## 1

### 1NC – T

#### Interpretation---“Appropriation of outer space” by private entities refers to the exercise of exclusive control of space.

TIMOTHY JUSTIN TRAPP, JD Candidate @ UIUC Law, ’13, TAKING UP SPACE BY ANY OTHER MEANS: COMING TO TERMS WITH THE NONAPPROPRIATION ARTICLE OF THE OUTER SPACE TREATY UNIVERSITY OF ILLINOIS LAW REVIEW [Vol. 2013 No. 4]

The issues presented in relation to the nonappropriation article of the Outer Space Treaty should be clear.214 The ITU has, quite blatantly, created something akin to “property interests in outer space.”215 It allows nations to exclude others from their orbital slots, even when the nation is not currently using that slot.216 This is directly in line with at least one definition of outer-space appropriation.217 [\*\*Start Footnote 217\*\*Id. at 236 (“Appropriation of outer space, therefore, is ‘the exercise of exclusive control or exclusive use’ with a sense of permanence, which limits other nations’ access to it.”) (quoting Milton L. Smith, The Role of the ITU in the Development of Space Law, 17 ANNALS AIR & SPACE L. 157, 165 (1992)). \*\*End Footnote 217\*\*]The ITU even allows nations with unused slots to devise them to other entities, creating a market for the property rights set up by this regulation.218 In some aspects, this seems to effect exactly what those signatory nations of the Bogotá Declaration were trying to accomplish, albeit through different means.219

#### Private appropriation for temporary usage or perusal is distinct from appropriation “of” outer space. Sovereign claims are still universally prohibited.

Abigail D. Pershing, J.D. Candidate @ Yale, B.A. UChicago,’19, "Interpreting the Outer Space Treaty's Non-Appropriation Principle: Customary International Law from 1967 to Today," Yale Journal of International Law 44, no. 1

II. THE FIRST SHIFT IN CUSTOMARY INTERNATIONAL LAW’S INTERPRETATION OF THE NON-APPROPRIATION PRINCIPLE Since the drafting of the Outer Space Treaty, several States have chosen to reinterpret the non-appropriation principle as narrower in scope than its drafters originally intended. This reinterpretation has gone largely unchallenged and has in fact been widely adopted by space-faring nations. In turn, this has had the effect of changing customary international law relating to the non-appropriation principle. Shifting away from its original blanket application in 1967, States have carved out an exception to the non-appropriation principle, allowing appropriation of extracted space resources.53 This Part examines this shift in the context of the two branches of the United Nation’s customary international law standard: State practice and opinio juris. A. State Practice The earliest hint of a change in customary international law relating to the interpretation of the non-appropriation clause came in 1969, when the United States first sent astronauts to the moon. As part of his historic journey, astronaut Neil Armstrong collected moonrocks that he brought back with him to Earth and promptly handed off to the National Aeronautics and Space Administration (NASA) as U.S. property.54 Later, the USSR similarly claimed lunar material as government property, some of which was eventually sold to private citizens. 55 These first instances of space resource appropriation did not draw much attention, but they presented a distinct shift marking the beginning of a new period in State practice. Having previously been limited by their technological capabilities, States could now establish new practices with respect to celestial bodies. This was the beginning of a pattern of appropriation that slowly unfolded over the next few decades and has since solidified into the general and consistent State practice necessary to establish the existence of customary international law. Currently, the U.S. government owns 842 pounds of lunar material.56 There is little question that NASA and the U.S. government consider this material, as well as other space materials collected by American astronauts, to be government property.57 In fact, NASA explicitly endorses U.S. property rights over these moon rocks, stating that “[l]unar material retrieved from the Moon during the Apollo Program is U.S. government property.”5 The U.S. delegation’s reaction to the language of the 1979 Moon Agreement further cemented this interpretation that appropriation of extracted resources is a permissible exception to the non-appropriation clause of Article II. Although the United States is not a party to the Moon Agreement, it did participate in the negotiations.59 The Moon Agreement states in relevant part: Neither the surface nor the subsurface of the moon, nor any part thereof or natural resources in place, shall become property of any State, international intergovernmental or nongovernmental organization, national organization or nongovernmental entity or of any natural person.60 In response to this language, the U.S. delegation made a statement laying out the American view that the words “in place” imply that private property rights apply to extracted resources61—a comment that went completely unchallenged. That all States seemed to accept this point, even those bound by the Moon Agreement, is further evidence of a shift in customary international law.62 B. Opinio Juris: Domestic Legislation Domestic law, both in the United States and abroad, provides further evidence of the shift in customary international law surrounding the issue of nonappropriation as it relates to extracted space resources. Domestic U.S. space law is codified at Section 51 of the U.S. Code and has been regularly modified to expand private actors’ rights in space.63 Beginning in 1984, the Commercial Space Launch Act provided that “the United States should encourage private sector launches and associated services.”64 The goal of the 1984 Act was to support commercial space launches by private companies and individuals.65 It did not, however, specifically discuss commercial exploitation of space. The first such mention of commercial use of space appeared in 2004, with the Commercial Space Launch Amendments Act.66 This Act specifically aimed at regulating space tourism but did not explicitly guarantee any private rights in space.67 The most significant change in U.S. space law came with the passage of the Spurring Private Aerospace Competitiveness and Entrepreneurship (SPACE) Act in 2015. As incorporated into Section 51 of the Code, this Act provides: A United States citizen engaged in commercial recovery of an asteroid resource or a space resource under this chapter shall be entitled to any asteroid resource or space resource obtained, including to possess, own, transport, use, and sell the asteroid resource or space resource obtained in accordance with applicable law, including the international obligations of the United States.68 Whereas the idea that private corporations might go into space may have seemed far-fetched to the drafters of the Outer Space Treaty, the SPACE Act of 2015 was the first instance of a government recognizing such a trend and officially supporting private companies’ commercial rights to space resources under law. With the new 2015 amendment to Section 51 in place, U.S. companies can now rest assured that any profits they reap from space mining are firmly legal—at least within U.S. jurisdictions. Although the United States was the first country to officially reinterpret the non-appropriation principle, other countries are following suit. On July 20, 2017, Luxembourg passed a law entitled On the Exploration and Utilization of Space Resources with a vote of fifty-five to two.69 The law took effect on August 1, 2017.70 Article 1 of the new law states simply that “[s]pace resources can be appropriated,” and Article 3 expressly grants private companies permission to explore and use space resources for commercial purposes.71 Official commentary on the law establishes that its goal is to provide companies with legal certainty regarding ownership over space materials—a goal that the commentators regard as legal under the Outer Space Treaty despite the non-appropriation principle.72 The next country to enact similar legislation may be the United Arab Emirates (UAE). According to the UAE Space Agency director general, Mohammed Al Ahbabi, the UAE is currently in the process of drafting a space law covering both human space exploration and commercial activities such as mining.73 To further this goal, in 2017 the UAE set up the Space Agency Working Group on Space Policy and Law to specify the procedures, mechanisms, and other standards of the space sector, including an appropriate legal framework.74 C. Opinio Juris: Legal Scholarship Other major space powers are also considering similar laws in the future, including Japan, China, and Australia. 75 Senior officials within China’s space program have explicitly stated that the country’s goal is to explore outer space and to take advantage of outer space resources.76 The general international trend clearly points in this direction in anticipation of a potential “space gold rush.” 7 Mirroring the shift in State practice and domestic laws, the legal community has also changed its approach to the interpretation of the nonappropriation principle. Whereas at the time of the ratification of the Outer Space Treaty the majority of legal scholars tended to apply the non-appropriation principle broadly, most legal scholars now view appropriation of extracted materials as permissible.78 Brandon Gruner underscores that this new view is historically distinct from prior legal interpretation, noting that modern interpretations of the Outer Space Treaty’s non-appropriation principle differ from those of the Treaty’s authors.79 In contrast to earlier legal theory that denied the possibility of appropriation of any space resources, scholars now widely accept that extracting space resources from celestial bodies is a “use” permitted by the Outer Space Treaty and that extracted materials become the property of the entity that performed the extraction.80 Stressing the fact that the Treaty does not explicitly prohibit appropriating resources from outer space, other authors conclude that the use of extracted space resources is permitted, meaning that the new SPACE Act is a plausible interpretation of the Outer Space Treaty.81 However, scholars have been careful to cabin the extent to which they accept the legality of appropriation. For instance, although Thomas Gangale and Marilyn Dudley-Rowley acknowledge the legality of private appropriation of extracted space resources, they nonetheless emphasize that “[o]wnership of and the right to use extraterrestrial resources is distinct from ownership of real property” and that any such claim to real property is illegal.82 Lawrence Cooper is also careful to point out this distinction: “[t]he [Outer Space] Treaties recognize sovereignty over property placed into space, property produced in space, and resources removed from their place in space, but ban sovereignty claims by states; international law extends this ban to individuals.”83 Although there remain some scholars who still insist on the illegality of the 2015 U.S. law and State appropriation of space resources generally,84 their dominance has waned since the 1960s. These scholars are now a minority in the face of general acceptance among the legal community that minerals and other space resources, once extracted, may be legally claimed as property. 85 Taken together, the elements described above—statements made in the international arena, de facto appropriation of space resources in the form of moon rocks, the adoption of new national policies permitting appropriation of extracted space resources, and the weight of the international legal community’s opinion— indicate a fundamental shift in customary international law. The Outer Space Treaty’s non-appropriation clause has been redefined via customary international law norms from its broad application to now include a carve-out allowing appropriation of space resources once such resources have been extracted.

#### Violation---they defend restricting asteroid mining, not sovereign control.

#### Standards---

#### 1] Limits—their interp explodes neg prep burdens to any space activity since affs are pushed to the fringes

#### 2] Ground—topic lit is grounded in a debate over sovereign control over space, which means core neg generics are space col bad, not mining. Their interp minimizes link uniqueness.

#### Use competing interps – reasonability invites arbitrary britelines and judge intervention.

## 2

### 1NC – DA

#### Xi’s regime is stable now, but its success depends on strong growth and private sector development.

**Mitter and Johnson 21** [Rana Mitter and Elsbeth Johnson, [Rana Mitter](https://hbr.org/search?term=rana%20mitter&search_type=search-all) is a professor of the history and politics of modern China at Oxford. [Elsbeth Johnson](https://hbr.org/search?term=elsbeth%20johnson&search_type=search-all), formerly the strategy director for Prudential PLC’s Asian business, is a senior lecturer at MIT’s Sloan School of Management and the founder of SystemShift, a consulting firm. May-June 2021, "What the West Gets Wrong About China," Harvard Business Review, [https://hbr.org/2021/05/what-the-west-gets-wrong-about-china accessed 12/14/21](https://hbr.org/2021/05/what-the-west-gets-wrong-about-china%20accessed%2012/14/21)] Adam

In China, however, growth has come in the context of stable communist rule, suggesting that democracy and growth are not inevitably mutually dependent. In fact, many Chinese believe that the country’s recent economic achievements—large-scale poverty reduction, huge infrastructure investment, and development as a world-class tech innovator—have come about because of, not despite, China’s authoritarian form of government. Its aggressive handling of Covid-19—in sharp contrast to that of many Western countries with higher death rates and later, less-stringent lockdowns—has, if anything, reinforced that view.

China has also defied predictions that its authoritarianism would inhibit its capacity to [innovate](https://hbr.org/2011/06/what-the-west-doesnt-get-about-china). It is a global leader in AI, biotech, and space exploration. Some of its technological successes have been driven by market forces: People wanted to buy goods or communicate more easily, and the likes of Alibaba and Tencent have helped them do just that. But much of the technological progress has come from a highly innovative and well-funded military that has invested heavily in China’s burgeoning new industries. This, of course, mirrors the role of U.S. defense and intelligence spending in the development of Silicon Valley. But in China the consumer applications have come faster, making more obvious the link between government investment and products and services that benefit individuals. That’s why ordinary Chinese people see Chinese companies such as Alibaba, Huawei, and TikTok as sources of national pride—international vanguards of Chinese success—rather than simply sources of jobs or GDP, as they might be viewed in the West.

Thus July 2020 polling data from the Ash Center at Harvard’s Kennedy School of Government revealed 95% satisfaction with the Beijing government among Chinese citizens. Our own experiences on the ground in China confirm this. Most ordinary people we meet don’t feel that the authoritarian state is solely oppressive, although it can be that; for them it also provides opportunity. A cleaner in Chongqing now owns several apartments because the CCP reformed property laws. A Shanghai journalist is paid by her state-controlled magazine to fly around the world for stories on global lifestyle trends. A young student in Nanjing can study propulsion physics at Beijing’s Tsinghua University thanks to social mobility and the party’s significant investment in scientific research.

#### Xi has committed to the commercial space industry as the linchpin of China’s rise – the plan is seen as a complete 180

**Patel 21** [Neel V. Patel, Neel is a space reporter for MIT Technology Review. 1-21-2021, "China’s surging private space industry is out to challenge the US," MIT Technology Review, <https://www.technologyreview.com/2021/01/21/1016513/china-private-commercial-space-industry-dominance/> accessed 12/14/21] Adam

Until recently, China’s space activity has been overwhelmingly dominated by two state-owned enterprises: the China Aerospace Science & Industry Corporation Limited (CASIC) and the China Aerospace Science and Technology Corporation (CASC). A few private space firms have been allowed to operate in the country for a while: for example, there’s the China Great Wall Industry Corporation Limited (in reality a subsidiary of CASC), which has provided commercial launches since it was established in 1980. But for the most part, China’s commercial space industry has been nonexistent. Satellites were expensive to build and launch, and they were too heavy and large for anything but the biggest rockets to actually deliver to orbit. The costs involved were too much for anything but national budgets to handle.

That all changed this past decade as the costs of making satellites and launching rockets plunged. In 2014, a year after Xi Jinping took over as the new leader of China, the Chinese government decided to treat civil space development as a key area of innovation, as it had already begun doing with AI and solar power. It issued a policy directive called [Document 60](https://archive.md/o/bc9l4/www.cpppc.org/en/zy/994006.jhtml) that year to enable large private investment in companies interested in participating in the space industry.

“Xi’s goal was that if China has to become a critical player in technology, including in civil space and aerospace, it was critical to develop a space ecosystem that includes the private sector,” says Namrata Goswami, a geopolitics expert based in Montgomery, Alabama, who’s been studying China’s space program for many years. “He was taking a cue from the American private sector to encourage innovation from a talent pool that extended beyond state-funded organizations.”

As a result, there are now 78 commercial space companies operating in China, according to a[2019 report by the Institute for Defense Analyses](https://archive.md/o/bc9l4/https:/www.ida.org/-/media/feature/publications/e/ev/evaluation-of-chinas-commercial-space-sector/d-10873.ashx). More than half have been founded since 2014, and the vast majority focus on satellite manufacturing and launch services.

For example, Galactic Energy, founded in February 2018, is building its Ceres rocket to offer rapid launch service for single payloads, while its Pallas rocket is being built to deploy entire constellations. Rival company i-Space, formed in 2016, became the first commercial Chinese company to make it to space with its Hyperbola-1 in July 2019. It wants to pursue reusable first-stage boosters that can land vertically, like those from SpaceX. So does LinkSpace (founded in 2014), although it also hopes to use rockets to deliver packages from one terrestrial location to another.

Spacety, founded in 2016, wants to turn around customer orders to build and launch its small satellites in just six months. In December it launched a miniaturized version of a satellite that uses 2D radar images to build 3D reconstructions of terrestrial landscapes. Weeks later, it [released the first images taken by the satellite](https://archive.md/o/bc9l4/https:/spacenews.com/spacety-releases-first-sar-images/), Hisea-1, featuring three-meter resolution. Spacety wants to launch a constellation of these satellites to offer high-quality imaging at low cost.

To a large extent, China is following the same blueprint drawn up by the US: using government contracts and subsidies to give these companies a foot up. US firms like SpaceX benefited greatly from NASA contracts that paid out millions to build and test rockets and space vehicles for delivering cargo to the International Space Station. With that experience under its belt, SpaceX was able to attract more customers with greater confidence.

Venture capital is another tried-and-true route. The IDA report estimates that VC funding for Chinese space companies was up to $516 million in 2018—far shy of the $2.2 billion American companies raised, but nothing to scoff at for an industry that really only began seven years ago. At least 42 companies had no known government funding.

And much of the government support these companies do receive doesn’t have a federal origin, but a provincial one. “[These companies] are drawing high-tech development to these local communities,” says Hines. “And in return, they’re given more autonomy by the local government.” While most have headquarters in Beijing, many keep facilities in Shenzhen, Chongqing, and other areas that might draw talent from local universities.

There’s also one advantage specific to China: manufacturing. “What is the best country to trust for manufacturing needs?” asks James Zheng, the CEO of Spacety’s Luxembourg headquarters. “It’s China. It’s the manufacturing center of the world.” Zheng believes the country is in a better position than any other to take advantage of the space industry’s new need for mass production of satellites and rockets alike.

Making friends

The most critical strategic reason to encourage a private space sector is to create opportunities for international collaboration—particularly to attract customers wary of being seen to mix with the Chinese government. (US agencies and government contractors, for example, are barred from working with any groups the regime funds.) Document 60 and others issued by China’s National Development and Reform Commission were aimed not just at promoting technological innovation, but also at drawing in foreign investment and maximizing a customer base beyond Chinese borders.

“China realizes there are certain things they cannot get on their own,” says Frans von der Dunk, a space policy expert at the University of Nebraska–Lincoln. Chinese companies like LandSpace and MinoSpace have worked to accrue funding through foreign investment, escaping dependence on state subsidies. And by avoiding state funding, a company can also avoid an array of restrictions on what it can and can’t do (such as constraints on talking with the media). Foreign investment also makes it easier to compete on a global scale: you’re taking on clients around the world, launching from other countries, and bringing talent from outside China.

Although China is taking inspiration from the US in building out its private industry, the nature of the Chinese state also means these new companies face obstacles that their rivals in the West don’t have to worry about. While Chinese companies may look private on paper, they must still submit to government guidance and control, and accept some level of interference. It may be difficult for them to make a case to potential overseas customers that they are independent. The distinction between companies that are truly private and those that are more or less state actors is still quite fuzzy, especially if the government is a frequent customer. “That could still lead to a lack of trust from other partners,” says Goswami. It doesn’t help that the government itself is often [very cagey about what its national program is even up to](https://archive.md/o/bc9l4/https:/www.bbc.com/news/science-environment-54076895).

And Hines adds that it’s not always clear exactly how separate these companies are from, say, the People’s Liberation Army, given the historical ties between the space and defense sectors. “Some of these things will pose significant hurdles for the commercial space sector as it tries to expand,” he says.

#### Nationalist officials spark intraparty conflict--Xi will launch diversionary war to domestic backlash – escalates in multiple hotspots

Norris 17, William J. Geostrategic Implications of China’s Twin Economic Challenges. CFR Discussion Paper, 2017. (Associate professor of Chinese foreign and security policy at Texas A&M University’s Bush School of Government and Public Service)//Elmer

Populist pressures might tempt the **party leadership** to encourage **diversionary nationalism**. The logic of this concern is straightforward: the Communist Party might seek to **distract a restless domestic population** with **adventurism abroad**.19 The **Xi** administration wants to **appear tough** in its **defense of foreign encroachments** against China’s interests. This need stems from a long-running narrative about how a weak Qing dynasty was unable to defend China in the face of European imperial expansion, epitomized by the Opium Wars and the subsequent treaties imposed on China in the nineteenth century. The party is **particularly sensitive** to **perceptions of weakness** because much of its **claim to legitimacy**—manifested in **Xi’s Chinese Dream** campaign today—stems from the party’s claims of leading the **restoration of Chinese greatness**. For example, the May Fourth Movement, a popular protest in 1919 that helped catalyze the CPC, called into question the legitimacy of the Republic of China government running the country at that time because the regime was seen as not having effectively defended China’s territorial and sovereignty interests at the Versailles Peace Conference. **Diversionary nationalist frictions** would likely occur if the Chinese leadership portrayed a foreign adversary as having made the first move, thus forcing Xi to stand up for China’s interests. An example is the 2012 attempt by the nationalist governor of Tokyo, Shintaro Ishihara, to buy the Senkaku/Diaoyu Islands from a private owner.20 Although the Japanese central government sought to avert a crisis by stepping in to purchase the islands—having them bought and administered by Ishihara’s Tokyo metropolitan government would have dragged Japan into a confrontation with China—China saw this move as part of a deliberate orchestration by Japan to nationalize the islands. Xi seemingly had no choice but to defend China’s claims against an attempt by Japan to consolidate its position on the dispute.21 This issue touched off a period of heated tensions between China and Japan, lasting more than two years.22 Such dynamics are not limited to Japan. Other possible areas of conflict include, but are not necessarily limited to, **Taiwan**, **India**, and the **South China Sea** (especially with the **Philippines** and **Vietnam**). The Chinese government will use such tactics if it believes that the costs are relatively low. Ideally, China would like to appear tough while avoiding material repercussions or a serious diplomatic breakdown. Standing up against foreign encroachment—without facing much blowback—could provide Xi’s administration with a tempting source of noneconomic legitimacy. However, over the next few years, Xi will probably not be actively looking to get embroiled abroad. Cushioning the fallout from slower growth while managing a structural economic transition will be difficult enough. Courting potential international crises that distract the central leadership would make this task even more daunting. Even if the top leadership did not wish to provoke conflict, a smaller budgetary allotment for security could cause **military interests** in China to **deliberately instigate trouble** to **justify** their **claims over increasingly scarce resources**. For example, an air force interested in ensuring its funding for a midair tanker program might find the existence of far-flung territorial disputes to be useful in making its case. Such a case would be made even stronger by a pattern of recent frictions that highlights the necessity of greater air power projection. Budgetary pressures may be partly behind a recent People’s Liberation Army reorganization and headcount reduction. A slowing economy might cause a further deceleration in China’s military spending, thus increasing such pressures as budgetary belts tighten. Challenges to Xi’s Leadership Xi Jinping’s efforts to address economic challenges could fail, unleashing consequences that extend well beyond China’s economic health. For example, an **economic collapse** could give rise to a Vladimir **Putin–like redemption figure** in China. Xi’s approach of centralizing authority over a diverse, complex, and massive social, political, and economic system is a **recipe for brittleness**. Rather than designing a resilient, decentralized governance structure that can gracefully cope with localized failures at particular nodes in a network, a highly centralized architecture **risks catastrophic**, **system-level failure**. Although centralized authority offers the tantalizing chimera of stronger control from the center, it also puts all the responsibility squarely on Xi’s shoulders. With China’s ascension to great power status, the consequences of internecine domestic political battles are increasingly playing out on the world stage. The international significance of China’s domestic politics is a new paradigm for the Chinese leadership, and one can expect an adjustment period during which the outcome of what had previously been relatively insulated domestic political frictions will likely generate **unintended international repercussions**. Such dynamics will influence Chinese foreign policy and security behavior. Domestic arguments over ideology, bureaucratic power struggles, and strategic direction could all have **ripple effects abroad**. Many of China’s party heavyweights still employ a narrow and exclusively domestic political calculus. Such behavior increases the possibility of international implications that are not fully anticipated, **raising the risks** of **strategic miscalculation** on the world stage. For example, the factional power struggles that animated the Cultural Revolution were largely driven by domestic concerns, yet manifested themselves in Chinese foreign policy for more than a decade. During this period, China was not the world’s second largest economy and, for much of this time, did not even have formal representation at the United Nations. If today’s globally interconnected China became engulfed in similar domestic chaos, the effects would be felt worldwide.23 Weakened Fetters of Economic Interdependence If China successfully transitioned away from its export-driven growth model toward a consumption-driven economic engine over the next four or five years, it could no longer feel as constrained by economic interdependence. To the extent that such constraints are loosened, the U.S.-China relationship will be more prone to conflict and friction.24 While China has never been the archetypal liberal economic power bent on benign integration with the global economy, its export-driven growth model produced a strong strategic preference for stability. Although past behavior is not necessarily indicative of future strategic calculus, China’s “economic circuit breaker” logic seems to have held its most aggressive nationalism below the threshold of war since 1979. A China that is both comparatively strong and less dependent on the global economy would be a novel development in modern geopolitics. As China changes the composition of its international economic linkages, global integration could place fewer constraints on it. Whereas China has been highly reliant on the import of raw materials and semifinished goods for reexport, a consumption-driven China could have a different international trade profile. China could still rely on imported goods, but their centrality to the country’s overall economic growth would be altered. Imports of luxury goods, consumer products, international brands, and services may not exert a significant constraining influence, since loss of access to such items may not be seen as strategically vital. If these flows were interrupted or jeopardized, the result would be more akin to an inconvenience than a strategic setback for China’s rise. That said, China is likely to continue to highly depend on imported oil even if the economic end to which that energy resource is directed shifts away from industrial and export production toward domestic consumption.

#### US–China war goes nuclear – crisis mis-management ensures conventional escalation - extinction

Kulacki 20 [Dr. Gregory Kulacki focuses on cross-cultural communication between the United States and China on nuclear and space arms control and is the China Project Manager for the Global Security Program at the Union of Concerned Scientists, 2020. Would China Use Nuclear Weapons First In A War With The United States?, Thediplomat.com, https://thediplomat.com/2020/04/would-china-use-nuclear-weapons-first-in-a-war-with-the-united-states/] srey

Admiral Charles A. Richard, the head of the U.S. Strategic Command, recently told the Senate Armed Service Committee he “could drive a truck” through the holes in China’s no first use policy. But when Senator John Hawley (R-MO) asked him why he said that, Commander Richard backtracked, described China’s policy as “very opaque” and said his assessment was based on “very little” information. That’s surprising. **China** has been exceptionally **clear** **about** its **intentions** **on** the possible **first** **use** **of** **nuclear** **weapons**. On the day of its first nuclear test on October 16, 1964, China declared it “will never at any time or under any circumstances be the first to use nuclear weapons.” That **unambiguous** **statement** **has** **been** a **cornerstone** **of** **Chinese** **nuclear** **weapons** policy for 56 years and has been repeated frequently in authoritative Chinese publications for domestic and international audiences, including a highly classified training manual for the operators of China’s nuclear forces. Richard should know about those publications, particularly the training manual. A U.S. Department of Defense translation has been circulating within the U.S. nuclear weapons policy community for more than a decade. The commander’s comments to the committee indicate a familiarity with the most controversial section of the manual, which, in the eyes of some U.S. analysts, indicates there may be some circumstances where **China** **would** **use** **nuclear** **weapons** **first** **in** a **war** **with** **the** **U**nited **S**tates. This U.S. misperception is understandable, especially given the difficulties the Defense Department encountered translating the text into English. The language, carefully considered in the context of the entire book, articulates a strong reaffirmation of China’s no first use policy. But it also reveals **Chinese** military planners are **struggling** **with** **crisis** **management** **and** **considering** **steps** **that** could **create** **ambiguity** **with** **disastrous** **consequences**. Towards the end of the 405-page text on the operations of China’s strategic rocket forces, in a chapter entitled, “Second Artillery Deterrence Operations,” the authors explain what China’s nuclear forces train to do if **“**a strong military power possessing nuclear‐armed missiles and an absolute advantage in high‐tech conventional weapons is carrying out intense and continuous attacks against our major strategic targets and we have no good military strategy to resist the enemy.**”** The military power they’re talking about is the United States. The authors indicate China’s nuclear missile forces train to take specific steps, including increasing readiness and conducting launch exercises, to “dissuade the continuation of the strong enemy’s conventional attacks.” The manual refers to these steps as an “adjustment” to China’s nuclear policy and a “lowering” of China’s threshold for brandishing its nuclear forces. Chinese leaders would only take these steps in extreme circumstances. The text highlights several triggers such as U.S. conventional bombing of China’s nuclear and hydroelectric power plants, heavy conventional bombing of large cities like Beijing and Shanghai, or other acts of **conventional** **warfare** **that** “**seriously** **threatened**” the “safety and **survival**” of the nation. U.S. Misunderstanding Richard seems to believe this planned adjustment in China’s nuclear posture means China is **preparing** **to** **use** **nuclear** **weapons** first under these circumstances. He told Hawley that there are a “number of situations where they may conclude that first use has occurred that do not meet our definition of first use.” The head of the U.S. Strategic Command appears to assume, as do other U.S. analysts, that the **Chinese** would **interpret** **these** types of U.S. conventional **attacks** **as** **equivalent** **to** a **U.S. first use** **of** **nuclear** **weapons** against China. But that’s not what the text says. “Lowering the threshold” refers to China putting its nuclear weapons on alert — it does not indicate Chinese leaders might lower their threshold for deciding to use nuclear weapons in a crisis. Nor does the text indicate Chinese nuclear forces are training to launch nuclear weapons first in a war with the United States. China, unlike the United States, keeps its nuclear forces off-alert. Its warheads are not mated to its missiles. China’s nuclear-armed submarines are not continuously at sea on armed patrols. The manual describes how China’s nuclear warheads and the missiles that deliver them are controlled by two separate chains of command. Chinese missileers train to bring them together and launch them after China has been attacked with nuclear weapons. All of these behaviors are consistent with a no first use policy. The “adjustment” Chinese nuclear forces are preparing to make if the United States is bombing China with impunity is to place China’s nuclear forces in a state of readiness similar to the state the nuclear forces of the United States are in all the time. This step is intended not only to end the bombing, but also to convince U.S. decision-makers they cannot expect to destroy China’s nuclear retaliatory capability if the crisis escalates. Chinese Miscalculation Unfortunately, alerting Chinese nuclear forces at such a moment could have terrifying consequences. Given the relatively small size of China’s nuclear force, a U.S. president might be tempted to try to limit the possible damage from a Chinese nuclear attack by destroying as many of China’s nuclear weapons as possible before they’re launched, especially if the head of the U.S. Strategic Command told the president China was preparing to strike first. One study concluded that if the United States used nuclear weapons to attempt to knock out a small fraction of the Chinese ICBMs that could reach the United States it may kill tens of millions of Chinese civilians. The authors of the text assume alerting China’s nuclear forces would “create a great shock in the enemy’s psyche.” That’s a fair assumption. But they also assume this shock could “dissuade the continuation of the strong enemy’s conventional attacks against our major strategic targets.” That’s highly questionable. There is a **substantial** **risk** **the** **U**nited **S**tates **would** **respond** **to** this implicit **Chinese** **threat** **to** **use** **nuclear** **weapons** **by** **escalating**, rather than halting, its **conventional** **attacks**. If China’s nuclear forces were targeted, it would put even greater strain on the operators of China’s nuclear forces. A **slippery** **slope** **to** **nuclear** **war** Chinese military planners are aware that attempting to coerce the United States into halting conventional bombardment by alerting their nuclear forces could fail. They also know it might trigger a nuclear war. But if it does, they are equally clear China won’t be the one to start it. Nuclear attack is often preceded by nuclear coercion. Because of this, in the midst of the process of a high, strong degree of nuclear coercion we should prepare well for a nuclear retaliatory attack. The more complete the preparation, the higher the credibility of nuclear coercion, the easier it is to accomplish the objective of nuclear coercion, and the lower the possibility that the nuclear missile forces will be used in actual fighting. They assume if China demonstrates it is well prepared to retaliate the United States would not risk a damage limitation strike using nuclear weapons. And even if the United States were to attack China’s nuclear forces with conventional weapons, China still would not strike first. In the opening section of the next chapter on “nuclear retaliatory attack operations” the manual instructs, as it does on numerous occasions throughout the entire text: According to our country’s principle, its stand of no first use of nuclear weapons, the Second Artillery will carry out a nuclear missile attack against the enemy’s important strategic targets, according to the combat orders of the Supreme Command, only after the enemy has carried out a nuclear attack against our country. Richard is wrong. There are no holes in China’s no first use policy. But the worse-case planning articulated in this highly classified military text is a significant and deeply troubling departure from China’s traditional thinking about the role of nuclear weapons. Mao Zedong famously called nuclear weapons “a paper tiger.” Many assumed he was being cavalier about the consequences of nuclear war. But what he meant is that they would not be used to fight and win wars. U.S. nuclear threats during the Korean War and the Taiwan Strait Crisis in the 1950s – threats not followed by an actual nuclear attack – validated Mao’s intuition that nuclear weapons were primarily psychological weapons. Chinese leaders decided to acquire nuclear weapons to free their minds from what Mao’s generation called “**nuclear** **blackmail**.” A former director of China’s nuclear weapons laboratories told me China developed them so its leaders could “sit up with a straight spine.” Countering nuclear blackmail – along with compelling other nuclear weapons states to negotiate their elimination – were the only two purposes Chinese nuclear weapons were meant to serve. Contemporary Chinese military planners appear to have added a new purpose: compelling the United States to halt a conventional attack. Even though it only applies in extreme circumstances, it **increases** the **risk** **that** a **war** between the United States and China **will** **end** **in** a nuclear exchange with unpredictable and **catastrophic** **consequences**. Adding this new purpose could also be the first step on a slippery slope to an incremental broadening the role of nuclear weapons in Chinese national security policy. Americans would be a lot safer if we could avoid that. The United States government should applaud China’s no first use policy instead of repeatedly calling it into question. And it would be wise to adopt the same policy for the United States. If both countries declared they would never use nuclear weapons first it may not guarantee they can avoid a nuclear exchange during a military crisis, but it would make one far less likely.

## Mining

### Debris

#### 1] Non UQ – squo debris thumps

Orwig 16 [(Jessica, MS in science and tech journalism from Texas A&M, BS in astronomy and physics from Ohio State) “Russia says a growing problem in space could be enough to spark a war,” Insider,’ January 26, 2016, <https://www.businessinsider.com/russia-says-space-junk-could-spark-war-2016-1>] TDI

NASA has already [warned that](https://www.businessinsider.com/space-junk-at-critical-density-2015-9) the large amount of space junk around our planet is growing beyond our control, but now a team of Russian scientists has cited another potentially unforeseen consequence of that debris: War.

Scientists estimate that anywhere from 500,000 to 600,000 pieces of human-made space debris between 0.4 and 4 inches in size are currently orbiting the Earth and traveling at speeds over [17,000 miles per hour](https://www.nasa.gov/mission_pages/station/news/orbital_debris.html).

If one of those pieces smashed into a military satellite it "may provoke political or even armed conflict between space-faring nations," Vitaly Adushkin, a researcher for the Institute of Geosphere Dynamics at the Russian Academy of Sciences, reported in a paper set to be published in the peer-reviewed journal [Acta Astronautica](https://www.sciencedirect.com/science/article/pii/S0094576515303416), which is sponsored by the International Academy of Astronautics.

#### 2] Warming exponentially increases space debris—

O’Callaghan 21 (Jonathan, freelance space and science journalist that specializes in commercial spaceflight, space exploration, astronomy, and astrophysics, “What if Space Junk and Climate Change Become the Same Problem?”, May 24, 2021, <https://www.nytimes.com/2021/05/12/science/space-junk-climate-change.html>) CS

It’s easy to compare the space junk problem to climate change. Human activities leave too many dead satellites and fragments of machinery discarded in Earth orbit. If left unchecked, space junk could pose significant problems for future generations — rendering access to space increasingly difficult, or at worst, [impossible](https://www.nytimes.com/2007/02/06/science/space/06orbi.html).

Yet the two may come to be linked. Our planet’s atmosphere naturally pulls orbiting debris downward and incinerates it in the thicker lower atmosphere, but **increasing carbon dioxide levels** are [lowering the density](https://www.nsf.gov/news/news_summ.jsp?cntn_id=108187) of the upper atmosphere, which may **diminish this effect**. A study [presented last month](https://space-debris-conference.sdo.esoc.esa.int/page/programme) at the European Conference on Space Debris says that the problem has been underestimated, and that the amount of space junk in orbit could, in a worst-case scenario, **increase 50 times by 2100**.

“The numbers took us by surprise,” said Hugh Lewis, a space debris expert from the University of Southampton in England and a co-author on the paper, which will be submitted for peer review in the coming months. “There is **genuine cause for alarm**.”

Our atmosphere is a useful ally in clearing up space junk. Collisions with its molecules cause drag, pulling objects back into the atmosphere. Below 300 miles above the surface, most objects will naturally decay into the thicker lower atmosphere and burn up in [less than 10 years](https://www.spaceacademy.net.au/watch/debris/orblife.htm).

At lower altitudes, [infrared radiation](https://scied.ucar.edu/learning-zone/how-climate-works/carbon-dioxide-absorbs-and-re-emits-infrared-radiation) is trapped by the thick atmosphere as heat. But above 60 miles where the atmosphere is thinner, the opposite is true. “There’s nothing to recapture that energy,” said Matthew Brown, also from the University of Southampton and the paper’s lead author. “So it gets lost into space.”

The escape of heat causes the volume of the atmosphere to decrease. This results in atmospheric contraction, which reduces its density at a given altitude. Since 2000, Mr. Brown and his team say the atmosphere at 250 miles has lost [21 percent of its density](https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2021JD034589) because of rising carbon dioxide levels. By 2100, if carbon dioxide levels double their current levels — in line with the [worst-case scenario](https://www.weforum.org/agenda/2020/09/the-worst-case-climate-change-scenario-could-look-like-this-we-need-to-avert-it/) assessment by the Intergovernmental Panel on Climate Change — that number could rise to 80 percent.

**For space junk, the implications are stark**. More than [2,500 objects](https://platform.leolabs.space/visualization) larger than four inches in size currently orbit at or below an altitude of 250 miles. In the worst-case scenario, increased orbital lifetimes of up to 40 years would mean fewer items are dragged into the lower atmosphere. **Objects** at this altitude would **proliferate by 50 times to about 125,000.**

Even in a best-case scenario, where carbon dioxide levels stabilize or even reverse, the amount of space junk would still be expected to double. Mr. Brown thinks a more probable outcome is somewhere in between, perhaps a 10 or 20 times increase.

The research is “very important work,” said John Emmert, an atmospheric scientist at the U.S. Naval Research Laboratory in Washington, D.C., who has studied atmospheric density loss. However, Dr. Emmert says more research is needed to understand the severity of the problem — with the impact of the sun’s solar cycle also known to be a [major factor](https://ui.adsabs.harvard.edu/abs/1989JSpRo..26..439W/abstract#:~:text=Because%20density%20is%20mainly%20an,respect%20to%20the%20temperature%20change.&text=The%20atmospheric%20drag%20on%20satellites,on%20satellite%20lifetimes%20are%20profound.) in atmospheric density changes.

The findings may also pose challenges for regulators and satellite operators, **especially SpaceX, Amazon and other companies** seeking to build megaconstellations of thousands of satellites to beam internet service down to the ground from low Earth orbit.

Just last month, for example, the U.S. Federal Communications Commission approved a request from SpaceX to [decrease the orbits](https://arstechnica.com/tech-policy/2021/04/fcc-lets-spacex-cut-satellite-altitude-to-improve-starlink-speed-and-latency/) of nearly 3,000 satellites in its [Starlink constellation](https://www.nytimes.com/2019/11/11/science/spacex-starlink-satellites.html), reasoning that atmospheric drag would naturally sweep up dead satellites and debris in a reasonable amount of time.

Research by Mr. Brown and his team suggests that assumption may be flawed.

An F.C.C. spokesman said that most of its applicants currently used NASA’s [Debris Assessment Software](https://orbitaldebris.jsc.nasa.gov/mitigation/debris-assessment-software.html) to predict lifetimes of satellites in low Earth orbit. “We do not know at this time if there are any plans to change that program to address the changes in atmospheric composition predicted in the paper,” he said. “The F.C.C. periodically reviews its rules and regulations and updates them consistent with developments in the marketplace and in scientific knowledge.”

SpaceX did not respond to a request for comment.

Dr. Lewis said that he suspected that some of the modeling, however, relies on outdated data, and that more needed to be done to actively remove satellites and debris from orbit rather than relying on the passive atmospheric effect. “Operators have to make this aspect of the mission a priority,” he said.

Even a moderate increase in lifetimes for large constellations could pose significant problems. “If SpaceX’s spacecraft re-enter passively in 10 or 15 years, would you argue that’s good enough?” Dr. Lewis said. “Given the fact that it’s a large constellation, lots of people would say probably not.”

#### 3] Anti-missile satellite tests proliferates space debris, spray is just as strike-prone as clusters – aff insufficient

Omaly 21 (Pierre, an engineer at the Center National d'Etudes Spatiales (CNES) he holds the position of space debris expert and manager of the Tech 4 Space Care initiative within the Orbital Systems Directorate in the Space Flight Safety Department, “Destroyed Russian satellite creates yet more space debris to threaten the International Space Station“, November 17, 2021, <https://theconversation.com/destroyed-russian-satellite-creates-yet-more-space-debris-to-threaten-the-international-space-station-172078>)

On Monday 15 November, Russia [destroyed](https://edition.cnn.com/2021/11/15/politics/russia-anti-satellite-weapon-test-scn/index.html) one of its old satellites in an anti-satellite missile test.

The impact created a cloud of space debris in an area of space through which the International Space Station regularly passes, and members of the ISS were forced to seek safety in their spacecraft in the immediate aftermath of the test.

The US 18th Space Control Squadron confirmed the breakup of the COSMOS-1408 satellite on November 16. It estimates that there could be around 1,500 new pieces of debris floating through space as a result of the incident.

There is a vast amount of debris circulating in Earth’s orbit: it is one of the inherent consequences of human activity in space.

The first debris arrived in 1957 with the launch of Sputnik-1. More than 5,000 launches have taken place since then – generating 23,200 catalogued objects larger than 10 centimetres across, which represent 99% of the total mass in orbit, more than 8,000 tonnes.

The launches have also generated about 740,000 objects between 1 and 10 centimetres in size, as well as more than 160,000 objects between 0.1 and 1 centimetres.

In recent years, new satellite constellations launched by private companies have put more objects into orbit than the country of France has in its entire history.

In Earth’s orbit, there are operational satellites, end-of-life satellites, abandoned launch vehicle stages and fragments of all sizes, mainly from accidental or deliberate explosions or the ageing of materials in space.

Objects in low orbit (an altitude of less than 2,000km) travel at very high velocity. At eight kilometres per second, a piece of debris can inflict significant damage on an operational satellite in the event of a collision.

Two major events have generated a significant amount of the space debris currently in orbit. In 2007, China deliberately destroyed one its own satellites in an [anti-missile weapon test](https://www.cfr.org/backgrounder/chinas-anti-satellite-test), with 3,527 pieces of identified debris still in orbit in March 2021. Then, in 2009, the [American satellite Iridium 33 and the Russian satellite Cosmos 2251](https://link.springer.com/chapter/10.1007/978-3-7091-0318-0_10) collided in orbit. This event alone doubled the amount of debris over 10 centimetres currently circulating.

Some of the pieces of unidentified debris (those smaller than 10 centimetres) came down and burned up on re-entering the atmosphere. Despite this, there are probably still a number that cannot be seen because they are too small but which nevertheless pose a danger to operational satellites.

Space debris can also pose a risk on the ground if large fragments fall back to Earth. Statistically, one large piece of debris falls to the Earth’s surface every week (mostly into the sea).

To date there have been no fatalities caused by falling space debris. One person was reportedly hit on the shoulder [in the United States](https://www.wired.com/2009/01/jan-22-1997-heads-up-lottie-its-space-junk/) in 1997, and a piece of debris over 10 metres long from a Chinese rocket [fell to Earth in Cote d’Ivoire](https://www.theverge.com/2020/5/13/21256484/china-rocket-debris-africa-uncontrolled-reentry-long-march-5b) in 2020.

### Pollution

#### Reducing pollution accelerates global warming

Potscavage 21[William, Professor at Kyushu University of Japan, “Air pollutant reductions could enhance global warming without greenhouse gas cuts”, https://www.eurekalert.org/news-releases/606522]//gk

As countries around the world race to mitigate global warming by limiting carbon dioxide emissions, an unlikely source could be making climate goals harder to achieve without even deeper cuts in greenhouse gas production: reductions in air pollution. New modeling experiments from Kyushu University in Japan of the long-term effects of reductions in pollutants known as sulfate aerosols predicts further increases in surface air temperature at current and increased carbon dioxide levels because of the loss of an overall cooling effect caused by the light-scattering particles. "Air pollution causes an estimated seven million premature deaths per year worldwide, so action is essential, especially in emerging and developing countries, which tend to be most affected," says Toshihiko Takemura, professor at Kyushu University's Research Institute for Applied Mechanics and author of the study. "However, reductions in air pollutants must come hand in hand with reductions in greenhouse gases to avoid accelerating global warming." To analyze how sulfate aerosols--small particles of sulfur-containing compounds often produced by burning fossil fuels or biomass--influence climate, Takemura used a combination of models known as MIROC-SPRINTARS. MIROC is a general circulation model taking into account many key aspects of the atmosphere and oceans along with their interactions, while SPRINTARS, which is widely used by news outlets for air pollution forecasts, is capable of predicting the mixing of aerosols in the atmosphere. Combining the two models allows for effects such as the scattering and absorption of light by aerosols and the interaction of aerosols with clouds to be included in the climate projection. Looking at the immediate changes to the atmosphere in the case of reduced emission of SO2--a precursor of sulfate aerosols--from fuel sources, Takemura found that changes such as in light scattering and cloud formation by the sulfate aerosols lead to more energy overall entering the atmosphere, though the increase is similar regardless of whether the atmospheric carbon dioxide concentration is the same as present levels or doubled. However, considering changes in the climate and surface temperatures over longer time scales showed that not only does the surface air temperature increase with a reduction in sulfate aerosols but this increase is even larger when carbon dioxide levels double. "Although the fast response is similar for both situations, long-term changes caused by more slowly responding factors related to interactions with the oceans and subsequent changes, such as in clouds and precipitation, eventually leads to a bigger temperature increase," explains Takemura. "Thus, global warming will accelerate unless increases in greenhouse gas concentrations are suppressed as air pollution control measures decrease sulfate aerosol concentrations, further emphasizing the urgency for reducing carbon dioxide in the atmosphere," he concludes.

#### Short-term acceleration of warming causes methane bursts - causes positive feedback loops, collapse of ag, ocean acidification, and lighting methane fireballs -- existential

Shankman 2/4/17

(Research Finds Hope in Slowing Arctic's Climate-Warming Black Carbon, “Research Finds Hope in Slowing Arctic's Climate-Warming Black Carbon,” pg online @ https://insideclimatenews.org/news/03022017/arctic-climate-change-black-carbon-global-warming-siberia //ghs-ef)

Researchers have developed a new method for determining the source of black carbon—a particularly nasty type of pollution that can blanket the Arctic—giving some hope that this known accelerator of climate change could be slowed. Black carbon, the soot that darkens the sea ice, causing it to absorb heat from the sun instead of reflecting it, speeds up the rate at which the ice disappears. It's yet another severe aspect of climate change—except that its lifespan is just days or weeks, as opposed to carbon dioxide's, which can last a century or more. That means that finding its source and mitigating its effects can have an almost immediate impact, and might hold a key for helping slow the rapid melting of the Arctic. A new study, released earlier this week in the scientific journal PNAS, provides "a very powerful tool" in combating black carbon, said Scripps Institution of Oceanography atmospheric scientist Veerabhadran Ramanathan, who was not a part of the study. "It's a new tool for understanding who is emitting what and when," he said. Black carbon can travel thousands of miles from where it is initially emitted, so finding the source of the pollution can make it more feasible for policymakers to attempt to stop it. The authors of the study gathered two years of black carbon data from eastern Siberia—a remote, sparsely populated region—and developed the method for determining the source. By analyzing the isotopes of the black carbon samples, the authors determined that black carbon in the region was coming primarily from transportation and home heating with coal or biomass. The isotope analysis was then compared with data from observation-based models and inventories of known emissions of black carbon. When they began the study, the authors had expected the biggest sources of black carbon would be gas flaring and power plants. "The results related to gas flaring were probably the biggest surprise," said author Patrik Winiger, an applied environmental scientist at Stockholm University. Instead, they saw that vehicles and residential sources were the main offenders, often coming all of the way from China, elsewhere in Russia and Europe. Winiger worked on the project from Sweden, while local technicians in Tiksi, Russia sent data at regular intervals. This coordination was a key element in the study, as bringing samples across borders can pose problems for traveling scientists, Winiger said. Winiger and his colleagues analyzed the isotopes that made up each sample, each of which look different depending on the source. "Given that we have precise isotopic fingerprints, we can tell you exactly how much carbon is coming from where," Winiger said. One of the most novel elements of the study is that the authors had data out of that region at all. Siberia makes up nearly half of the Arctic region, and yet it is rare to have observations and data from there. Climate experts from the United Nations Environment Program and the World Meteorological Organization have determined that black carbon is 100 to 2,000 times more potent in warming the atmosphere than carbon dioxide. As the PNAS study authors show, the soot can travel long distances, landing in the Arctic and exacerbating an already dire climate situation there. The Arctic is warming at twice the rate of the rest of the world and the past year in particular has been marked by record-breaking high temperatures and low levels of sea ice. As the sea ice melts, it exposes the dark ocean below. Instead of radiating some of the sun's rays back into the atmosphere, the way the white surface of sea ice can, the ocean absorbs the sun's heat, warming the planet more. Black carbon adds a secondary element to that process. When the soot covers the ice, it darkens the surface, absorbing more heat from the sun. It also speeds up the melting of snow. Though scientists agree any global mitigation efforts have to center on immediately and drastically lowering carbon dioxide emissions, those changes have been politically difficult, opposed by powerful forces and may not happen in time to save the Arctic. But at least theoretically, slowing black carbon could offer some hope. Knowing the source can help policymakers target their efforts more quickly and efficiently, if there's political will for it.

### Fisheries

#### 1] Fisheries create mass food shortages.

Science Daily, Jan. 19, 2021. “Scientists to global policymakers: Treat fish as food to help solve world hunger,” Retrieved Apr. 30, 2021 from [https://www.sciencedaily.com/releases/ 2021/01/210119122051.htm](https://www.sciencedaily.com/releases/%202021/01/210119122051.htm)

Scientists are urging global policymakers and funders to think of fish as a solution to food insecurity and malnutrition, and not just as a natural resource that provides income and livelihoods, in a newly-published paper in the peer-reviewed journal Ambio. Titled "Recognize fish as food in policy discourse and development funding," the paper argues for viewing fish from a food systems perspective to broaden the conversation on food and nutrition security and equity, especially as global food systems will face increasing threats from climate change. The "Fish as Food" paper, authored by scientists and policy experts from Michigan State University, Duke University, Harvard University, World Bank and Environmental Defense Fund, among others, notes the global development community is not on track to meet goals for alleviating malnutrition. According to the U.N. Food and Agriculture Organization, the number of malnourished people in the world will increase from 678 million in 2018 to 841 million in 2030 if current trends continue -- an estimate not accounting for effects of the COVID-19 pandemic. Fish provide 17% of the animal protein consumed globally and are rich in micronutrients, essential fatty acids and protein essential for cognitive development and maternal and childhood health, especially for communities in developing countries where fish may be the only source of key nutrients. Yet fish is largely missing from key global food policy discussions and decision-making. "Fish has always been food. But in this paper, we lay out an agenda for enhancing the role of fish in addressing hunger and malnutrition," says Abigail Bennett, assistant professor in the Center for Systems Integration and Sustainability in the Department of Fisheries and Wildlife at Michigan State University. "We are urging the international development community not only to see fish as food but to recognize fish as a nutrient-rich food that can make a difference for the well-being of the world's poor and vulnerable. What kinds of new knowledge, policies and interventions will be required to support that role for fish?" she adds. The United Nations' Sustainable Development Goal 2, Zero Hunger, does not mention fisheries or aquaculture by name, nor does it offer specific guidance on fish production systems. Fish also appear underrepresented in international development funding priorities, such as by the World Bank, the paper finds. "Fish -- and aquatic foods in general -- are largely ignored in the food policy dialogue," says Kristin Kleisner, lead senior scientist for Environmental Defense Fund Oceans program and a co-author of the paper. "This is a huge oversight, as fish offer a critical source of nutrition unparalleled by any other type of food, and it is often the only source of key nutrients for vulnerable populations around the world. "By refocusing on nutrition, in addition to the many other benefits fisheries provide, we're amplifying a call to action for governments, international development organizations and society more broadly to invest in the sustainability of capture fisheries and aquaculture," adds Kleisner. "Fisheries will be ever more important as the world faces mounting challenges to feed itself," says Kelly Brownell, director of the World Food Policy Center at Duke University. Global policymakers and funders framing fish as food, the authors state, can encourage innovative policies and actions to support the role of fish in global food and nutrition security. The paper identifies four pillars of suggested action to begin framing fish as food, not just a natural resource. These pillars are: Improve metrics. There is currently a paucity of metrics to assess and communicate the contributions of fish to food and nutrition security. Governments and researchers can collaborate to develop better tools to raise the profile of fish in broader food and nutrition security policies and investment priorities. Promote nutrition-sensitive fish food systems. Current management regimes emphasize the "maximum sustainable yield" for a given fishery. Managing for "optimal nutritional yield" would focus on not just rebuilding and conserving fish populations -- an important goal in and of itself -- but also on sustainably managing nutrient-rich fisheries. Govern distribution. Availability, access and stability are key features of food and nutrition security. Even though fish is one of the most traded food commodities in the world, there is limited information about its distribution and links to nutrition security. There is also a need to promote equitable distribution of capital and property rights to access fisheries, particularly that recognize the importance of small-scale fisheries and roles women play in fishing and aquaculture sectors. Situate fish in a food systems framework. Policymakers need the tools to conceptualize fishing and aquaculture as components of the food systems framework. A "fish as food" framing requires a better understanding of the connections among fish production and distribution, terrestrial agriculture and planetary health. Sustainable fisheries and aquaculture are key to feeding the world and alleviating malnutrition and already provide valuable nutrition and livelihood contributions. Including a nutrition lens when illustrating the multiple benefits of sustainable fisheries production can help to elevate the importance and impact of fish as a key component of the global food system and to ensure that we do not fall behind in global food security targets.

#### 2] Food insecurity empirically solves international terrorism.

Adelaja 19 [Adesoji Adelaja, Justin George, Takashi Miyahara, and Eva Penar, \* John A. Hannah Distinguished Professor in Land Policy at Michigan State University, “Food Insecurity and Terrorism,” 2019, *Applied Economic Perspectives and Policy*, Vol. 41, Issue 3, https://doi.org/10.1093/aepp/ppy021, EA]

In this study, we also found that both domestic and transnational terrorism increase (not decrease) with increased food availability. This is consistent with the findings of studies on the role of food insecurity in conflict (Bellemare 2015; Koren 2018), but we now confirm this role in the case of terrorism. The irrelevance of both the utilization (UT) and stability (ST) proxies in the presence of controls in both the models with and without instruments suggests that these dimensions do not explain either domestic or transnational terrorism. Utilization is difficult to measure at the national level and the regional, within-country variations are probably more relevant in the context of unrest. Similarly, a country which experiences extended periods of food insecurity may not necessarily be unstable with respect to its food insecurity measures. Our study reveals that the food access and availability measures are the most relevant to terrorism, at least given the specific measures we chose to evaluate food insecurity.

The direct relationships of terrorism to the unemployment rate, to rurality, to population, and to our polity variable are noteworthy. The suggestion that nations that are highly populated, but with large rural populations, are likely to be more challenged by the problem of terrorism sheds some light on where some of the future flashpoints might be. There appears to be a difference in the susceptibility of places to domestic vs. transnational attacks. The role of food insecurity in transnational attacks is not as clear as domestic attacks.

In conclusion, does food insecurity explain terrorism? The answer is a qualified yes, at least in the case of one food access indicator, the food price index. However, this study’s approach is essentially focused on intercountry associations. Further advancements can be made in exploring the causal relationship between elements of food insecurity and terrorism using subnational, micro-level data.

#### 3] Shortages don’t cause war. However, they ensure trade and globalization—turns and solves multilat

James 21 — Harold James; Professor of History and International Affairs at Princeton University. [Published: 4-20-2021; "Globalization’s Coming Golden Age"; *Foreign Affairs* “Trade Wars” May/June 2021; Accessed: 5-10-2021; [https://www.foreignaffairs.com/articles/united-states/2021-04-20/globalizations-coming-golden-age]//KL](https://www.foreignaffairs.com/articles/united-states/2021-04-20/globalizations-coming-golden-age%5d//KL)

THE FIRST TIME AROUND

The 1840s were a disaster. Crops failed, people went hungry, disease spread, and financial markets collapsed. The best-known catastrophe was the Irish potato famine, which began in 1845 and led to the deaths of nearly one million people, mostly from diseases caused by malnutrition. The same weather that made potatoes vulnerable to fungal rot also led to widespread crop failures and famine across Europe. In The Communist Manifesto, published in 1848, Karl Marx and Friedrich Engels articulated how global integration was driving the world toward social and political upheaval. “The development of Modern Industry,” they argued, “cuts from under its feet the very foundation on which the bourgeoisie produces and appropriates products.”

Europe was a tinderbox. In 1848, it ignited in an inferno of nationalist revolution, with populations rising up in France, Italy, and central Europe. But the economic shock of the 1840s did not reverse the course of global integration. Instead, trade expanded, governments reduced tariff barriers, capital mobility surged, and people moved across continents. Migration was not only a response to social and political immiseration; it also reflected the promise of new prosperity.

Historians now think of the second half of the nineteenth century as the first age of globalization. Food shortages highlighted the need for broad and diversified supply chains, and leaders realized that a modern state needed reliable access to supplies from beyond its borders. In the United Kingdom, the British government initially responded to the Irish famine by importing corn from outside Europe. At the time, The Economist argued that “except Russia, Egypt, and the United States, there are no countries in the world able to spare any quantity of grain worthy of mention.”

Historic ruptures often generate and accelerate new global links.

Imports, however, failed catastrophically. This was in part because the new food was unfamiliar, but above all, it was because London couldn’t work out how to pay for the goods. Trade deficits generated currency shortages, which pushed up interest rates in the United Kingdom and France. This intensified a manufacturing crisis—itself the result of a decline in purchasing power caused by surging food prices. Although the best solution was to sell more goods abroad, that would have required governments to lower trade barriers and open up their markets.

These shortages generated popular demands for more competent governments. Although it was only in 1981 that the economist Amartya Sen’s pioneering work on the 1943 great Bengal famine definitively showed that famines are often manmade, that intuition was already widely shared in the 1840s. John Mitchel, an Irish nationalist who emigrated to the United States, concluded, “No sack of Magdeburg, or ravage of the Palatinate, ever approached in horror and desolation to the slaughters done in Ireland by mere official red tape and stationery, and the principles of political economy.”

Governments everywhere eventually responded to these demands. That meant learning from successful efforts elsewhere. The United Kingdom enacted a series of civil service reforms, adopting a competitive examination process in place of arcane patronage. The most striking extension of state capacity, however, occurred across the English Channel, where Louis-Napoléon, the nephew of the emperor, was elected president of France in 1848. After a coup and a series of plebiscites advertising his competence and activism, Napoleon made himself president for life and, eventually, emperor—Napoleon III. His policies were designed to show the benefits of an efficient autocrat over divided liberal regimes. He initiated large-scale public works projects—including railroad expansions and Baron Haussmann’s famous rebuilding of Paris.

Napoleon also demonstrated his competence by negotiating the Anglo-French tariff agreement of 1860, which reduced duties on important goods traded across the channel. Other countries quickly followed suit and negotiated bilateral trade deals of their own across Europe. But even before 1860, improved communication and transportation meant commerce was surging: global trade in goods accounted for just 4.5 percent of output in 1846 but shot up to 8.9 percent in 1860.

The events of the 1840s also laid the foundation for a wave of institutional changes to address the proliferation of small states with a limited ability to deal with migration. The creation of new nation-states with novel currencies and banking systems, notably Germany and Italy, and administrative reform in the Habsburg empire—ending internal customs duties and serf labor—were all designed to push economic growth. In this context, the American Civil War and the Meiji Restoration in Japan were also nation-building efforts meant to maximize the effectiveness and capacity of institutions. The abolition of slavery in the United States and feudalism in Japan were profound social and economic transformations. Both upheavals, moreover, led to monetary and banking reforms.

Business competence was also newly in demand. In 1851, the United Kingdom celebrated its industrial strength with the Great Exhibition—an international fair intended to display British ingeniousness and mechanical superiority, as well as the virtues of peaceful commerce. Some of the most stunning products, however, were neither British nor particularly peaceful—among them, the steel cannon, invented by a German, Alfred Krupp, and the revolver, developed by an American, Samuel Colt. British observers saw continental Europeans catching up and overtaking their own country. To the British scientist Lyon Playfair, the exhibition showed “very clearly and distinctly that the rate of industrial advance of many European nations, even of those who were obviously in our rear, was at a greater rate than our own.” He went on: “In a long race the fastest sailing ship will win, even though they are for a time behind.” The event taught world leaders a powerful lesson: international trade was vital for enhancing national performance. Competition was central to generating competence.

The result was an abrupt psychological shift from catastrophism to optimism, and from despair to self-confidence. This new mood initiated the first wave of globalization—its so-called golden age, in which international trade and finance expanded rapidly. Eventually, however, this optimism gave way to complacency, then doubts about the benefits of globalization and increasing disillusion among those left behind (notably European farmers). The upswing came to an end with World War I. That conflict prompted a massive international rebuilding effort that faltered bloodily with the rise of fascism in the 1930s and the advent of World War II.

A SHOCK TO THE SYSTEM

The makers of the postwar settlement in 1945 had learned a great deal from the mistakes of the last century. They created an extensive framework of international institutions but left substantial economic control in the hands of national authorities. As a result, the end of World War II did not immediately unleash waves of capital mobility like those that had characterized the nineteenth century. Nearly three decades later, however, the dilemmas raised by shortages and scarcity that had led to earlier versions of integration finally returned—setting the stage for the current era of globalization.

In the 1970s, after two large oil price hikes, the industrialized world saw its way of life threatened. Oil prices had been stable in the 1960s, but a surge in demand taught producers that they could exploit control over the world’s most important commodity. Adding to the crunch, the first oil shock, in 1973–74, was accompanied by a 30 percent rise in wheat prices, after the Soviet Union experienced poor harvests and bought up U.S. grain to compensate. Shortages reappeared. Some oil-importing countries imposed “car-free days” as a way of rationing gasoline consumption. As states spent more on oil, grain, and other commodities, they found their balance of payments squeezed. Unable to afford vital goods from abroad, governments had to make hard choices. Many floundered as they tried to ration scarce goods: mandating who could drive cars when or struggling over whether they should pay nurses more than teachers, police officers, or civil servants.

The immediate and instinctual response to scarcity was protectionism. In the United Kingdom, where the balance-of-payments problem appeared earlier than elsewhere, the government tried a domestic purchasing campaign, supported by all the major political parties. Leaders encouraged citizens to wear stickers and badges with the Union Jack and the message “I’m backing Britain.” (The press magnate Robert Maxwell distributed T-shirts with a similar slogan, but they turned out to be made in Portugal.) In the mid-1970s, after the first oil shock, the government briefly flirted with what the Labour Party’s left flank called a “siege economy,” including extensive import restrictions. In the United States, there was acute anxiety about Japanese competition, and in 1981, Washington pressured Tokyo to sign an agreement that limited Japanese car exports. The move backfired, however. Because of the new restrictions, Japanese producers merely shifted their focus away from cheap, fuel-efficient cars and toward luxury vehicles.

Despite these gestures at economic nationalism, the oil shock—paradoxically at first—created more globalization. In conjunction with price increases, a financial revolution driven by the emergence of large international banks transferred huge surpluses accumulated by oil producers into lendable funds. The new availability of money made resources easily accessible for governments all over the world that wanted to push development and growth. International demand thus surged. In contrast, in the United Kingdom, Labour’s siege economy looked like it would cut off access to markets and prosperity.

Familiar historical forces will drive post-pandemic reglobalization.

Thus, crises in the 1970s led to the same realization as in the 1840s: openness produced resilience, and financing needed to be available for trade to expand. The eventual impact was obvious: trade in goods and services, which in 1970 had amounted to 12.1 percent of global GDP, increased to 18.2 percent by 1980. The cycle swung back to globalization once again.

Protectionism in the 1970s also triggered a discussion of whether governments were handling the crisis competently. At first, the debate was personalized and highly caricatured: in the United States, it centered on Richard Nixon’s crookery, Gerald Ford’s supposed inability to chew gum and walk, or Jimmy Carter’s micromanagement. In the United Kingdom, commentators focused on the detached bachelor existence of Prime Minister Edward Heath and then on allegations of cronyism against his successor, Harold Wilson. France went into the oil shock under the very sick President Georges Pompidou, who died of cancer in 1974. In West Germany, the revelation that Chancellor Willy Brandt’s closest assistant was an East German spy undermined the country’s reputation for competence. His successor, Helmut Schmidt, believed that Germany was returning to the chaos of the interwar Weimar Republic.

The many examples of personal incompetence in rich industrial democracies generated the thesis that such countries had become ungovernable. The political theorist Jean-François Revel concluded that democracies were perishing and that the Soviet Union was winning the Cold War. Autocracies such as Chile under Augusto Pinochet and Iran under Mohammad Reza Shah Pahlavi appeared better suited to handle modern global challenges. The autocrats lectured others about their superiority. In reality, however, they were bloody, corrupt, and, in many cases, spectacularly unsuccessful.

The real insight of the debate over administrative effectiveness was that governments could overstretch themselves by taking on too many tasks. That realization inspired a key tenet of what was later widely derided as “neoliberalism”: the belief that if governments took on microdecisions, such as determining wage and price levels (a central part of both Nixon’s and the British government’s bids to contain inflation), they risked their legitimacy and reputation for competence. Official decisions would appear both arbitrary and unenforceable because powerful groups would quickly make sure that new settlements favored their interests.

INFLATION NATION

The shortages of the 1840s and the 1970s both seemed to have an apparent cure: inflation. Inflation can help accommodate shocks, often painlessly. Because people have more cash or bank credit, monetary abundance generates the impression that they can have everything they want. Only gradually do consumers realize that prices are rising and that their money buys less.

In the 1850s, inflation may have been partially unintended. It was largely the result of the 1849 California Gold Rush, which vastly increased the world’s gold stock. Price increases were also driven by financial innovation, primarily Europe’s adoption of new types of banking that drove money creation, such as the so-called crédits mobiliers, which developed industrial lending in France and central Europe. By giving people apparently greater wealth, this increase in the supply of money (and the resulting mild inflation) helped governments appear more competent and made businesses and consumers more confident. It prompted a genuine global surge in production, which generated greater prosperity and security.

After 1971, when Nixon finally severed the link between the dollar and gold, monetary policy was no longer constrained by a metallic standard. In times of crisis, governments could now print more money to drive growth. In many countries, the immediate response to oil price increases was therefore to accommodate the shock through expansive fiscal and monetary stimulus: people could still go on buying. That reaction spurred inflation, which by 1974 had risen to 11 percent in the United States and beyond that in some other countries: in 1975, the United Kingdom’s inflation rate reached 24 percent.

Although inflation initially seemed to be the solution to the scarcity problem, it soon appeared in diagnoses of government incompetence. The economist Arthur Okun developed a popular “misery index” by simply adding inflation and unemployment. The metric became an important political weapon. The Democratic presidential challenger George McGovern used it against Nixon in 1972, Carter used it against Ford in 1976, and Ronald Reagan used it against Carter in 1980.

High inflation at first superficially stabilizes societies, but over time, it becomes a threat. Inflation often pushes interest groups—internationally, producer cartels such as OPEC, and domestically, labor unions—to mobilize, organize, and lobby in the hope of acquiring a greater share of monetary and fiscal resources. Depending on the extent of that mobilization, it can pull societies apart, as unions leapfrog each other with aggressive wage demands and inflation erodes the pay and pensions of the nonunionized and the retired. By demonstrating that governments are vulnerable to organized pressure, inflation is thus a destabilizing force in the long term. Indeed, analysts have argued that it was at least in part generalized international inflation in the 1960s that pushed oil producers to organize—leading to the price hikes of the 1970s.

Monetary experiments of this sort created demands for new ordering frameworks. After the surge in economic growth of the mid-nineteenth century, the world internationalized the gold standard to create a common framework for international payments. Although policymakers went a different route after the inflation and liberalization of the 1970s, they were also looking for a return to stability. To end the monetary disorder, central banks targeted a low inflation rate, and governments engaged in new patterns of cooperation abroad—creating the G-5 and then the G-7 and the G-20 as forums for discussing collective responses to global economic challenges. The quest for stability was also aided by the steady march of globalization. Greater global integration lowered production costs and thus helped correct the inflationary surge that initially accompanied the shortage economy. Inflation, which first fueled globalization in the 1850s, was, by the end of the twentieth century, eventually tamed by it.

PAST AS PROLOGUE

Today, the COVID-19 pandemic has produced a deep economic crisis, but it is different from many past ones. The shock is not a demand-driven downturn, like the Great Depression or the 2008 recession. Although lockdowns have interrupted supply and caused unemployment to soar, there is no overall shortage of demand. Large rescue and stimulus packages in rich countries have generated a financial buffer, and savings have shot up as people spend less. The best estimate is that in 2020, the United States piled up $1.6 trillion in excess savings, equivalent to seven percent of GDP. People are waiting to unleash their pent-up purchasing power. On top of that, finance ministers and international institutions are listening to U.S. Treasury Secretary Janet Yellen’s demand that “the time to go big is now” when it comes to fiscal relief.

Yet the current crisis does share key characteristics with the crises of the 1840s and the 1970s. The world of scarcity, for one thing, is already here. The pandemic has led to shortages of medical supplies such as face masks and glass vials for vaccine storage. Food prices have soared to their highest level since 2014—the result of a combination of dry weather in South America that has hurt wheat and soybean crops and pandemic-induced shipping disruptions. In the initial stages of the pandemic, laptops became scarce as employees scrambled to update their work-from-home setups. There is also a worldwide chip shortage, as the demand for microprocessors in medical, managerial, and leisure use has increased. Freight rates between China and Europe quadrupled at points in 2020. Steel, too, is in short supply.

Much as the crises in the 1840s and the 1970s did, the pandemic has also raised questions of government competence. At first, China seemed able to deal with the crisis better than its Western competitors—its cover-up of the severity of the pandemic notwithstanding—which prompted many observers to question whether democracies were capable of swift, effective action. Donald Trump’s presidency collapsed because of his chaotic handling of the crisis. British Prime Minister Boris Johnson faced a revolt among conservative members of Parliament because of his complex, contradictory, and constantly shifting lockdown rules. The European Commission lost credibility because of its poor management of vaccine purchases. As in the past, citizens personalized the incompetence. Americans debated, for example, how much blame to put on Trump’s son-in-law, Jared Kushner, who led part of the response. In the United Kingdom, much of the outrage focused on Dominic Cummings, the prime minister’s policy adviser, who had violated the country’s lockdown rules.

The challenge of the new upswing in the cycle of globalization will be to find ways to learn and adapt.

For other observers, the unifying theme behind the mismanagement was populism, with Trump, Johnson, Brazilian President Jair Bolsonaro, Indian Prime Minister Narendra Modi, and Philippine President Rodrigo Duterte all botching the response. But even in countries where the crisis has been handled relatively well, there have been surges of protests against the way governments have reacted to the pandemic. In Germany, “alternative thinkers” protesting new lockdown measures attacked the parliament building in August 2020. Even in Japan, where there is a long tradition of the use of face masks as a hygiene measure, a movement calling itself the Popular Sovereignty Party organized “cluster protests” again mask wearing.

Given these challenges, it’s easy to assume that governments and citizens alike would prioritize nationalization—cultivating supposedly resilient domestic supply chains to hedge against the next crisis. But that’s unlikely to happen. Instead, people are desperately looking for new leadership and new visions. As was true during previous supply shocks, leaders can make a good case for the importance of foreign models: some countries have done much better than others in dealing with the health and economic consequences of COVID-19. Although some of these countries are small or relatively isolated, by most metrics, the country with the most competent response was the biggest: China. That is not without irony, to put it mildly: the country responsible for unleashing the virus has also been a major beneficiary—with some states now looking to Beijing for leadership. But instead of condemning China’s response or demanding reparations for the pandemic’s costs, other countries should consider how to use Beijing’s example, just as the United Kingdom in the 1850s realized that it could learn from foreign producers.

NO SURPRISES

Familiar historical forces will drive post-pandemic reglobalization. In a world facing enormous challenges, not just the pandemic but also climate change, solutions are global public goods. In 1945, the architects of the postwar order believed that peace and prosperity were indivisible and could not be the property of one nation. Now, health and happiness are the same. Both are impossible for individual states or regions to enjoy alone.

Technology is also transforming a globalizing planet, as it did in the 1840s and the 1970s. In the mid-nineteenth century, the drivers were the steamship, the undersea cable, and the railroad. In the last quarter of the twentieth century, it was computing power: the first widely available personal computers appeared in the early 1980s. Today, data occupies the same position—linking the world and offering solutions to major problems, including government incompetence. New types of information might help leaders attack some of the inequalities and injustices highlighted by the COVID-19 pandemic. More automation might mean that machines can take on some of the repetitive and dangerous tasks performed by low-paid essential workers. Telemedicine and data-driven public health can trigger faster and more precisely targeted pharmaceutical or medical interventions.

As in past crises, there is also an immediate and powerful global demand for cheap and reliable products. In the mid-nineteenth century, it was foodstuffs, and in the 1970s, it was oil and commodities. In the 2020s, it is medical supplies, data chips, and rare-earth metals. To be resilient to new shocks, these commodities need to be produced and traded internationally, by a multiplicity of suppliers.

Governments and businesses also need to continuously innovate. As it did in the 1840s, isolationism today would mean cutting off opportunities to learn from different experiments. No single country, or its particular culture of science and innovation, was responsible for the development of an effective COVID-19 vaccine—one of the miracles of 2020. Success was the product of intense international collaboration. This story of innovation also applies to government competence. No state can succeed alone. Even if one particular decision is by chance spectacularly successful—say, Germany’s impressive testing record or the United Kingdom’s fast vaccine rollout—it is usually difficult to repeat that success in other policy areas. Policymakers may stride confidently past their first victory, only to slip on a banana peel.

The United States, in particular, may find this a hard pill to swallow. Americans have long been attached to the idea of their country’s superiority, akin to the belief held by the British in the mid-nineteenth century. COVID-19, like the 1840s famines and the 1970s oil shocks, presents both a crisis and a learning opportunity. The United States has coasted on the idea that the world needs the English language and the U.S. dollar. Neither of those assumptions can hold forever. Just as automatic translation technology is increasing linguistic accessibility, a different currency could become a new international standard. The dollar is not an adequate insurance policy or a viable basis for Washington to reject the need for change.

The challenge of the new upswing in the cycle of globalization will be to find ways to learn and adapt—increasing the effectiveness of government and business—without compromising fundamental values. As in the 1840s and the 1970s, financial and monetary innovation, or the tonic of inflation, will drive transformational change. Memories of crisis will push countries and governments to adapt in 2021 and beyond, just as they have before.

#### 4] Innovation solves everything and saves billions of lives — including resource shortages in the long run.

* Solves warming, resource shortages, and natural disasters.

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The course of human history has been shaped by many different forces, from kings and empires, to wars and treaties, to science and technology. Frequently, however, the world has been changed—or, better yet, improved—by a single idea.

Over the past 150 years alone, the invention of toilets, synthetic fertilizers, blood transfusions, and vaccines are all credited with saving more than a billion lives each1, while countless other innovations—from pasteurization to water chlorination to bifurcated needles—have saved tens of millions more. In most cases, these breakthroughs have been the result of meticulous, single-minded research to solve a specific problem, but many of the world’s most important life-saving inventions have been stumbled upon by accident, or developed for a completely different purpose than that which they would ultimately fulfill.

The laminated safety glass most commonly used in car windshields, for example, was invented when French scientist Edouard Benedictus carelessly dropped a glass flask containing cellulose nitrate, a liquid plastic that not only stopped the glass from shattering but enabled it to retain its original shape. Penicillin, meanwhile, was discovered when Scottish researcher Alexander Fleming accidentally contaminated a petri dish of bacteria he was working on, and noticed that the mold that formed prevented the bacteria culture from growing. And X-rays were a fortuitous byproduct of German physics professor Wilhelm Röntgen’s experiments with cathode ray tubes.

As science and technology have grown more sophisticated, world-changing discoveries—both deliberate and inadvertent—have become more and more frequent, with new innovations that enhance, protect or even save people’s lives appearing at astoundingly regular intervals. But just as our ability to advance or safeguard our species has grown and evolved, so too have the problems we face. For all our ingenuity, Covid-19 brought the world to a virtual standstill in the past year, highlighting the need for innovative solutions that can respond quickly to emergency situations, while the challenges posed by climate change, dwindling resources, and natural disaster events continue to loom large.

### Pandemics

#### 1] Not existential–Resilience and countermeasures prevent spread – distinct from burnout

Adalja 16

Amesh Adalja is an infectious-disease physician at the University of Pittsburgh, The Atlantic, June 17, 2016, “Why Hasn't Disease Wiped out the Human Race?”, https://www.theatlantic.com/health/archive/2016/06/infectious-diseases-extinction/487514/

But when people ask me if I’m worried about infectious diseases, they’re often not asking about the threat to human lives; they’re asking about the threat to human life. With each outbreak of a headline-grabbing emerging infectious disease comes a fear of extinction itself. The fear envisions a large proportion of humans succumbing to infection, leaving no survivors or so few that the species can’t be sustained.

I’m not afraid of this apocalyptic scenario, but I do understand the impulse. Worry about the end is a quintessentially human trait. Thankfully, so is our resilience.

For most of mankind’s history, infectious diseases were the existential threat to humanity—and for good reason. They were quite successful at killing people: The 6th century’s Plague of Justinian knocked out an estimated 17 percent of the world’s population; the 14th century Black Death decimated a third of Europe; the 1918 influenza pandemic killed 5 percent of the world; malaria is estimated to have killed half of all humans who have ever lived.

Any yet, of course, humanity continued to flourish. Our species’ recent explosion in lifespan is almost exclusively the result of the control of infectious diseases through sanitation, vaccination, and antimicrobial therapies. Only in the modern era, in which many infectious diseases have been tamed in the industrial world, do people have the luxury of death from cancer, heart disease, or stroke in the 8th decade of life. Childhoods are free from watching siblings and friends die from outbreaks of typhoid, scarlet fever, smallpox, measles, and the like.

#### 2] Spurs Cooperation---empirics prove that pandemics spur international cooperation which prevents conflict.

Payam Mohebbi 20. Professor of History at the University of Tehran. 3/17/2020. “Coronavirus, a vaccine to prevent World War III!” <https://www.tehrantimes.com/news/446238/Coronavirus-a-vaccine-to-prevent-World-War-III>. DOA: 9/4/2020. SIR.

Over the past centuries, countries have been proud of their high incomes and wealth, and have always sought to rule over other countries, a move which ultimately has led to war. It has also been considered as one of the main causes of World War I and World War II. On the other hand, epidemics that had spread in the past resulted in huge casualties due to the lack of vaccines and antibiotics and acted as controlling factors of the world’s natural population. By taking a look at the outcome of these events, one will find out that the First World War, which had been waged due to the same territorial expansions, ended with the outbreak of Spanish flu, as it inflicted financial burden and living costs on countries and made political leaders make peace. It

is noteworthy that rich countries in the past, because of their high income, used to turn to make arms and inciting the world to war. Therefore, the world’s leaders talked with each other through the power of the weapon. But, at the present time, when the world is struggling with a global pandemic (the coronavirus), instead of thinking about the former ideals, all states and leaders around the world should find a way to protect people from a hostility that is not even seen. This global pandemic has proven to the whole world that the rich and the poor are all equally vulnerable to disease and the class gap does not have anything to do with it. In fact, the possibility for a rich country to be infected is the same as a poor country, and the casualties will be the same at the end. It is true that the coronavirus has resulted in many difficulties and deaths, but, by creating the sense of sympathy and weakness, it could make us all realize that it does not matter whether we are Iranian, American, rich, poor, black or white, as we are vulnerable to the virus to the same degree.

### Ozone

#### 1] Double bind—either non-UQ or it overwhelms – I’m green

Sean **1AC** Martin 18, express reporter, “Ozone layer DECAYING as scientists fear Earth 'heading towards MASS-EXTINCTION',” https://www.express.co.uk/news/science/916405/ozone-layer-destroyed-recovering-mass-extinction-dinosaurs

News in January broke that the ozone was on its way to recovering as Earth cuts down on CO2 emissions. However, on closer inspection, scientists now say the ozone layer – the part of the atmosphere which protects us from harmful radiation – is continuing to deplete over major cities, and is only really recovering over Antarctica. Chemicals known as CFCs, which are found in aerosols for example, have been destroying the ozone layer since the 1970s. The Montreal Protocol was agreed in 1987 to phase out CFCs, but researchers say it may be too late. Study co-author Professor Joanna Haigh, co-director of the Grantham Institute for Climate Change and the Environment at Imperial College London, said of the study published in Atmospheric Chemistry and Physics: "Ozone has been seriously declining globally since the 1980s, but while the banning of CFCs is leading to a recovery at the poles, the same does not appear to be true for the lower latitudes. "The potential for harm in lower latitudes may actually be worse than at the poles. The decreases in ozone are less than we saw at the poles before the Montreal Protocol was enacted, but UV radiation is more intense in these regions and more people live there.” In a separate study, researchers have found a thinning ozone layer could have led to a mass extinction 252 million years ago – meaning a depletion of the protective layer of the atmosphere could be more catastrophic than previously thought.

2] Can’t solve CFCs and no nitrous oxide key warrant—not reverse causal

### Space War

#### 1] Plan doesn’t solve satellite targeting—they’re inevitable targets AND too many alt causes—terrestrial attacks, squo debris, ground-based lasers, ASAT, that they just can’t solve – I’m green

Laura 1AC Grego 18, Senior Scientist in the Global Security Program at the Union of Concerned Scientists, Postdoctoral Researcher at the Harvard-Smithsonian Center for Astrophysics, PhD in Experimental Physics at the California Institute of Technology, Space and Crisis Stability, Union of Concerned Scientists, 3-19-18, <https://www.law.upenn.edu/live/files/7804-grego-space-and-crisis-stabilitypdf>

Why space is a particular problem for crisis stability

For a number of reasons, space poses particular challenges in preventing a crisis from starting or from being managed well. Some of these are to do with the physical nature of space, such as the short timelines and difficulty of attribution inherent in space operations. Some are due to the way space is used, such as the entanglement of strategic and tactical missions and the prevalence of dual-use technologies. Some are due to the history of space, such the absence of a shared understanding of appropriate behaviors and consequences, and a dearth of stabilizing personal and institutional relationships. While some of these have terrestrial equivalents, taken together, they present a special challenge.

The vulnerability of satellites and first strike incentives

Satellites are inherently fragile and difficult to protect; in the language of strategic planners, space is an “offense-dominant” regime. This can lead to a number of pressures to strike first that don‘t exist for other, better-protected domains. Satellites travel on predictable orbits, and many pass repeatedly over all of the earth‘s nations. Low-earth orbiting satellites are reachable by missiles much less capable than those needed to launch satellites into orbit, as well as by directed energy which can interfere with sensors or with communications channels. Because launch mass is at a premium, satellite armor is impractical. Maneuvers on orbit need costly amounts of fuel, which has to be brought along on launch, limiting satellites‘ ability to move away from threats. **And so, these very valuable satellites are also inherently vulnerable and may present as attractive targets.**

Thus, an actor with substantial dependence on space has an incentive to strike first if hostilities look probable, to ensure these valuable assets are not lost. Even if both (or all) sides in a conflict prefer not to engage in war, this weakness may provide an incentive to approach it closely anyway.

A RAND Corporation monograph commissioned by the Air Force15 described the issue this way:

First-strike stability is a concept that Glenn Kent and David Thaler developed in 1989 to examine the structural dynamics of mutual deterrence between two or more nuclear states.16 It is similar to crisis stability, which Charles Glaser described as ―a measure of the countries‘ incentives not to preempt in a crisis, that is, not to attack first in order to beat the attack of the enemy,‖17 except that it does not delve into the psychological factors present in specific crises. Rather, first strike stability focuses on each side‘s force posture and the balance of capabilities and vulnerabilities that could make a crisis unstable should a confrontation occur.

For example, in the case of the United States, the fact that conventional weapons are so heavily dependent on vulnerable satellites may create incentives for the US to strike first terrestrially in the lead up to a confrontation, before its space-derived advantages are eroded by anti-satellite attacks.18 Indeed, any actor for which satellites or space-based weapons are an important part of its military posture, whether for support missions or on-orbit weapons, will feel “use it or lose it” pressure because of the inherent vulnerability of satellites.

Short timelines and difficulty of attribution

The compressed timelines characteristic of crises combine with these “use it or lose it” pressures to shrink timelines. This dynamic couples dangerously with the inherent difficulty of determining the causes of satellite degradation, whether malicious or from natural causes, in a timely way.

Space is a difficult environment in which to operate. Satellites orbit amidst increasing amounts of debris. A collision with a debris object the size of a marble could be catastrophic for a satellite, but objects of that size cannot be reliably tracked. So a failure due to a collision with a small piece of untracked debris may be left open to other interpretations. Satellite electronics are also subject to high levels of damaging radiation. Because of their remoteness, satellites as a rule cannot be repaired or maintained. While on-board diagnostics and space surveillance can help the user understand what went wrong, it is difficult to have a complete picture on short timescales. **Satellite failure on-orbit is a regular occurrence19** (indeed, many satellites are kept in service long past their intended lifetimes).

In the past, when fewer actors had access to satellite-disrupting technologies, satellite failures were usually ascribed to “natural” causes. But increasingly, even during times of peace operators may assume malicious intent. More to the point, in a crisis when the costs of inaction may be perceived to be costly, there is an incentive to choose the worst-case interpretation of events even if the information is incomplete or inconclusive.

Entanglement of strategic and tactical missions

During the Cold War, nuclear and conventional arms were well separated, and escalation pathways were relatively clear. While space-based assets performed critical strategic missions, including early warning of ballistic missile launch and secure communications in a crisis, there was a relatively clear sense that these targets were off limits, as attacks could undermine nuclear deterrence. In the Strategic Arms Limitation Treaty, the US and Soviet Union pledged not to interfere with each other‘s ―national technical means‖ of verifying compliance with the agreement, yet another recognition that attacking strategically important satellites could be destabilizing.20 There was also restraint in building the hardware that could hold these assets at risk.

However, where the lines between strategic satellite missions and other missions are blurred, these norms can be weakened. For example, the satellites that provide early warning of ballistic missile launch are associated with nuclear deterrent posture, but also are critical sensors for missile defenses. Strategic surveillance and missile warning satellites also support efforts to locate and destroy mobile conventional missile launchers. Interfering with an early warning sensor satellite might be intended to dissuade an adversary from using nuclear weapons first by degrading their missile defenses and thus hindering their first-strike posture. However, for a state that uses early warning satellites to enable a “hair trigger” or launch-on-attack posture, the interference with such a satellite might instead be interpreted as a precursor to a nuclear attack. It may accelerate the use of nuclear weapons rather than inhibit it.

Misperception and dual-use technologies

Some space technologies and activities can be used both for relatively benign purposes but also for hostile ones. It may be difficult for an actor to understand the intent behind the development, testing, use, and stockpiling of these technologies, and see threats where there are none. (Or miss a threat until it is too late.) This may start a cycle of action and reaction based on misperception. For example, relatively low-mass satellites can now maneuver autonomously and closely approach other satellites without their cooperation; this may be for peaceful purposes such as satellite maintenance or the building of complex space structures, or for more controversial reasons such as intelligence-gathering or anti-satellite attacks.

Ground-based lasers can be used to dazzle the sensors of an adversary‘s remote sensing satellites, and with sufficient power, they may damage those sensors. The power needed to dazzle a satellite is low, achievable with commercially available lasers coupled to a mirror which can track the satellite. Laser ranging networks use low-powered lasers to track satellites and to monitor precisely the Earth‘s shape and gravitational field, and use similar technologies. 21

Higher-powered lasers coupled with satellite-tracking optics have fewer legitimate uses. Because midcourse missile defense systems are intended to destroy long-range ballistic missile warheads, which travel at speeds and altitudes comparable to those of satellites, such defense systems also have inherent ASAT capabilities. In fact, while the technologies being developed for long-range missile defenses might not prove very effective against ballistic missiles—for example, because of the countermeasure problems associated with midcourse missile defense— they could be far more effective against satellites. This capacity is not just theoretical. In 2007, **China demonstrated a direct-ascent anti-satellite capability which could be used both in an ASAT and missile defense role, and in 2009, the United States used a ship-based missile defense interceptor to destroy a satellite, as well**. US plans indicated a projected inventory of missile defense interceptors with capability to reach all low earth orbiting satellites in the dozens in the 2020s, and in the hundreds by 2030.22

Discrimination

The consequences of interfering with a satellite may be vastly different depending on who is affected and how, and whether the satellite represents a legitimate military objective.

However, it will not always be clear who the owners and operators of a satellite are, and users of a satellite‘s services may be numerous and not public. Registration of satellites is incomplete23 and current ownership is not necessarily updated in a readily available repository. The identification of a satellite as military or civilian may be deliberately obscured. Or its value as a military asset may change over time; for example, the share of capacity of a commercial satellite used by military customers may wax and wane. A potential adversary‘s satellite may have different or additional missions that are more vital to that adversary than an outsider may perceive. An ASAT attack that creates persistent debris could result in significant collateral damage to a wide range of other actors; unlike terrestrial attacks, these consequences are not limited geographically, and could harm other users unpredictably.

In 2015, the Pentagon‘s annual wargame, or simulated conflict, involving space assets focused on a future regional conflict. The official report out24 warned that it was hard to keep the conflict contained geographically when using anti-satellite weapons:

As the wargame unfolded, a regional crisis quickly escalated, partly because of the interconnectedness of a multi-domain fight involving a capable adversary. The wargame participants emphasized the challenges in containing horizontal escalation once space control capabilities are employed to achieve limited national objectives.

Lack of shared understanding of consequences/proportionality

States have fairly similar understandings of the implications of military actions on the ground, in the air, and at sea, built over decades of experience. The United States and the Soviet Union/Russia have built some shared understanding of each other‘s strategic thinking on nuclear weapons, though this is less true for other states with nuclear weapons. But in the context of nuclear weapons, there is an arguable understanding about the crisis escalation based on the type of weapon (strategic or tactical) and the target (counterforce—against other nuclear targets, or countervalue—against civilian targets).

Because of a lack of experience in hostilities that target space-based capabilities, it is not entirely clear what the proper response to a space activity is and where the escalation thresholds or “red lines” lie. Exacerbating this is the asymmetry in space investments; not all actors will assign the same value to a given target or same escalatory nature to different weapons.

#### 3] Space debris creates existential deterrence and a taboo

Bowen 18 [(Bleddyn, lecturer in International Relations at the University of Leicester) “The Art of Space Deterrence,” European Leadership Network, February 20, 2018, <https://www.europeanleadershipnetwork.org/commentary/the-art-of-space-deterrence/>] TDI

Fourth, the ubiquity of space infrastructure and the fragility of the space environment may create a degree of existential deterrence. As space is so useful to modern economies and military forces, a large-scale disruption of space infrastructure may be so intuitively escalatory to decision-makers that there may be a natural caution against a wholesale assault on a state’s entire space capabilities because the consequences of doing so approach the mentalities of total war, or nuclear responses if a society begins tearing itself apart because of the collapse of optimised energy grids and just-in-time supply chains. In addition, the problem of space debris and the [political-legal hurdles to conducting debris clean-up](https://doi.org/10.1080/14777622.2014.890489) operations mean that even a handful of explosive events in space can render a region of Earth orbit unusable for everyone. This could caution a country like China from excessive kinetic intercept missions because its own military and economy is increasingly reliant on outer space, but perhaps not a country like North Korea which does not rely on space. The usefulness, sensitivity, and fragility of space may have some existential deterrent effect. [China’s catastrophic anti-satellite weapons test in 2007](https://defenceindepth.co/2017/01/11/chinas-space-weapons-test-ten-years-on-behemoth-pulls-the-peasants-plough/) is a valuable lesson for all on the potentially devastating effect of kinetic warfare in orbit.

## Multilat

### Space Gov

#### 1] Pelton describes the squo – yes terror and climate change but no internal link to extinction or reason why it’s irreversible – just an assertion

#### 2] No reverse causal warrant for this scenario—why does collective mining resolve current diplomatic tensions, just as likely that conflict and competition continues in space

### Terror

#### 1] The Borgwardt ev is SOLELY about Trump’s 2016 fopo -- ISIS is virtually gone and Biden solves

#### 2] Pensacola and Jersey City prove it’s just posturing