is mired in a civil war. Somalia is controlled by warlords and terror organizations. Syria has both of those problems. Conflict has turned these countries into “breeding grounds of instability, mass migration, and murder” rather than sovereign states with a monopoly on violence and control over their borders (Rotberg, 2002). To be sure, failing states are a concern because of their ability to destabilize entire regions, but states at risk for failure are also very important. Countries like Pakistan that are politically unstable and have food and water shortages could result in uncontrollable civil upheaval (The Fund for Peace, 2016).

Global Consequences of State Failure

Failing states and destabilized regions are not just a problem for the developing world. They are a very real concern for the United States and other developed countries as well. The Islamic State fed off of the Syrian Civil War and helped destabilize Iraq, Syria, Libya, and even Afghanistan and the Philippines. They have at also inspired terror attacks in Europe and the United States. They are a threat to both the developed and developing world. State instability allows them to recruit and train without government interference, which in turn allows them to plan attacks outside the region. An important source of income for the Islamic State has been agriculture from Iraq and Syria. While this revenue has received less media attention than oil extraction, it is still an important part of their economy (Jaafar & Woertz, 2016). It is also a key aspect of their political legitimacy because it allows them to feed their soldiers and those they control. Controlling some of the most fertile regions of the two countries has also helped the Islamic State starve off areas that have resisted them (Jaafar & Woertz, 2016). If Syria or Iraq are ever going to stabilize, those breadbaskets must be retaken and the food must reach the civilians in the cut off areas.

In the 20th century, state failure had few implications for international peace and security. Thanks to globalization, that is no longer the case. Failed states pose a threat to themselves, their neighbors, and the entire international community (Rotberg, 2002). Islamic State - inspired terror attacks in Belgium and France are a direct result of state collapse in Syria and Iraq. Preventing states from failing, rather than having to intervene militarily when they do, ought to be a top priority in the foreign policy of rich nations. Although the situations in Syria, Somalia, and South Sudan seem beyond repair, nation-building projects have had success in the past. Tajikistan, Lebanon, Cambodia, Kosovo and East Timor are all examples of relatively successful attempts to put failing states back on the right track (Rotberg, 2002). Developed countries must have the political will to ensure that people in developing countries are fed so that they remain pacified. It is often severe food insecurity that precedes ethnic or religious violence, as has been the case in South Sudan, therefore, adequate food is paramount to avoiding humanitarian crises that accompany ethnic and sectarian conflict (The Economist, 2016).

While it is true that many developed countries, especially the United States, are weary of providing so much financial aid and intervening militarily in war-torn, developing countries, it is imperative that the rich do not abandon the poor to a fate of internal destruction. Money must not be thrown blindly towards humanitarian crises and military intervention must be the last resort. Developed countries provided $1.4 billion for humanitarian aid in South Sudan in its first year of independence, but without specific conditions, that money went to kleptocrats rather than infrastructure projects or public services (The Economist, 2016).

Paying to help developing nations is expensive and will continue to be so. Afghanistan and Iraq are proof of that. But the war on terror, repeated military intervention, and humanitarian aid are expensive as well. In 2002, Robert Rotberg suggested that a new Marshall Plan was required for places like Afghanistan, the DRC, Sierra Leone, Somalia, and Sudan. If it is true that food and water security are the keys to keeping relative peace in new and developing countries and their collapse threatens the safety of the developed world, it seems logical that assisting those countries is wise.

In 1999, Susan L. Woodward argued that military leaders focus too much on force versus force combat rather than the issues of insurgency and terrorism in failed states. In 2017, military leaders have adjusted their strategies accordingly. Woodward believed that globalization made states less important, but their failure would still be felt around the world. Failed states cannot exercise their monopoly on violence and they cannot control their borders, thus threatening more than just the failed state (Woodward, 1999). Because state failure is so consequential, the United States military must continue to look into measures it can take to prevent it.

The Threat of the Future

Finally, the threats from food shortages in South Sudan, Somalia, Afghanistan, Iraq, and Syria are important to the United States and the international community at large, but there is one country that, while it is not a failing state right now, could easily become one if the wealthy nations of the world do not ensure its stability. That country is Pakistan. The Fund for Peace ranked Pakistan as the 14th most fragile state in the world in 2016, giving it a “High Alert” designation for state failure (The Fund for Peace, 2016). Its Demographic Pressure Indicator was an 8.9 - 10.2 Although it improved by one-tenth of a point last year, its decade trend is worse by seven-tenths of a point and its five-year trend is worse by four-tenths of a point, suggesting that the food situation is actually worsening overall (The Fund for Peace, 2016). If internal conflict and potential state failure at its most basic level begins with food and water insecurity, then Pakistan could become a real problem very soon.

Considering the risk of state failure, Pakistan poses the greatest threat to the rest of the world because of the existence of nuclear weapons within the country. Pakistan is not a member of the Nuclear Non-Proliferation Treaty, yet it has about 120 nuclear weapons. It also has a Shaheen 1A ballistic missile that can reach targets 550 miles away (Pakistan Defence, 2015). Should a food crisis arise in Pakistan that results in civil war and governmental collapse, those weapons could end up in the hands of a group that intends to use them maliciously as an act of terror. That prospect should be incentive enough for the developed countries to realize that they cannot and must not leave food insecure countries to devour themselves.

While it is difficult to argue that food insecurity immediately and directly causes civil conflict, there is no denying that people need food and water and will fight to survive. In South Sudan, ethnic and political armies fight one another. In Syria, rebels and government forces fight each other while also fighting the Islamic State. And in Somalia, warlords and their armies fight. The Syrian Civil War began six years ago after a water shortage forced thousands of migrants into urban centers. Developing countries tend to be most affected by climate change, poor governance, and food price increases. Therefore, they are the most prone to instability that may lead to outright violence. Without the wherewithal to handle civil conflict, these countries may become fragile or even failing states. Once that happens, they represent a threat not just in their region of influence, but the whole world. That is why the developed Western nations must pay attention and provide aid to the developing world in order to maintain stability. There will be more food crises in developing countries in the future, but if the North has the strength to continue aiding the South, perhaps it will be able to curb mass starvation and avoid the horrendous violence that consumes starving countries.

#### Unproductive agriculture is the largest threat to global biodiversity

Aldred 16 [(Jessica, the deputy and production editor of theguardian.com/environment and writes on wildlife and conservation.) “Agriculture and overuse greater threats to wildlife than climate change – study”, The Guardian 8/10/2016] BC

Agriculture and the overexploitation of plants and animal species are significantly greater threats to biodiversity than climate change, new analysis shows.

Joint research published in the journal Nature on Wednesday found nearly three-quarters of the world’s threatened species faced these threats, compared to just 19% affected by climate change.

It comes a month before the International Union for Conservation of Nature (IUCN) hosts its annual summit in Hawaii to set future priorities for conservation.

The team from the University of Queensland, the Wildlife Conservation Society (WCS) and the IUCN assessed 8,688 near-threatened or threatened species on the IUCN’s “red list” against 11 threats: overexploitation, agricultural activity, urban development, invasion and disease, pollution, ecosystem modification, climate change, human disturbance, transport and energy production.

It found that 6,241 (72%) of the studied species were affected by overexploitation – logging, hunting, fishing or gathering species from the wild at rates that cannot be compensated for by reproduction or regrowth.

These included the Sumatran rhinoceros, western gorilla and Chinese pangolin – all illegally hunted for their body parts and meat – and the Bornean wren babbler, one of 4,049 species threatened by unsustainable logging.

Some 5,407 species (62%) were threatened by agriculture alone. The cheetah, African wild dog and hairy-nosed otter are among the animals most affected by crop and livestock farming, timber plantations and aquaculture.

Chart, timeline

Description automatically generated

At the same time, the analysis showed, anthropogenic climate change – including increases in storms, flooding, extreme temperatures or extreme drought and sea-level rise – is currently affecting just 19% of species listed as threatened or near-threatened, and was ranked seventh among the 11 threats.

Hooded seals are among the 1,688 species affected. These have declined by 90% in the north-eastern Atlantic Arctic over the past few decades as a result of extensive declines in regional sea ice, and the availability of sites for resting and raising pups. The common hippopotamus and leatherback turtle are also being affected by climate-related droughts and high temperatures.

The analysis comes a month before representatives from government, industry and NGOs meet in Hawaii for the annual IUCN World Conservation Congress. High on the agenda will be defining a sustainable path for translating climate and development agreements – including the 2015 Paris agreement – into conservation actions.

But the authors say it is crucial that efforts to address climate change do not overshadow more immediate priorities for the survival of the world’s flora and fauna. Delegates must focus on proposing and funding actions that deal with the biggest threats to biodiversity, they urge.

“Addressing these old foes of over-harvesting and agricultural activities are key to turning around the biodiversity extinction crisis,” said lead author, Sean Maxwell of the University of Queensland, Australia. “This must be at the forefront of the conservation agenda.”

But the authors say there are solutions to alleviate the harm caused by overexploitation and agricultural activities, such as sustainable harvest regimes, hunting regulations and no-take marine protected areas, international forums such as Cites and public education to reduce demand.

Dr James Watson, co-author of the study from the WCS and the University of Queensland, said: “History has taught us that minimising impacts from over-harvesting and agriculture requires a variety of conservation actions but these can be achieved.

“Actions such as well-managed protected areas, enforcement of hunting regulations, and managing agricultural systems in ways that allow threatened species to persist within them, all have a major role to play in reducing the biodiversity crisis. These activities need to be well funded and prioritised in areas that will reduce threat.”

#### Technological advancements in agriculture solves – they increase biodiversity and prevent environmental damage

Capgemini 18 [(Capgemini is a French multinational corporation that provides consulting, technology, professional, and outsourcing services.) “Saving the planet with digital farming – our discussion with Tobias Menne (Global Head Digital Farming, BASF)” Capgemini, 5/25/2018] BC

Digital farming matters. Why? Because farmers are tasked with feeding a growing world population, expected to reach 10 billion by 2057 according to the UN, while dealing with the consequences of climate change. To achieve that, they need to embrace the digitization of agriculture.

I recently sat down with Tobias Menne, head of Global head Digital Farming at BASF to discuss this important topic within modern agronomics. In the final blog of this two-part series, we discuss the immense potential of digital farming. What can change and will it change?

The end of information asymmetry

In the previous blog, we defined digital farming as the gathering, combining, and sharing of relevant and scalable data to optimize and transform agronomics. The immense amounts of data offer insight, understanding, and quick learnings. This way it can help to battle global food and climate challenges.

Tobias elaborates: “What digital farming offers is insight into what is happening on the field. To understand whether or not a certain weed or disease is a threat to the crop. And all this information is available through smartphones, at a very low price point.”

Digital farming is particularly revolutionary for farmers in Africa and South East Asia where over 80% of farmers are small holders. Tobias: “These farmers not only gain a lot because they generally are further away from agronomic optimum compared to larger farms in the West. They mostly benefit because digital technology removes the information asymmetry that currently plagues them.”

Take the Himalayas, for instance. Because of limited biology training and a lack of qualified people in rural areas, farmers are often unaware of the types of weeds that grow on their fields. Thanks to digital farming, this is changing rapidly.

Farming with confidence

Digitalization transforms decision-making practices in agronomics. “In the past, farmers invested heavily in labor or crop protection to improve their agronomic situation,” Tobias explains. “They still need to do that. The difference, however, is that now they can be really sure that what they are doing is the right thing. So rather than increasing investments, they simply make smarter decisions. This is why digitization is so powerful.”

“Farmers will be able to embrace new technology much more confidently than in the past. And they can better deal with new weather phenomena and new situations. Because they profit from the learnings of other farmers around them.”

“Climate change makes farm life more daring and more challenging. That requires much better information on how to farm, what actions to take. Due to climate change we see weeds entering new territories. We already observe the migration of insects, for instance. Digitalization enables us to learn quicker, to combat those new developments.”

In other words: digital farming allows adaptable farming. Farmers can anticipate new situations better and faster. A true necessity in this time of climate change.

Save the planet

Because farmers can farm with more confidence, they are also able to grow a greater variety of crops. This will increase global biodiversity.

“Farming is often criticized for its perceived low level of biodiversity,” Tobias says. “You see a lot of corn and soy, and not a lot of variation within those crops. Industrial farming is so homogeneous because farmers wanted to reduce their complexity of decision making. If we start to trust systems for good agronomic decision making, adding crops and increasing functional biodiversity will no longer drive up the complexity of farms.”

This means that niche crops like cassava, quinoa, and buckwheat will become more widespread. And that, in turn, means we will find more diverse products in our local shops.

Digital farming can decrease the negative impact of farming tremendously. Next to improved biodiversity and water quality, the use of fewer crop protection products is beneficial for the environment. Tobias gives an example:

“I’m excited about smart sprayers. In the near future, these will go over the field and identify each weed with their camera. Their nozzles only open when they detect certain weeds. This will not only reduce the amount of product used per square meter, it also allows for species of rare weeds to be preserved.”

Trust me, I’m a farmer

As consumers we want to have food that is healthy for us, that has not impacted the environment in a negative way, that ideally was grown in our vicinity, and that is tasty. More importantly, we want to trust the information farmers, distributors, and retailers provide about our food. Through transparency, digitalization can increase or rebuild that trust.

“I would love to buy the fresh produce”, Tobias says, “knowing that I am contributing to a healthy community in the areas where it was grown. At the moment, I have little opportunity to do so. Sure, I can buy Fair Trade coffee or bananas, but for other products this is really challenging. I believe we can use digital farming to create more transparency on where food comes from and how it empowers the community that produce it.”

By reducing the impact farming has on the environment, digital farming can have a positive impact on consumers’ perception of food and food production, contribute to a healthy ecosystem, and offer insight into the food production chain.

#### Continued biodiversity loss causes extinction

Corbett 20 [(Jessica, a staff writer for Common Dreams) Internally cites IPBES (the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, an intergovernmental organization established to improve the interface between science and policy on issues of biodiversity and ecosystem services.) “World Leaders Urged to 'Act Now' to Save Biodiversity” EcoWatch, 2/19/2020] BC

Ahead of government negotiations scheduled for next week on a global plan to address the biodiversity crisis, 23 former foreign ministers from various countries released a statement on Tuesday urging world leaders to act "boldly" to protect nature.

"It is clear to us... that climate change, ecosystem degradation, and the excessive exploitation of natural resources are now threatening millions of species with extinction and jeopardizing the health of our planet," says the statement. "The loss and degradation of nature jeopardizes human health, livelihoods, safety, and prosperity. It disproportionately harms our poorest communities while undermining our ability to meet a broad range of targets set by the United Nations Sustainable Development Goals."

"The world has a moral imperative to collaborate on strong actions to mitigate and adapt to the current climate change and biodiversity crisis. Ambitious targets for conservation of land and ocean ecosystems are vital components of the solution," the statement continues. "Humanity sits on the precipice of irreversible loss of biodiversity and a climate crisis that imperils the future for our grandchildren and generations to come. The world must act boldly, and it must act now."

A U.N. report released in May 2019 by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) warned that, as Common Dreams reported at the time, "human exploitation of the natural world has pushed a million plant and animal species to the brink of extinction—with potentially devastating implications for the future of civilization."

That report and a growing body of scientific research on rapidly declining biodiversity has led scientists and policymakers alike to raise the alarm about the consequences of not acting ambitiously enough to address what experts have called the "sixth mass extinction." U.N. biodiversity chief Elizabeth Maruma Mrema told the Guardian last month that humanity risks being left to contend with an "empty world."

The new statement from diplomats came before the Feb. 24–29 meeting of the Working Group on the Post-2020 Global Biodiversity Framework, which was recently moved from Kunming, China to Rome, Italy due to the ongoing coronavirus disease (COVID-19) outbreak. The event will build on an August 2019 meeting in Nairobi, Kenya. A third meeting in Cali, Colombia is planned for July.

### 1NC – DA – ASATs

#### China’s capitalizing on US vulnerabilities and ramping up ASAT development now – that emboldens Xi to invade Taiwan

Chow and Kelley 8/21 [(Brian G., policy analyst for the Institute of World Politics, Ph.D in physics from Case Western Reserve University, MBA and Ph.D in finance from the University of Michigan,and Brandon, graduate of Georgetown’s School of Foreign Service ) “China’s Anti-Satellite Weapons Could Conquer Taiwan—Or Start a War,” National Interest, 8/21/2021] JL

If current trends hold, then China’s Strategic Support Force will be capable by the late 2020s of holding key U.S. space assets at risk. Chinese military doctrine, statements by senior officials, and past behavior all suggest that China may well believe threatening such assets to be an effective means of deterring U.S. intervention. If so, then the United States would face a type of “Sophie’s Choice”: decline to intervene, potentially leading allies to follow suit and Taiwan to succumb without a fight, thereby enabling Xi to achieve his goal of “peacefully” snuffing out Taiwanese independence; or start a war that would at best be long and bloody and might well even cross the nuclear threshold.

This emerging crisis has been three decades in the making. In 1991, China watched from afar as the United States used space-enabled capabilities to obliterate the Iraqi military from a distance in the first Gulf War. The People’s Liberation Army quickly set to work developing capabilities targeted at a perceived Achilles’ heel of this new American way of war: reliance on vulnerable space systems.

This project came to fruition with a direct ascent ASAT weapons test in 2007, but the test was limited in two key respects. First, it only reached low Earth orbit. Second, it generated thousands of pieces of long-lasting space junk, provoking immense international ire. This backlash appears to have taken China by surprise, driving it to seek new, more usable ASAT types with minimal debris production. Now, one such ASAT is nearing operational status: spacecraft capable of rendezvous and proximity operations (RPOs).

Such spacecraft are inevitable and cannot realistically be limited. The United States, European Union, China, and others are developing them to provide a range of satellite services essential to the new space economy, such as in situ repairs and refueling of satellites and active removal of space debris. But RPO capabilities are dual-use: if a satellite can grapple space objects for servicing, then it might well be capable of grappling an adversary’s satellite to move it out of its servicing orbit. Perhaps it could degrade or disable it by bending or disconnecting its solar panels and antennas all while producing minimal debris.

This is a serious threat, primarily because no international rules presently exist to limit close approaches in space. Left unaddressed, this lacuna in international law and space policy could enable a prospective attacker to pre-position, during peacetime, as many spacecraft as they wish as close as they wish to as many high-value targets as they wish. The result would be an ever-present possibility of sudden, bolt-from-the-blue attacks on vital space assets—and worse, on many of them at once.

China has conducted at least half a dozen tests of RPO capabilities in space since 2008, two of which went on for years. Influential space experts have noted that these tests have plausible peaceful purposes and are in many cases similar to those conducted by the United States. This, however, does not make it any less important to establish effective legal, policy, and technical counters to their offensive use. Even if it were certain that these capabilities are intended purely for peaceful applications—and it is not at all clear that that is the case—China (or any other country) could at any time decide to repurpose these capabilities for ASAT use.

There is still time to get out ahead of this threat, but likely not for much longer. China’s RPO capabilities have, thus far, lagged about five years behind those of the United States. There are reasons to believe this gap may close, but even assuming that it holds, we should expect to see China demonstrate an operational dual-use rendezvous spacecraft by around 2025. (The first instance of a U.S. commercial satellite docking with another satellite to change its orbit occurred in February 2020.)

At the same time, China is expanding its capacity for rapid spacecraft manufacturing. The Global Times reported in January that China’s first intelligent mass production line is set to produce 240 small satellites per year. In April, Andrew Jones at SpaceNews reported that China is developing plans to quickly produce and loft a thirteen thousand-satellite national internet megaconstellation. It is not unreasonable to assume that China could manufacture two hundred small rendezvous ASAT spacecraft by 2029, possibly more.

If this happens, and Beijing was to decide in 2029 to launch these two hundred small RPO spacecraft and position them in close proximity to strategically vital assets, then China would be able to simultaneously threaten disablement of the entire constellations of U.S. satellites for missile early warning (about a dozen satellites with spares included); communications in a nuclear-disrupted environment (about a dozen); and positioning, navigation, and timing (about three dozen); along with several dozen key communications, imagery, and meteorology satellites. Losing these assets would severely degrade U.S. deterrence and warfighting capabilities, yet once close pre-positioning has occurred such losses become almost impossible to prevent. For this reason, such pre-positioning could conceivably deter the United States from coming to Taiwan’s aid due to the prospect that intervention would spur China to disable these critical space systems. Without their support, the war would be much bloodier and costlier—a daunting proposition for any president.

Should the United States fail to intervene, the consequences would be disastrous for both Washington and its allies in East Asia, and potentially the credibility of U.S. defense commitments around the globe. Worse yet, however, might be what could happen if China believes that such a threat will succeed but proves to be wrong. History is rife with examples of major wars arising from miscalculations such as this, and there are many pathways by which such a situation could easily escalate out of control to a full-scale conventional conflict or even to nuclear use.

#### Starlink development solves – mega-constellations are unjammable and accurate

Harris 20 [(Mark, Knight Science Journalism Fellow at MIT in 2013, writes about technology, science, business, the environment, and travel, internally cites Todd Humphreys, Professor of Aerospace Engineering at UT Austin, and Peter Iannucci,, Postdoctoral Research Fellow in Aerospace Engineering and Engineering Mechanics at UT Austin) “SpaceX’s Starlink satellites could make US Army navigation hard to jam,” MIT Technology Review, 9/28/2020] JL

Now, research funded by the US Army has concluded that the growing mega-constellation could have a secondary purpose: doubling as a low-cost, highly accurate, and almost unjammable alternative to GPS. The new method would use existing Starlink satellites in low Earth orbit (LEO) to provide near-global navigation services.

In a non-peer-reviewed paper, Todd Humphreys and Peter Iannucci of the Radionavigation Laboratory at the University of Texas at Austin claim to have devised a system that uses the same satellites, piggybacking on traditional GPS signals, to deliver location precision up to 10 times as good as GPS, in a system much less prone to interference.

The Global Positioning System consists of a constellation of around 30 satellites orbiting 20,000 kilometers above Earth. Each satellite continuously broadcasts a radio signal containing its position and the exact time from a very precise atomic clock on board. Receivers on the ground can then compare how long signals from multiple satellites take to arrive and calculate their position, typically to within a few meters.

The problem with GPS is that those signals are extremely weak by the time they reach Earth, and are easily overwhelmed by either accidental interference or electronic warfare. In China, mysterious GPS attacks have successfully “spoofed” ships in fake locations, while GPS signals are regularly jammed in the eastern Mediterranean.

The US military relies heavily on GPS. Last year, the US Army Futures Command, a new unit dedicated to modernizing its forces, visited Humphreys’s lab to talk about a startup called Coherent Navigation he had cofounded in 2008. Coherent, which aimed to use signals from Iridium satellites as a rough alternative to GPS, was acquired by Apple in 2015.

“They told me the Army has a relationship with SpaceX [it signed an agreement to test Starlink to move data across military networks in May] and would I be interested in talking to SpaceX about using their Starlink satellites the same way that I used these old Iridium satellites?” Humphreys says. “That got us an audience with people at SpaceX, who liked it, and the Army gave us a year to look into the problem.” Futures Command also provided several million dollars in funding.

The concept of using LEO satellites for navigation isn't new. In fact, some of the first US spacecraft launched in the 1960s were Transit satellites orbiting at 1,100 kilometers, providing location information for Navy ships and submarines. The advantage of an LEO constellation is that the signals can be a thousand times stronger than GPS. The disadvantage is that each satellite can serve only a small area beneath it, so that reliable global coverage requires hundreds or even thousands of satellites.

Building a whole new network of LEO satellites with ultra-accurate clocks would be an expensive undertaking. Bay Area startup Xona Space Systems plans to do just that, aiming to launch a constellation of at least 300 Pulsar satellites over the next six years.

Humphreys and Iannucci’s idea is different: they would use a simple software upgrade to modify Starlink’s satellites so their communications abilities and existing GPS signals could provide position and navigation services .

They claim their new system can even, counterintuitively, deliver better accuracy for most users than the GPS technology it relies upon. That is because the GPS receiver on each Starlink satellite uses algorithms that are rarely found in consumer products, to pinpoint its location within just a few centimeters. These technologies exploit physical properties of the GPS radio signal, and its encoding, to improve the accuracy of location calculations. Essentially, the Starlink satellites can do the heavy computational lifting for their users below.

The Starlink satellites are also essentially internet routers in space, capable of achieving 100 megabits per second. GPS satellites, on the other hand, communicate at fewer than 100 bits per second.

“There are so few bits per second available for GPS transmissions that they can’t afford to include fresh, highly accurate data about where the satellites actually are,” says Iannucci. “If you have a million times more opportunity to send information down from your satellite, the data can be much closer to the truth.”

The new system, which Humphreys calls fused LEO navigation, will use instant orbit and clock calculations to locate users to within 70 centimeters, he estimates. Most GPS systems in smartphones, watches, and cars, for comparison, are only accurate to a few meters.

But the key advantage for the Pentagon is that fused LEO navigation should be significantly more difficult to jam or spoof. Not only are its signals much stronger at ground level, but the antennas for its microwave frequencies are about 10 times more directional than GPS antennas. That means it should be easier to pick up the true satellite signals rather than those from a jammer.  “At least that’s the hope,” says Humphreys.

According to Humphreys and Iannucci’s calculations, their fused LEO navigation system could provide continuous navigation service to 99.8% of the world’s population, using less than 1% of Starlink’s downlink capacity and less than 0.5% of its energy capacity.

“I do think this could lead to a more robust and accurate solution than GPS alone,” says Todd Walter of Stanford University’s GPS Lab, who was not involved with the research. “And if you don’t have to modify Starlink’s satellites, it certainly is a fast, simple way to go.”

#### Taiwan goes nuclear – the US gets drawn in

The Week 1/4 [(The Week Staff, weekly news magazine with editions in the United Kingdom and United States) “What would happen if China tried to invade Taiwan?” The Week Staff, 1/4/2022] JL

If a conflict were to break out between the two neighbours it would be “a catastrophe”, reported The Economist. This is first because of “the bloodshed in Taiwan” but also because of the risk of “escalation between two nuclear powers”, namely the US and China.

Beijing massively outguns Taiwan, with estimates from the Stockholm International Peace Research Institute showing that China spends about 25 times more on its military. However, Taiwan has a defence pact with the US dating back to the 1954 Sino-American Mutual Defence Treaty, meaning the US could, in theory, be drawn into the conflict.

“Beijing’s optimistic version of events” after the decision to invade would see “cyber and electronic warfare units target Taiwan’s financial system and key infrastructure, as well as US satellites to reduce notice of impending ballistic missiles”, Bloomberg said.

“Chinese vessels could also harass ships around Taiwan, restricting vital supplies of fuel and food,” the news site continued, while “airstrikes would quickly aim to kill Taiwan’s top political and military leaders, while also immobilising local defences”.

This would be followed by “warships and submarines traversing some 130 kilometres [80 miles] across the Taiwan Strait”, before “thousands of paratroopers would appear above Taiwan’s coastlines, looking to penetrate defences [and] capture strategic buildings”.

According to satellite imagery seen by military news site The Drive, China has also begun “beefing up its combat aviation infrastructure across from Taiwan as invasion fears grow”.

Beijing “is upgrading three air bases located opposite” the island, “boosting its air power capability in an already tense region that is flush with air combat capabilities.”

“Construction of the new infrastructure began in early 2020 and continued uninterrupted through the pandemic, underlining its priority,” the site added.

Taiwan would be reliant on “natural defences” – its rugged coastline and rough sea – with plans to “throw a thousand tanks at the beachhead” in the event of a Chinese invasion that could result in “brutal tank battles” that “decide the outcome”, according to Forbes.

The island’s top military leadership has also “warned China that the closer its aircraft and ships get to the island the harder Taipei will respond”, Bloomberg reported, with “a multi-pronged approach that utilises aircraft, ships and its air defence systems to counter Chinese military incursions” in the works.

“Chinese state media has dismissed the idea of Taiwan retaliating,” the news agency added. But a report by the island’s defence ministry sent to legislators shows the island is preparing to “take tougher measures” should they be necessary.

This would all be complicated by the US pledge to defend its ally in what The Economist called a “test of America’s military might and its diplomatic and political resolve”.

Asked last week during a CNN town hall meeting whether the US would mount a military response if Beijing attempted to take the island by force, Biden responded: “Yes, we have a commitment to do that.”

The Guardian said that Biden “made a similar pledge in August”, when he told ABC News that the US has a “sacred commitment” to defend its Nato allies in Canada and Europe and it was the “same with Japan, same with South Korea, same with Taiwan”.

If the US had decided against intervention, “China would overnight become the dominant power in Asia” and “America’s allies around the world would know that they could not count on it”, the paper added. In other words, “Pax Americana would collapse”.

That would be unacceptable in Washington, especially as “Joe Biden pivots US foreign policy towards a focus on the Indo-Pacific as the main arena for 21st-century superpower competition”, The Guardian said.

Biden’s comments during the CNN event were “at odds with the long-held US policy” of “strategic ambiguity”, The Telegraph said. Historically, Washington has helped “build Taiwan’s defences” but has “not explicitly promised to come to the island’s aid”.

US manoeuvres have so far consisted of building up “large amounts of lethal military hardware”, The Guardian added, with “the steady buildup of troops and equipment and the proliferation of war games” meaning there is “more of a chance of conflict triggered by miscalculation or accident”.

The primary danger that comes with US involvement lies in the fact that both Washington and Beijing possess nuclear weapons.

Leaked documents published by The New York Times earlier this year revealed the extent of Washington’s discussions about using nuclear weapons to deter a Chinese invasion of Taiwan in the 1950s.

Provided to the paper by Daniel Ellsberg, the whistleblower behind the 1971 Pentagon Papers, the documents appeared to show an “acceptance by some US military leaders of possible retaliatory nuclear strikes on US bases”, CNN noted, raising the spectre of how the nuclear powers would square off in a 21st-century conflict.

## Case

### 1NC – collisions

1. **Kessler syndrome –** 
   1. **Probability – 0.1% chance of a collision.**

**Salter 16** [(Alexander William, Economics Professor at Texas Tech) “SPACE DEBRIS: A LAW AND ECONOMICS ANALYSIS OF THE ORBITAL COMMONS” 19 STAN. TECH. L. REV. 221 \*numbers replaced with English words] TDI

The probability of a collision is currently low. Bradley and Wein estimate that the maximum probability in LEO of a collision over the lifetime of a spacecraft remains below one in one thousand, conditional on continued compliance with NASA’s deorbiting guidelines.3 However, the possibility of a future “snowballing” effect, whereby debris collides with other objects, further congesting orbit space, remains a significant concern.4 Levin and Carroll estimate the average immediate destruction of wealth created by a collision to be approximately $30 million, with an additional $200 million in damages to all currently existing space assets from the debris created by the initial collision.5 The expected value of destroyed wealth because of collisions, currently small because of the low probability of a collision, can quickly become significant if future collisions result in runaway debris growth.

* 1. **Time frame – Kessler effect 200 years away**

**Stubbe 17** [(Peter, PhD in law @ Johann Wolfgang Goethe University Frankfurt) “State Accountability for Space Debris: A Legal Study of Responsibility for Polluting the Space Environment and Liability for Damage Caused by Space Debris,” Koninklijke Brill Publishing, ISBN 978-90-04-31407-8, p. 27-31] TDI

The prediction of possible scenarios of the future evolution of the debris p o p ulation involves many uncertainties. Long-term forecasting means the prediction of the evolution of the future debris environment in time periods of decades or even centuries. Predictions are based on models84 that work with certain assumptions, and altering these parameters significantly influences the outcomes of the predictions. Assumptions on the future space traffic and on the initial object environment are particularly critical to the results of modeling efforts.85 A well-known pattern for the evolution of the debris population is the so-called Kessler effect’, which assumes that there is a certain collision probability among space objects because many satellites operate in similar orbital regions. These collisions create fragments, and thus additional objects in the respective orbits, which in turn enhances the risk of further collisions. Consequently, the num ber of objects and collisions increases exponentially and eventually results in the formation of a self-sustaining debris belt aroundthe Earth. While it has long been assumed that such a process of collisional cascading is likely to occur only in a very long-term perspective (meaning a time 1 n of several hundred years),87 a consensus has evolved in recent years that an uncontrolled growth of the debris population in certain altitudes could become reality much sooner.88 In fact, a recent cooperative study undertaken by various space agencies in the scope of i a d c shows that the current l e o debris population is unstable, even if current mitigation measures are applied. The study concludes:

Even with a 90% implementation of the commonly-adopted mitigation measures [...] the l e o debris population is expected to increase by an average of 30% in the next 200 years. The population growth is primarily driven by catastrophic collisions between 700 and 1000 km altitudes and such collisions are likely to occur every 5 to 9 years.89

#### Public sector mining thumps

NASA 19 [“NASA Invests in Tech Concepts Aimed at Exploring Lunar Craters, Mining Asteroids,” NASA, June 11, 2019, <https://www.nasa.gov/press-release/nasa-invests-in-tech-concepts-aimed-at-exploring-lunar-craters-mining-asteroids>] TDI

NASA Invests in Tech Concepts Aimed at Exploring Lunar Craters, Mining Asteroids

Robotically surveying lunar craters in record time and mining resources in space could help NASA establish a sustained human presence at the Moon – part of the agency’s broader [Moon to Mars exploration](https://www.nasa.gov/specials/moon2mars/) approach. Two mission concepts to explore these capabilities have been selected as the first-ever Phase III studies within the [NASA Innovative Advanced Concepts](https://www.nasa.gov/niac) (NIAC) program.

“We are pursuing new technologies across our development portfolio that could help make deep space exploration more Earth-independent by utilizing resources on the Moon and beyond,” said Jim Reuter, associate administrator of NASA’s Space Technology Mission Directorate. “These NIAC Phase III selections are a component of that forward-looking research and we hope new insights will help us achieve more firsts in space.”

The Phase III proposals outline an aerospace architecture, including a mission concept, that is innovative and could change what’s possible in space. Each selection will receive as much as $2 million. Over the course of two years, researchers will refine the concept design and explore aspects of implementing the new technology. The inaugural Phase III selections are:

Robotic Technologies Enabling the Exploration of Lunar Pits

William Whittaker, Carnegie Mellon University, Pittsburgh

This mission concept, called Skylight, proposes technologies to rapidly survey and model lunar craters. This mission would use high-resolution images to create 3D model of craters. The data would be used to determine whether a crater can be explored by human or robotic missions. The information could also be used to characterize ice on the Moon, a crucial capability for the sustained surface operations of NASA’s Artemis program. On Earth, the technology could be used to autonomously monitor mines and quarries.

[Mini Bee Prototype to Demonstrate the Apis Mission Architecture and Optical Mining Technology](https://www.nasa.gov/directorates/spacetech/niac/2019_Phase_I_Phase_II/Mini_Bee_Prototype)

Joel Sercel, TransAstra Corporation, Lake View Terrace, California

This flight demonstration mission concept proposes a method of asteroid resource harvesting called optical mining. Optical mining is an approach for excavating an asteroid and extracting water and other volatiles into an inflatable bag. Called Mini Bee, the mission concept aims to prove optical mining, in conjunction with other innovative spacecraft systems, can be used to obtain propellant in space. The proposed architecture includes resource prospecting, extraction and delivery.

#### No impact scenario – vaguely talks about countries like North Korea, South Korea, Japan and china but has 0 escalation scenario – who uses first, what weapons, who responds, draw in, etc. – also def doesn’t rise to the level of the nuclear war assumed by Edwards

#### No impact to hacking – this evidence lists past examples from 2008 and 2018 that didn’t escalate and states like Iran have tried and failed which prove it is difficult and unlikely – also massively increases the severity of the hacking they need to win happens

#### **Zero risk of cyberterror – no tech capability and no publicity motive – it’s media hype.**

Conway 11 [Maura Conway (Lecturer in International Security in the School of Law and Government at Dublin City University, PhD in Political Science), “Against Cyberterrorism”, Communications of the Association for Computing Machinery, Vol. 54 No. 2, February 2011]

Cyberterrorism is a concept that appears recurrently in contemporary media. It is not just reported upon in newspapers and on television, but is also the subject of movies (such as 1990’s Die Hard II and 2007’s Die Hard IV: Live Free or Die Hard) and popular fiction books (for example, Winn Schwartau’s 2002 novel Pearl Harbor Dot Com). This coverage is particularly interesting if one believes, as I do, that no act of cyberterrorism has ever yet occurred and is unlikely to at any time in the near future. Having said that, it is almost always portrayed in the press as either having already occurred or being just around the corner. As an academic, I’m not alone in arguing that no act of cyberterrorism has yet occurred and, indeed, some journalists agree; most, however, seem convinced as to the salience of this threat. Why? I can only surmise that, just as a large amount of social psychological research has shown, the uncertain and the unknown generally produce fear and anxiety. This is the psychological basis of an effective movie thriller: the fear is greatest when you suspect something, but you’re not certain what it is. The term “cyberterrorism” unites two significant modern fears: fear of technology and fear of terrorism. Fear of terrorism, though the likelihood of any one of us being the victim of terrorism is statistically insignificant, has become perhaps normalized; but fear of technology? In fact, for those unfamiliar with the workings of complex technologies, these are perceived as arcane, unknowable, abstract, and yet increasingly powerful and ubiquitous. Many people therefore fear that technology will become the master and humankind the servant. Couple this relatively new anxiety with age-old fears associated with apparently random violence and the result is a truly heightened state of alarm. Many journalists—although fewer technology journalists than others— have succumbed, like members of the general population, to these fears, to which the journalists have then added further fuel with their reporting. The Definition Issue The second stumbling block for journalists is that just as the definition of terrorism is fraught, so too is the definition of cyberterrorism. My preference is to distinguish between cyberterrorism and terrorist use of the Net. This is the distinction FBI Director Robert Mueller seemed implicitly to be drawing in a March 2010 speech in which he stated that “the Internet is not only used to plan and execute attacks; it is a target in and of itself…We in the FBI, with our partners in the intelligence community, believe the cyber terrorism threat is real, and it is rapidly expanding.” Where the FBI Director and I diverge is in the efficacy of the cyberterrorist threat as opposed to that of everyday terrorist use of the Net (that is, for radicalization, researching and planning, financing, and other purposes). Dorothy Denning’s definitions of cyberterrorism are probably the most well known and respected. Her most recent attempt at defining cyberterrorism is: “…[H]ighly damaging computer-based attacks or threats of attack by non-state actors against information systems when conducted to intimidate or coerce governments or societies in pursuit of goals that are political or social. It is the convergence of terrorism with cyberspace, where cyberspace becomes the means of conducting the terrorist act. Rather than committing acts of violence against persons or physical property, the cyberterrorist commits acts of destruction or disruption against digital property.”(2) Analyses of cyberterrorism can be divided into two broad categories on the basis of where the producers stand on the definition issue: those who agree broadly with Denning versus those who wish to incorporate not just use, but a host of other activities into the definition. The literature can also be divided on the basis of where the authors stand on the magnitude of the cyberterrorism threat. Dunn-Cavelty uses the term “Hypers” to describe those who believe a cyberterrorist attack is not just likely, but imminent, and the term “De-Hypers” to describe those who believe such an attack is unlikely.(1) Most journalists are hypers, on the other hand I’m emphatically a de-hyper. In this column, I lay out the three major reasons why. Three Arguments Against Cyberterrorism In my opinion, the three most compelling arguments against cyberterrorism are: • The argument of Technological Complexity; • The argument regarding 9/11 and the Image Factor; and • The argument regarding 9/11 and the Accident Issue. The first argument is treated in the academic literature; the second and third arguments are not, but ought to be. None of these are angles to which journalists appear to have devoted a lot of thought or given adequate consideration. In the speech mentioned earlier, FBI Director Mueller observed “Terrorists have shown a clear interest in pursuing hacking skills. And they will either train their own recruits or hire outsiders, with an eye toward combining physical attacks with cyber attacks.” That may very well be true, but the argument from Technological Complexity underlines that ‘wanting’ to do something is quite different from having the ability to do the same. Here’s why: Violent jihadis’ IT knowledge is not superior. For example, in research carried out in 2007, it was found that of a random sampling of 404 members of violent Islamist groups, 196 (48.5%) had a higher education, with information about subject areas available for 178 individuals. Of these 178, some 8 (4.5%) had trained in computing, which means that out of the entire sample, less than 2% of the jihadis came from a computing background.(3) And not even these few could be assumed to have mastery of the complex systems necessary to carry out a successful cyberterrorist attack

. Real-world attacks are difficult enough. What are often viewed as relatively unsophisticated real-world attacks undertaken by highly educated individuals are routinely unsuccessful. One only has to consider the failed car bomb attacks planned and carried out by medical doctors in central London and at Glasgow airport in June 2007. Hiring hackers would compromise operational security. The only remaining option is to retain “outsiders” to undertake such an attack. This is very operationally risky. It would force the terrorists to operate outside their own circles and thus leave them ripe for infiltration. Even if they successfully got in contact with “real” hackers, they would be in no position to gauge their competency accurately; they would simply have to trust in same. This would be very risky. So on the basis of technical knowhow alone cyberterror attack is not imminent, but this is not the only factor one must take into account. The events of Sept. 11, 2001 underscore that for a true terrorist event spectacular moving images are crucial. The attacks on the World Trade Center were a fantastic piece of performance violence; look back on any recent roundup of the decade and mention of 9/11 will not just be prominent, but pictures will always be provided. The problem with respect to cyberterrorism is that many of the attack scenarios put forward, from shutting down the electric power grid to contaminating a major water supply, fail on this account: they are unlikely to have easily captured, spectacular (live, moving) images associated with them, something we—as an audience—have been primed for by the attack on the World Trade Center on 9/11. The only cyberterrorism scenario that would fall into this category is interfering with air traffic control systems to crash planes, but haven’t we seen that planes can much more easily be employed in spectacular “real-world” terrorism? And besides, aren’t all the infrastructures just mentioned much easier and more spectacular to simply blow up? It doesn’t end there, however. For me, the third argument against cyberterrorism is perhaps the most compelling; yet it is very rarely mentioned. In 2004, Howard Schmidt, former White House Cybersecurity Coordinator, remarked to the U.S. Senate Committee on the Judiciary regarding Nimda and Code Red that “we to this day don’t know the source of that. It could have very easily been a terrorist.”(4) This observation betrays a fundamental misunderstanding of the nature and purposes of terrorism, particularly its attention-getting and communicative functions. A terrorist attack with the potential to be hidden, portrayed as an accident, or otherwise remain unknown is unlikely to be viewed positively by any terrorist group. In fact, one of the most important aspects of the 9/11 attacks in New York from the perpetrators viewpoint was surely the fact that while the first plane to crash into the World Trade Center could have been accidental, the appearance of the second plane confirmed the incident as a terrorist attack in real time. Moreover, the crash of the first plane ensured a large audience for the second plane as it hit the second tower. Alternatively, think about the massive electric failure that took place in the northeastern U.S. in August 2003: if it was a terrorist attack—and I’m not suggesting that it was—but if it was, it would have been a spectacular failure. Conclusion Given the high cost—not just in terms of money, but also time, commitment, and effort—and the high possibility of failure on the basis of manpower issues, timing, and complexity of a potential cyberterrorist attack, the costs appear to me to still very largely outweigh the potential publicity benefits. The publicity aspect is crucial for potential perpetrators of terrorism and so the possibility that an attack may be apprehended or portrayed as an accident, which would be highly likely with regard to cyberterrorism, is detrimental. Add the lack of spectacular moving images and it is my belief that cyberterrorism, regardless of what you may read in newspapers, see on television, or obtain via other media sources, is not in our near future. So why then the persistent treatment of cyberterrorism on the part of journalists? Well, in this instance, science fiction-type fears appear to trump rational calculation almost every time. And I haven’t even begun to discuss how the media discourse has clearly influenced the pronouncements of policymakers.

### 1NC – Space Militarization

#### I’ll concede ASATs cause US-Russia miscalc – that’s good

#### The US would first strike Russia – they could eliminate their nuclear arsenal with a conventional strike

Plesch 18 [(Dan, Director of the Centre for International Studies and Diplomacy, SOAS, University of London) “Could the US win World War III without using nuclear weapons?” The Conversation, 4/19/2018] BC

As the US, Russia and China test each other’s patience and strategic focus, speculation about the chances of a world war has hit a new high. But many of the people seriously engaged in this weighty discussion often get it wrong.

When it comes to estimating military capability, the Western media is principally concerned with the weapons capabilities of weaker states – and it rarely pays much attention to the colossal capability of the US, which still accounts for most of the world’s defence spending.

Any sensible discussion of what a hypothetical World War III might look like needs to begin with the sheer size and force of America’s military assets. For all that China and Russia are arming up on various measures, US commanders have the power to dominate escalating crises and counter opposing forces before they can be used.

Take missile warfare alone. The US Navy already has 4,000 Tomahawk cruise missiles, and the Navy and Air Force are currently taking delivery of 5,000 JASSM conventional cruise missiles with ranges from 200-600 miles. Barely visible to radar, these are designed to destroy “hardened” targets such as nuclear missile silos. Russia and China, by contrast, have nothing of equivalent quantity or quality with which to threaten the US mainland.

The same holds true when it comes to maritime forces. While much is made of Russia’s two frigates and smaller vessels stationed off the Syrian coast, France alone has 20 warships and an aircraft carrier in the Mediterranean – and US standing forces in the area include six destroyers equipped with scores of cruise missiles and anti-missile systems. At the other end of Europe, the Russian military is threatening the small Baltic states, but it is rarely noted that the Russian Baltic fleet is the same size as Denmark’s and half the size of Germany’s.

Meanwhile, China’s aggressively expansionist behaviour in the South China Sea is reported alongside stories of its first aircraft carrier and long-range ballistic missiles. But for all that the Chinese navy is large and growing, according to the International Institute for Strategic Studies, it’s still only numerically equivalent to the combined fleets of Japan and Taiwan, while the US boasts 19 aircraft carriers worldwide if its marine assault ships are included.

But overhanging all this, of course, is the nuclear factor.

Out of the sky

The US, Russia and China are all nuclear-armed; Vladimir Putin recently unveiled a new fleet of nuclear-capable missiles which he described as “invincible in the face of all existing and future systems”, and some have suggested that China may be moving away from its no-first-use policy. This is all undeniably disturbing. While it has long been assumed that the threat of nuclear weapons acts as a deterrent to any war between the major powers, it’s also possible that the world may simply have been riding its luck. But once again, the US’s non-nuclear capabilities are all too often overlooked.

US leaders may in fact believe they can remove Russia’s nuclear deterrent with an overwhelming conventional attack backed up by missile defences. This ability was cultivated under the Prompt Global Strike programme, which was initiated before 9/11 and continued during the Obama years. Organised through the US Air Force’s Global Strike Command, it is to use conventional weapons to attack anywhere on Earth in under 60 minutes.

This is not to say the task would be small. In order to destroy Russia’s nuclear missiles before they can be launched, the US military would need to first blind Russian radar and command and communications to incoming attack, probably using both physical and cyber attacks. It would then have to destroy some 200 fixed and 200 mobile missiles on land, a dozen Russian missile submarines, and Russian bombers. It would then need to shoot down any missiles that could still be fired.

Russia is not well positioned to survive such an attack.

Its early warning radars, both satellite and land-based, are decaying and will be hard to replace. At the same time, the US has and is developing a range of technologies to carry out anti-satellite and radar missions, and it has been using them for years. (All the way back in 1985, it shot down a satellite with an F15 jet fighter.) That said, the West is very dependent on satellites too, and Russia and China continue to develop their own anti-satellite systems.

The air war

Russia’s bomber aircraft date back to the Soviet era, so despite the alarm they provoke when they nudge at Western countries’ airspace, they pose no major threat in themselves. Were the Russian and US planes to face each other, the Russians would find themselves under attack from planes they couldn’t see and that are any way out of their range.

US and British submarine crews claim a perfect record in constantly shadowing Soviet submarines as they left their bases throughout the Cold War. Since then, Russian forces have declined and US anti-submarine warfare has been revived, raising the prospect that Russian submarines could be taken out before they could even launch their missiles.

The core of the Russia’s nuclear forces consists of land-based missiles, some fixed in silos, others mobile on rail and road. The silo-based missiles can now be targeted by several types of missiles, carried by US planes almost invisible to radar; all are designed to destroy targets protected by deep concrete and steel bunkers. But a problem for US war planners is that it might take hours too long for their missile-carrying planes to reach these targets – hence the need to act in minutes.

One apparently simple solution to attacking targets very quickly is to fit quick nuclear ballistic missiles with non-nuclear warheads. In 2010, Robert Gates, then serving as secretary of defence under Barack Obama, said that the US had this capability. Intercontinental ballistic missiles take just 30 minutes to fly between the continental US’s Midwest and Siberia; if launched from well-positioned submarines, the Navy’s Tridents can be even quicker, with a launch-to-target time of under ten minutes.

From 2001, the US Navy prepared to fit its Trident missiles with either inert solid warheads – accurate to within ten metres – or vast splinter/shrapnel weapons. Critics have argued that this would leave a potential enemy unable to tell whether they were under nuclear or conventional attack, meaning they would have to assume the worst. According to US Congressional researchers, the development work came close to completion, but apparently ceased in 2013.

Nonetheless, the US has continued to develop other technologies across its armed services to attack targets around the world in under an hour – foremost among them hypersonic missiles, which could return to Earth at up to ten times the speed of sound, with China and Russia trying to keep up.

Missile envy

The remainder of Russia’s nuclear force consists of missiles transported by rail. An article on Kremlin-sponsored news outlet Sputnik described how these missile rail cars would be so hard to find that Prompt Global Strike might not be as effective as the US would like – but taken at face value, the article implies that the rest of the Russian nuclear arsenal is in fact relatively vulnerable.

Starting with the “Scud hunt” of the First Gulf War, the US military has spent years improving its proficiency at targeting mobile ground-based missiles. Those skills now use remote sensors to attack small ground targets at short notice in the myriad counter-insurgency operations it’s pursued since 2001.

If the “sword” of Prompt Global Strike doesn’t stop the launch of all Russian missiles, then the US could use the “shield” of its own missile defences. These it deployed after it walked out of a treaty with Russia banning such weapons in 2002.

While some of these post-2002 missile defence systems have been called ineffective, the US Navy has a more effective system called Aegis, which one former head of the Pentagon’s missile defence programs claims can shoot down intercontinental ballistic missiles. Some 300 Aegis anti-ballistic missiles now equip 40 US warships; in 2008, one destroyed a satellite as it fell out of orbit.

War mentality

In advance of the Iraq war, various governments and onlookers cautioned the US and UK about the potential for unforeseen consequences, but the two governments were driven by a mindset impervious to criticism and misgivings. And despite all the lessons that can be learned from the Iraq disaster, there’s an ample risk today that a similarly gung-ho attitude could take hold.

Foreign casualties generally have little impact on domestic US politics. The hundreds of thousands of Iraqi civilians who died under first sanctions and then war did not negatively impact presidents Clinton or George W. Bush. Neither might the prospect of similar casualties in Iran or North Korea or other states, especially if “humanitarian” precision weapons are used.

But more than that, an opinion poll run by Stanford University’s Scott Sagan found that the US public would not oppose the preemptive use of even nuclear weapons provided that the US itself was not affected. And nuclear Trident offers that temptation.

The control of major conventional weapons as well as WMD needs urgent attention from international civil society, media and political parties. There is still time to galvanise behind the Nobel-winning International Campaign to Abolish Nuclear Weapons and the nuclear ban treaty, and to revive and globalise the decaying arms control agenda of the Organisation for Security and Co-operation in Europe, which played a vital part in bringing the Cold War to a largely peaceful end.

Like the Kaiser in 1914, perhaps Trump or one of his successors will express dismay when faced with the reality a major US offensive unleashes. But unlike the Kaiser, who saw his empire first defeated and then dismembered, perhaps a 21st-century US president might get away with it.

**Successful preemptive strike forces a surrender – solves further escalation**

Sarah **Johnson 17**, "U.S. Nuclear First Strike Policy; Be Afraid", Bill Track 50, https://www.billtrack50.com/blog/in-the-news/u-s-nuclear-first-strike-policy-be-afraid/

The second situation is a [preemptive strike](http://www.dictionary.com/browse/preemptive-strike) — a first-strike attack with nuclear weapons carried out to destroy an enemy’s capacity to respond. Preemptive strikes can be based on the assumption that the enemy is planning an **imminent attack**, but don’t have to be. The methodology behind a preemptive nuclear strike is to attack the enemy’s **strategic nuclear weapon facilities** (missile silos, submarine bases, bomber airfields), command and control sites and storage depots first. By hitting these targets first the enemy will be **so wounded** with **so little of their resources left** that they will be **forced to surrender** with minimal damage to the attacking party.

**Otherwise, Russia will broadly scale up military AI – extinction**

Mike **Rogers 17**, former US Representative from Michigan, chairman of the House Permanent Select Committee on Intelligence, "Artificial intelligence — the arms race we may not be able to control", TheHill, https://thehill.com/opinion/technology/351725-artificial-intelligence-is-the-new-arms-race-we-may-not-be-able-to-control

“Whoever becomes the leader in this sphere will **become ruler of the world**,” [said](https://www.theverge.com/2017/9/4/16251226/russia-ai-putin-rule-the-world) Vladimir Putin. The sphere the President of Russia is referring to is **artificial intelligence** (AI) and his comments should give you a moment of pause. Addressing students at the beginning of our Labor Day weekend, Putin remarked “Artificial intelligence is the future, not only for Russia, but for all humankind,” adding, “It comes with colossal opportunities, but also threats that are difficult to predict.” For once, I find myself in agreement with the President of Russia, but just this once. Artificial Intelligence offers **incredible** promise and **peril**. **Nowhere is this clearer than in the realm of national security**. Today un-crewed systems are a fact of modern warfare. Nearly every country is adopting systems where personnel are far removed from the conflict and wage war by remote control. AI [stands](https://www.nytimes.com/2016/10/26/us/pentagon-artificial-intelligence-terminator.html) to sever that ground connection. Imagine a **fully autonomous Predator or Reaper drone**. Managed by an AI system, the drone could **identify targets**, **determine their legitimacy**, and **conduct a strike** all **without human intervention.** Indeed, the Ministry of Defence of the United Kingdom issued a press [statement](https://www.theverge.com/2017/9/12/16286580/uk-government-killer-robots-drones-weapons) in September that the country “does not possess fully autonomous weapon systems and has no intention of developing them,” and that its weapons systems “will always be under control as an absolute guarantee of human oversight and authority and accountability.” Let’s think smaller. Imagine a tiny insect-sized drone loaded with explosive. Guided by a [pre-programmed AI](https://www.amazon.com/Life-3-0-Being-Artificial-Intelligence/dp/1101946598), it could hunt down a specific target — a politician, a general, or an opposition figure — determine when to strike, how to strike, and if to strike based on its own learning. Howard Hughes Medical Center [recently](https://qz.com/1000011/scientists-attached-an-electronic-backpack-to-a-genetically-modified-dragonfly-and-turned-it-into-a-drone/) attached a backpack to a genetically modified dragonfly and flew it remotely. These examples are, however, where humans are involved and largely control the left and right limits of AI. **Yet, there are examples of AI purposely and independently going beyond programed parameters.** Rogue algorithms led to a [flash crash](http://gizmodo.com/rogue-algorithm-blamed-for-historic-crash-of-the-britis-1787523587) of the British Pound. In 2016, in-game AIs **created super AIs weapons** and [**hunted down**](http://www.kotaku.co.uk/2016/06/03/elites-ai-created-super-weapons-and-started-hunting-players-skynet-is-here) **human players**, and AIs have [**created**](https://www.forbes.com/sites/tonybradley/2017/07/31/facebook-ai-creates-its-own-language-in-creepy-preview-of-our-potential-future/#1cf69787292c) **their own languages** that were **indecipherable to humans**. AIs proved more effective than their human counterparts in producing and catching users in **spear phishing programs**. Not only did the AIs create more content, they successfully [captured](https://www.blackhat.com/docs/us-16/materials/us-16-Seymour-Tully-Weaponizing-Data-Science-For-Social-Engineering-Automated-E2E-Spear-Phishing-On-Twitter.pdf) more users with their deception. While seemingly simple and low stakes in nature, **extrapolate these scenarios into more significant and risky areas and the consequences become much greater.** Cybersecurity is no different. Today we are focused on the hackers, trolls, and cyber criminals (officially sanctioned and otherwise) who seek to penetrate our networks, steal our intellectual property, and leave behind malicious code for activation in the event of a conflict. Replace the individual with an AI and imagine how fast hacking takes place; networks against networks, at machine speed all without a human in the loop. Sound far-fetched? **It’s not**. In 2016, the Defense Advanced Research Projects Agency held an AI on AI capture the flag contest called the [Cyber Grand Challenge](https://www.youtube.com/watch?v=qSgYu3w3DMM) at the DEF CON event. AI networks against AI networks. In August of this year the founders of 116 AI and robotics companies signed a letter petitioning the United Nations [to ban](https://www.theverge.com/2017/8/21/16177828/killer-robots-ban-elon-musk-un-petition) lethal autonomous systems. Signatories to this letter included Google DeepMind’s co-founder Mustafa Suleyman and Elon Musk who, in response to Putin’s quote [tweeted](https://twitter.com/elonmusk/status/904638455761612800), “Competition for AI superiority at national level most likely cause of WW3 imo (sic)”. AI is not some far off future challenge. It is a challenge today and one with which we must grapple. I am in favor of fielding any system that enhances our national security, but we must have an open and honest conversation about the implications of AI, the consequences of which **we do not**, **and may not**, **fully understand**. This is not a new type of bullet or missile. This is a potentially **fully autonomous system** that even with human oversight and guidance will make its own decisions on the battlefield and in cyberspace. How can we ensure that the system does not **escape our control?** How can we prevent such systems from falling into the hands of terrorists or insurgents? Who controls the source code? How and can we build in so-called impenetrable kill switches? AI and AI-like systems are slowly being introduced into our arsenal. Our adversaries, China, Russia, and others are also introducing AI systems into their arsenals as well. Implementation is happening faster than our ability to fully **comprehend the consequences.** Putin’s new call spells out a new arms race. **Rushing to AI weapon systems without guiding principles is a dangerous**. It risks an **escalation** that we do not fully understand and may not be able to control. The cost of limiting AI intelligence being weaponized [**could vastly exceed**](https://www.belfercenter.org/sites/default/files/files/publication/AI%20NatSec%20-%20final.pdf) **all of our nuclear proliferation efforts to date**. More troubling, the **consequences of failure are equally existential.**