## 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

#### Violation: satellites’ use of LEO does not exclusively occupy or preclude other orbits

Johnson 20 [(Christopher, Professor of Law at the Georgetown University Law Center, Adjunct Faculty at the International Space University in Strasbourg, France, the Legal Advisor for the Moon Village Association, Core Expert and Rule Drafter in the Manual on International Law Applicable to Military Activities in Outer Space project, Juris Doctor from New York Law School and an Advanced Masters in Law in Air and Space Law from Leiden University’s International Institute of Air and Space Law) “The Legal Status of MegaLEO Constellations and Concerns About Appropriation of Large Swaths of Earth Orbit,” Handbook of Small Satellites, 2020] JL

The use of LEO by satellite constellations is substantially similar to the use of GSO, and therefore permissible. In each region, individual actors are given permission - either from a national administrator or from an international governing body (the ITU) via a national administer–to use precoordinated subsections of space. In a way that is overwhelmingly similar to the use of orbital slots in GSO, the placement of spacecraft into orbits in LEO or higher orbits does not constitute possession, ownership, or occupation of those orbits. This is because States (and their companies) have been occupying orbital slots in GSO for decades, and these uses of GSO have never been accused of “appropriating” GSO. The users have never claimed to be appropriating GSO, and their exercising of rights to use GSO is respected by other actors in the space domain. This is the same situation for other orbits, including LEO and other non-Geostationary orbits. And while GSO locations are relatively stable (subject to space weather and other perturbations, and require stationkeeping), spacecraft in LEO are actually moving through space and are not stationary, so it is even more difficult to see this use by constellations as occupation, much less appropriation. Moreover, Space Situational Awareness (SSA) and Space Traffic Management (STM) will allow other uses to use these orbits, and nothing about the use of any one user necessarily precludes others. Lastly, there is no intention by operators of constellations to exclusively occupy, must less possess or appropriate, these orbits. Would not the appropriation of outer space be an intentional, volutional act? No such intention can be found in the operators of global constellations.

#### 1AC Steer doesn’t meet – they’ve highlighted Frankenstein lines about Article II and appropriation, but the lines about military satellites are in the context of Article IV, which bans weaponization

#### Net benefits:

#### Precision – their interp justifies jettisoning any word in the rez, like private actors and outer space which zeroes neg prep

#### Limits – literally anything that takes place in space becomes topical under their interp – 2 physical entities can never occupy space at the same time – tourism, mining, constellations, rockets, skydiving, lunar bases, exploration, radio waves, photography – limits explosion precludes nuanced clash and privileges the aff by stretching pre-tournament neg prep too thin

#### Drop the debater – indicts the whole aff and deters abuse

#### Competing interps – reasonability invites arbitrary judge intervention and a race to the bottom

#### No RVIs – fairness and education are logical litmus tests and incentivizes baiting abuse to win on prepped out counterinterps

## 1NC – DA

#### JCPOA passes now – international unity and focus are key **DeYoung 2/10** [(Karen, Associate editor and senior national security correspondent for The Washington Post) **“Iran nuclear talks head toward finish line, but outcome is unclear”**, The Washington Post, 02/10/2022] **Talks between Iran and world powers over revitalizing the Iran nuclear agreement have reached their final stage and are expected to conclude one way or the other by the end of this month**, according to participants.

“I don’t know if it’s one, two or three weeks,” European Union foreign policy chief Josep Borrell said this week during a visit to Washington. But the latest round of meetings in Vienna, he said, are “certainly the last steps.”

While there is general agreement that negotiations are reaching an end state, opinions differ widely on the likely outcome.

Russia’s representative, Mikhail Ulyanov, who has adopted a generally optimistic tone since the talks started in April, said last week that negotiations should conclude “as soon as possible, preferably this month.” The talks, he said in an interview with the Russian news outlet Kommersant, had come “a long way” and were “very close to achieving” success.

A senior U.S. official, however, noted that major issues on the table remain unresolved. Negotiations are both “closer than we have been to a deal,” in that some progress has been made, and “closer than we have been to breakdown,” as time for agreement runs out, the official said. “Both outcomes are still very possible,” said the official, speaking on the condition of anonymity to comment on the sensitive diplomacy.

#### Space diplomacy directly trades off with nonproliferation agreements – finite manpower, money, and political will within the AVC

Johnson-Freeze 16 [(Joan, Professor and former Chair of National Security Affairs at the US Naval War College, Newport, Rhode Island) “Space Warfare in the 21st Century: Arming the Heavens,” Cass Military Studies, 11/8/2016] JL

 \*The plan is legislated in the AVC (same bureau of the State Department that’s concerned with the JCPOA)

Proactive policymaking takes commitment, manpower, and money. A quick look at the money and manpower devoted to diplomacy in the US State and Defense departments compared to the resources available for the hardwareproducing military–industrial complex efforts described in Chapter 5 is enlightening. The Assistant Secretary of State for Arms Control, Verification, and Compliance (AVC) leads space-related diplomacy in the State Department. The AVC Bureau is responsible for “all matters related to the implementation of certain international arms control, nonproliferation, and disarmament agreements and commitments; this includes staffing and managing treaty implementation commissions.”34 The AVC arms control portfolio includes nuclear, biological, and chemical weapons and all related issues. The AVC section charged with space issues is the Office of Emerging Security Challenges; this office also handles missile defense issues and the promotion of transparency, cooperation, and building confidence regarding cybersecurity. As of financial year 2013, AVC had a budget of $31.2 million and 141 employees35 to be active participants and leaders in all of these issues.

By way of comparison, the Space Security and Defense Program, a joint program of the DoD and the Office of the Director of National Intelligence (ODNI) was programmed for a similar budget amount in financial year 2015: $32.3 million. That program is described as a “center of excellence for options and strategies (materiel, non-materiel, cross-Title, cross-domain) leading to a more resilient and enduring National Security Space (NSS) Enterprise.”36 A majority of SSDP funding is allocated to the development of offensive space control strategies. So basically, the same budget is allocated for all US global space diplomacy efforts as for an in-house Pentagon think tank to devise counterspace strategies.

Within the Pentagon, the Deputy Assistant Secretary of Defense for Space Policy is charged with all issues related to space policy, including diplomacy. The responsibilities of the Space Policy office are to:

• Develop policy and strategy for a domain that is increasingly congested, competitive, and contested

• Implement across DoD — plans, programs, doctrine, operations — and with the IC and other agencies

• Engage with allies and other space-faring countries in establishing norms and augmenting our capabilities.37

The breadth of those responsibilities, which includes reviewing space acquisitions, means that there may be only a handful of individuals actually engaged in multilateral diplomatic efforts, acting, for example, as advisors to diplomatic discussions such as those through the United Nations. Additionally, the expanse of the Pentagon results in a chain of command that makes organizational competition for attention to subject matter challenging at best. The Deputy Assistant Secretary of Defense for Space Policy reports to the Assistant Secretary of Defense for Homeland Defense, who then reports to the Principle Deputy Secretary of Defense for Homeland Defense and Global Security, who then reports to the Under Secretary of Defense for Defense Policy. There are also a multitude of space players in other governmental organizations to coordinate and contend with, particularly within the Air Force and intelligence communities. Personnel are spread thin.

US government-wide space diplomacy needs a mandate, manpower, and a supporting budget. Diplomacy, especially multilateral diplomacy, can be timeconsuming, manpower-intensive, and frustrating; and patience is not a strong American virtue. The recent experience in the UN LTS Working Group is emblematic of everything that causes the United States to shun multilateralism. Under the auspices of this group, countries had worked in good faith over the past five years to develop technical guidelines as reciprocal constraints, as insisted upon by the developing countries when they rejected the ICOC. Yet group success appeared thwarted at the February 2016 meeting of the LTS Working Group by one country, Russia.

#### Iranian proliferation goes nuclear – causes regional war and spurs proliferation cascades across the Middle East

Chilton and Hoshovsky 20 – [(Kevin, led U.S. Strategic Command and has participated in the Jewish Institute for National Security of America’s Generals and Admirals Program; Harry, policy analyst at JINSA’s Gemunder Center for Defense and Strategy) "Avoiding a nuclear arms race in the Middle East," Defense News, 2-13-2020, <https://www.defensenews.com/opinion/commentary/2020/02/13/avoiding-a-nuclear-arms-race-in-the-middle-east/>] TDI

This raises two immediate concerns. First, **should Iran race for the bomb, it is** almost inevitable that the United States and/or Israel will take preventative military action **to stop it from crossing that fateful threshold**. This could easily spiral into a regional war as Iran activates its various proxy forces against the United States and its allies.

Second, **an Iranian nuclear breakout attempt could** spur a proliferation cascade throughout the Middle East, **beginning with Saudi Arabia.**

Mohammed bin Salman, **the Saudi crown prince, openly stated in 2018 that if Iran developed nuclear weapons**, Riyadh would quickly “follow suit.” **One suggested approach would see Saudi Arabia purchase a nuclear power reactor from a major supplier like South Korea and then build a reprocessing plant that would yield enough weapons-grade plutonium in five years**.

A half-decade delay isn’t optimal, however, when the goal is achieving nuclear deterrence quickly. Thus, there is the so-called Islamabad option.

This refers to Riyadh’s role in financing Pakistan’s nuclear weapons program and an alleged commitment from Islamabad that it would repay the favor. While Pakistani and Saudi officials have denied any such understanding, **there is the possibility that the two could work out an arrangement where Islamabad could deploy some of its nuclear arsenal on Saudi soil following a successful Iranian breakout.**

Although this maneuver would draw sharp, international criticism, in theory, it would allow Riyadh to remain in good standing vis-a-vis the nuclear nonproliferation treaty. Nevertheless, Pakistan might not be willing to play spoiler against a nuclearized Iran. If it is, Middle Eastern geopolitics would become extremely unstable.

**If Saudi Arabia acquires nuclear weapons**, many believe Turkey would follow suit. Last September, Turkish President Recep Tayyip **Erdogan declared that he “cannot accept” the argument from Western nations that Turkey should not be allowed to attain nuclear weapons.** In 1958, Charles de Gaulle proclaimed that a nation without nuclear weapons “does not command its own destiny”; two years later, France tested its first bomb. Erdogan’s comments echo those earlier remarks and raise the possibility that Ankara could become the second NATO member to leave the alliance’s nuclear umbrella in favor of its own independent arsenal.

#### Prolif cascades undermine deterrence and cause nuclear war – this is predictive of what a multi-nuclear Middle East would look like

Krepinevich 13 – [(Dr. Andrew F, the President of the Center for Strategic and Budgetary Assessments) “Critical Mass: Nuclear Proliferation in the Middle East,” 2013, <https://csbaonline.org/uploads/documents/Nuclear-Proliferation-in-the-Middle-East.pdf>] TDI

As more countries over time develop nuclear capabilities and build up their nuclear arsenals, the competition will evolve from an Israeli-Iranian affair to a multi-state rivalry. For illustrative purposes **we will assume that** in the 2025-2030 timeframe, **Iran**, **Saudi Arabia, Turkey, and perhaps Egypt** and/or Iraq **have nuclear arsenals** in the low double-digit range (i.e., ten to forty weapons). What form might a nuclear competition among these powers and Israel assume? The remainder of this chapter attempts to shed some light on this issue, and its potential implications, with emphasis on those affecting regional stability.

The challenge of preserving stability when confronted with military competition among five nuclear-armed states within the Middle East and with other powers external to the region engaged in a Great Game for influence is formidable. At first blush, one thing seems apparent: **many** Cold War-era metrics **for assessing the competition and gauging where it might be headed** appear to be of little utility; in fact, **they may actually prove misleading and dangerous**. The same can be said of those looking to apply Cold War-era arms control metrics as a way of keeping the peace in general and avoiding nuclear use in particular.

**During the Cold War, many nuclear strategists came to view nuclear parity** (the possession of roughly equivalent arsenals capable of inflicting roughly equivalent levels of destruction) **between the United States and the Soviet Union as stabilizing**. The perception of these strategists is that the rough equivalence contributed to the tradition of non-use of nuclear weapons, and was thus desirable. Parity enabled both sides to avoid the perception of being inferior to their rival, and perceptions are critical to deterrence and to preserving the confidence of one’s allies and security partners. If accepted by both sides, parity could enable them to avoid the cost and instability associated with “racing” toward ever-larger arsenals. Accordingly, maintaining parity was a major objective of U.S.-Soviet (and later U.S.-Russian) arms control negotiations. Yet irrespective of its merits, parity is not an option for states engaged in an n-player competition. Each competitor cannot have a nuclear force equivalent to all the others. Even if the competition should solidify into two coalitions so as to mimic the two-player Cold War competition, questions would almost certainly arise regarding the willingness of a coalition partner that has not been attacked to risk its own destruction by using its nuclear weapons in response to an attack on its ally. Indeed, these concerns were raised during the Cold War, and formed a major justification for France pursuing its own force de frappe. 93

**In a Middle Eastern “n-player” competition, all nuclear powers would be** challenged to establish an “assured destruction” capability **against all the other regional nuclear powers**, another Cold War desideratum, **given their relatively modest economies. An “assured destruction” capability in an n-state competition would require that each state have weapons sufficient to survive an initial attack by all potential rivals and still be able to devastate the countries of all attackers**. It would also require that the source of the attack be reliably identified. As noted earlier, this may prove difficult given likely limitations on these states’ ability to field advanced early warning systems. For example, would Israel be able to determine with confidence the owner of a ballistic missile launched from a location along the Iranian-Turkish border? The origin of any cruise missile launched from a sea-based platform? Even assuming a state could identify the source (or sources) of an attack, could its command and control systems survive the attack sufficiently intact to execute a retaliatory strike? **A decapitation strike could preclude an “assured destruction” retaliatory strike even if sufficient weapons survive to execute one.**

**This, in turn,** raises the possibility of a “catalytic” war**—one that is initiated between two states by a third party. Given a proliferated Middle East as described above, the chances that a regime would incorrectly attribute the source of an attack cannot be easily dismissed. To the extent** cyber weapons can introduce false information **into a state’s decision-making process, the risks of catalytic war only increase.**

Further complicating matters, **the early warning requirement following a proliferation cascade could be multidirectional, and at some point perhaps 360 degrees**, especially if nuclear rivals begin deploying a portion of their nuclear forces at sea. **Early warning requirements would be stressed even further** (and the costs of such a system increase correspondingly) **if a neighboring state** (e.g., Iran in the case of Turkey or Iraq; Turkey in the case of Israel; etc.) **were to acquire nuclear weapons**. In this case warning times would be even more compressed than in an Israeli-Iranian competition. Owing to its proximity to Iran, **Saudi Arabia**, for example, **could have less than five minutes to react to an Iranian ballistic missile attack no matter how advanced its early warning and command and control systems are.**

As noted earlier in this assessment, regardless of what assumptions are made regarding a regional nuclear power’s early warning system, given the short ballistic missile flight times it seems likely that preserving command and control of the state’s nuclear forces while under attack will prove challenging. **States might be tempted to adopt a launch-on-warning posture**, but this requires both early warning and a highly responsive command and control system. Should a state determine that it will not be able to launch-on-warning and instead attempt to “ride-out” a nuclear first strike and retaliate, it would still need its command and control system to function effectively in the wake of the nuclear attack. **Absent a highly resilient command and control system,** a state’s ability to launch a retaliatory **nuclear strike** may require nuclear release authority to be diffused to lower-level commanders. But again, absent an effective early warning system it may not be possible to determine the attack source with confidence in a region with multiple nuclear powers.

## 1NC – CP

#### CP: States ought to ban appropriation of outer space by private entities via military tracking satellites except for tactical intelligence, surveillance and reconnaissance” satellites made by Lockheed Martin.

#### Lockheed Martin’s making next gen space based ISR that unites the armed forces and replaces tactical surveillance platforms

Erwin ’21 [Sandra, covered the military, the Pentagon, Congress and the defense industry for nearly two decades as editor of NDIA’s National Defense Magazine and Pentagon correspondent for Real Clear Defense, “Lockheed Martin pitching mid-size satellite bus to DoD for remote sensing”, 04-13-2021, https://spacenews.com/lockheed-martin-pitching-mid-size-satellite-bus-to-dod-for-remote-sensing/]//pranav

WASHINGTON — Lockheed Martin announced a new line of satellites designed for space-based surveillance. The mid-size satellite bus is aimed at the military market and would be interoperable with military weapons systems such as fighter jets and air defense systems.

The company is pitching the new mid-size satellite as an alternative to tactical surveillance platforms like airplanes and drones. Lockheed Martin’s “tactical intelligence, surveillance and reconnaissance” satellites would give the military a capability to track moving targets from space without having to put people at risk, the company said April 13 in a news release.

A spokesman said Lockheed Martin believes the military can benefit from the lower cost of building and launching satellites, which makes space-based surveillance more affordable. For example, the Army could use satellites to locate targets and images of those targets could be downlinked to commanders on the ground. The Air Force could task satellites to track an area and pass the images directly into the cockpit of an F-35 fighter.

The company said the satellite is based on the LM400 bus — about the size of a small refrigerator — and was intentionally designed to be compliant with open standards used by DoD to connect different platforms so they can share data across land, air, maritime and space domains.

Lockheed Martin sees tactical ISR satellites as playing a central role in the Pentagon’s efforts to connect weapons systems from all military services, an initiative known as “joint all-domain command and control.”

The company said the satellites could be made with remote sensing payloads — such as visual imaging or infrared cameras, or radio-frequency trackers — supplied by DoD or by other vendors.

Rick Ambrose, executive vice president of Lockheed Martin Space, said the ISR satellites can be mass produced at the company’s Gateway Center, a new 3.5 million square-foot satellite development and manufacturing facility in Denver, Colorado.

#### Revisionist powers are reviving polar great power competition in the Arctic which upsets American unipolarity, but space strength in the region checks back

Stokes ’21 [Nathan B., Space Operations Officer United States Navy, “A COOPERATIVE SPACE STRATEGY FOR THE ARCTIC: POLICY, STRATEGY AND OPERATIONAL ASPECTS OF POLAR GREAT POWER COMPETITION”, June 2021, https://apps.dtic.mil/sti/pdfs/AD1151160.pdf]//pranav

The renewal of polar great power competition with the changing Arctic geopolitical and security environment is once again concentrating U.S. national security interests on a region traditionally viewed as an area of cooperation and low-tension. Professor AnneMarie Brady, a Chinese politics, polar politics, and foreign policy expert from the University of Canterbury in New Zealand, characterized polar great powers, in her book China as a Polar Great Power, as “states that exhibit ‘global structural power,’ or the ability to shape governance frameworks in the economic, military, and political-diplomatic sectors.”83 She goes on to state that, “to be considered a polar great power, a state must have high levels of polar scientific capacity and scientific research funding; a significant level of presence in the [Arctic]; and significant economic, military, political, and diplomatic capacity there; as well as a high level of international engagement in polar governance.”84 The emerging political and geostrategic threat to U.S. interests in the Arctic by an expanding and modernized Russian military presence and rising Chinese economic and scientific influence is seeing the Arctic region become a geostrategic flash point for future polar great power competition, where Russia, China, and the United States vie for political and geostrategic influence in a region that has the potential to alter the rules-based international order. A revisionist Russia with a resurgent Arctic presence presents a dynamic security challenge across multiple Geographic Combatant Commands (GCC) that is complex, alldomain, and multi-functional.85 The 2019 DOD Arctic Strategy notes that, “Russia views itself as a polar great power and is the largest Arctic nation by landmass, population, and military presence above the Arctic Circle.”86 The Russian Arctic coastline accounts for approximately 53 percent of the Arctic Ocean coastline, and Russia’s Arctic population of approximately two million people accounts for about half of the population living in the Arctic worldwide. Additionally, among the five Arctic littoral states of Canada, Denmark, Norway, Russia, and the United States, Russia possesses more than half of all the Arctic’s estimated oil and gas resources.87 Recent Russian military reinvestment in the region has witnessed Russian heavy bombers conducting regular air patrols along the coastlines of countries within the region, and U.S. fighter aircraft routinely intercepting Russian military aircraft inside U.S. and Canadian Air Defense Identification Zones. Advanced air and sea-launched long-range precision-strike cruise missiles are being deployed within the region allowing greater standoff ranges well outside of U.S. radar coverage. Additionally, Russia has deployed the Severodvinsk-class guided missile submarine within the region, armed with low radar cross section land-attack cruise missiles.88 These military capabilities are reinforced by Russia “refurbishing Cold War-era bases, setting up new units, opening ports and runways, and deploying radar and air-defense systems. In all, Russia has built 475 military facilities in the Arctic over the past six years [since 2019].”89 Additionally, Russia is aggressively challenging Arctic maritime security through the enforcement of aggressive economic coercion along the NSR counter to international laws. These advances in its Arctic military defense significantly increase Russia’s ability to defend and control a large stretch of the NSR and have the potential for Russia to claim an expanded EEZ that will disrupt the regional balance of power and international economic system.90

A rising China in the region is both an opportunity and challenge for the United States and its partners within the Arctic. In a January 2018 white paper titled “China’s Arctic Policy,” China declared itself a “near-Arctic state” and presented its “Polar Silk Road” economic plan to facilitate economic and social development of the Arctic. The plan emphasized China’s strategic interests within the Arctic and proposed a comprehensive strategy “to understand, protect, develop, and participate in the governance of the Arctic.”91 Although China is not an Arctic state, China was granted Arctic “observer status” within the Arctic Council in 2013.92 As an observerstate, China agreed to recognize the eight Arctic states’ sovereignty, sovereign rights, and jurisdiction in the Arctic.

However, China has also identified the Arctic as an area of “undetermined sovereignty” in which it can assert its political and economic power to influence the regional governance structure. Chinese economic, military, political, and diplomatic influence within the Arctic region provides China strategic access to transpolar shipping routes between Asia and Europe that reduce China’s dependence on southern sea routes that transit regions of U.S. influence and maritime control. China’s geostrategic priorities within the Arctic are focused on security, economic resources, and strategic science.93 In regard to space above the Arctic, Chinese space-related Arctic research focuses on research and development in the earth’s magnetic field, the aurora, all domain awareness, strategic early warning, and space situational awareness (SSA) capabilities to extend China’s operational reach.94 Space analysts have noted that China may seek to improve its SSA capabilities to better identify on-orbit targets and provide accurate engagement criteria to support space defense and counter-orbiting systems.95 China’s President Xi Jinping clarified Chinese interest in the Arctic contending that, “Polar affairs have a unique role in our marine development strategy, and the process of becoming a polar power is an important component of China’s process to become maritime great power.”96 Chinese polar interests are further illustrated in China’s vertical world map that places China at the center of the world with the polar regions dominating to the north and south. The Chinese world view sees itself visually dominating the Asia-Pacific, while sidelining the U.S., and dwarfing the importance of Europe.97 Additionally, in 2015, “the Chinese government announced that the polar regions, the deep seabed, and outer space are China’s ‘new strategic frontiers’ (zhanlüe xin jiangu), strategically important areas from which China will draw the resources needed to become a global power.”98 This increased Chinese interest in the Arctic has witnessed China investing more money in capacity than any other nation within the Arctic region,99 with significant economic investments in Canada, Denmark via Greenland, Iceland, and Norway, and significant investments in Russia’s Arctic oil and gas industry, ports, and infrastructure such as hotels.

As the global balance of power shifts from the unipolarity of U.S. dominance to a multipolar world with great power competition amongst Russia, China, and the United States, American Arctic influence is viewed to be declining as China is increasingly challenging U.S. hegemony across the globe.100 A recent poll by the European Council on Foreign Relations estimated that approximately 52 percent of Swedish respondents and 48 percent of Danish respondents thought in ten years’ time, China would be a stronger power than the United States compared to 29 and 34 percent respectively who thought the United States would maintain its advantage. Moreover, key European allies Great Britain, Germany, and France had even higher percentages of their populations that believed China would overtake the United States with 58, 56, and 62 percent compared to 19, 24, and 18 percent respectively that believed the United States would maintain its advantage.101 This eroding perception of U.S. prestige amongst key European allies and partners must be addressed by the U.S. if it seeks to maintain its regional dominance in Arctic affairs.

#### Squo space capabilities are insufficient, but new civil commercial defense programs that augment and compliment U.S. capabilities build coalition resiliency which counters Sino-Russo rise in the Arctic.

Stokes ’21 [Nathan B., Space Operations Officer United States Navy, “A COOPERATIVE SPACE STRATEGY FOR THE ARCTIC: POLICY, STRATEGY AND OPERATIONAL ASPECTS OF POLAR GREAT POWER COMPETITION”, June 2021, https://apps.dtic.mil/sti/pdfs/AD1151160.pdf]//pranav

The shared imperative and responsibility for space security within the Arctic transcends the capabilities of individual nations, due to limited budgets and competing global requirements. As the most advanced spacefaring nation within the Arctic, the United States will pay disproportionally in providing space operations and associated capabilities to provide increased communications, navigation, and awareness of the Arctic. However, assisting “allies and partners in developing, acquiring, and employing their own space capabilities that complement and augment U.S. capabilities and contribute to coalition space operations”119 can advance U.S. national security interests and build coalition resiliency in the Arctic. In line with the Obama administration’s space policy objectives, and as an evolutionary shift in strategic thinking, U.S. space policy now seeks to increase “allied and partner access to and sharing of national security-related space technologies, information, and equipment required to support cooperative activities when advantageous to U.S. national security interests.”120 This shift in strategic engagement should help build space capacity and capability and expand collective security by enhancing communication, navigation, and awareness within the Arctic if advantageous to their domestic strategic objectives. The realization of the potentiality of collective space security through shared multidomain awareness and an extended communications architecture also demands new approaches to public-private partnerships in the space domain. A 2019 intelligence community threat assessment stated, “We continue to assess that the expansion of the global space industry will further extend space-enabled capabilities and space situational awareness to government, nonstate, and commercial actors in the next several years. All actors will increasingly have access to space-derived information services, such as imagery; weather; communications; and positioning, navigation, and timing (PNT).”121 A collaborative space concept sees this as an opportunity to support and facilitate civil, commercial, defense, and multinational partners and leverage their shared resources and broader situational awareness to enhance Arctic regional security.122 In August 2020, James DeHart, the U.S. Coordinator for the Arctic, stated, “if you look at what is happening in our system over the last couple of months, you will see that we are launching a comprehensive and an integrated diplomatic approach and engagement in the Arctic region,” and that “in a few years, people will look back at this summer [of 2020] and see it as an important pivot point, a turning point, with a more sustained and enduring attention by the United States to the Arctic region.”123 However, although the current geostrategic environment has refocused U.S. attention on the Arctic due to polar great power competition, will the United States translate this to the space domain? For this to occur, the United States must turn intent into action and rhetoric into reality.

#### Arctic war causes WWIII and goes nuclear – causes extinction

Klare ’20 [Michael, The Nation’s defense correspondent, is professor emeritus of peace and world-security studies at Hampshire College and senior visiting fellow at the Arms Control Association in Washington, D.C., “A World War Could Break Out in the Arctic”, 02-11-2020, https://www.thenation.com/article/world/nato-russia-norway/]//pranav

For the soldiers participating in the exercise, the potentially thermonuclear dimensions of Cold Response 2020 may not be obvious. At its start, Marines from the United States and the United Kingdom will practice massive amphibious landings along Norway’s coastline, much as they do in similar exercises elsewhere in the world. Once ashore, however, the scenario becomes ever more distinctive. After collecting tanks and other heavy weaponry “prepositioned” in caves in Norway’s interior, the Marines will proceed toward the country’s far-northern Finnmark region to help Norwegian forces stave off Russian forces supposedly pouring across the border. From then on, the two sides will engage in—to use current Pentagon terminology—high-intensity combat operations under Arctic conditions (a type of warfare not seen on such a scale since World War II). And that’s just the beginning. Unbeknownst to most Americans, the Finnmark region of Norway and adjacent Russian territory have become one of the most likely battlegrounds for the first use of nuclear weapons in any future NATO-Russian conflict. Because Moscow has concentrated a significant part of its nuclear retaliatory capability on the Kola Peninsula, a remote stretch of land abutting northern Norway—any US-NATO success in actual combat with Russian forces near that territory would endanger a significant part of Russia’s nuclear arsenal and so might precipitate the early use of such munitions. Even a simulated victory—the predictable result of Cold Response 2020—will undoubtedly set Russia’s nuclear controllers on edge. To appreciate just how risky any NATO-Russian clash in Norway’s far north would be, consider the region’s geography and the strategic factors that have led Russia to concentrate so much military power there. And all of this, by the way, will be playing out in the context of another existential danger: climate change. The melting of the Arctic ice cap and the accelerated exploitation of Arctic resources are lending this area ever greater strategic significance. ENERGY EXTRACTION IN THE FAR NORTH Look at any map of Europe and you’ll note that Scandinavia widens as it heads southward into the most heavily populated parts of Denmark, Finland, Norway, and Sweden. As you head north, however, it narrows and becomes ever less populated. At its extreme northern reaches, only a thin band of Norway juts east to touch Russia’s Kola Peninsula. To the north, the Barents Sea, an offshoot of the Arctic Ocean, bounds them both. This remote region—approximately 800 miles from Oslo and 900 miles from Moscow—has, in recent years, become a vortex of economic and military activity. Once prized as a source of vital minerals, especially nickel, iron ore, and phosphates, this remote area is now the center of extensive oil and natural gas extraction. With temperatures rising in the Arctic twice as fast as anywhere else on the planet and sea ice retreating ever farther north every year, offshore fossil-fuel exploration has become increasingly viable. As a result, large reserves of oil and natural gas—the very fuels whose combustion is responsible for those rising temperatures—have been discovered beneath the Barents Sea and both countries are seeking to exploit those deposits. Norway has taken the lead, establishing at Hammerfest in Finnmark the world’s first plant above the Arctic Circle to export liquified natural gas. In a similar fashion, Russia has initiated efforts to exploit the mammoth Shtokman gas field in its sector of the Barents Sea, though it has yet to bring such plans to fruition. For Russia, even more significant oil and gas prospects lie further east in the Kara and Pechora Seas and on the Yamal Peninsula, a slender extension of Siberia. Its energy companies have, in fact, already begun producing oil at the Prirazlomnoye field in the Pechora Sea and the Novoportovskoye field on that peninsula (and natural gas there as well). Such fields hold great promise for Russia, which exhibits all the characteristics of a petro-state, but there’s one huge problem: The only practical way to get that output to market is via specially designed icebreaker-tankers sent through the Barents Sea past northern Norway. The exploitation of Arctic oil and gas resources and their transport to markets in Europe and Asia has become a major economic priority for Moscow as its hydrocarbon reserves below the Arctic Circle begin to dry up. Despite calls at home for greater economic diversity, President Vladimir Putin’s regime continues to insist on the centrality of hydrocarbon production to the country’s economic future. In that context, production in the Arctic has become an essential national objective, which, in turn, requires assured access to the Atlantic Ocean via the Barents Sea and Norway’s offshore waters. Think of that waterway as vital to Russia’s energy economy in the way the Strait of Hormuz, connecting the Persian Gulf to the Indian Ocean, is to the Saudis and other regional fossil-fuel producers. THE MILITARY DIMENSION No less than Russia’s giant energy firms, its navy must be able to enter the Atlantic via the Barents Sea and northern Norway. Aside from its Baltic and Black Sea ports, accessible to the Atlantic only via passageways easily obstructed by NATO, the sole Russian harbor with unfettered access to the Atlantic Ocean is at Murmansk on the Kola Peninsula. Not surprisingly then, that port is also the headquarters for Russia’s Northern Fleet—its most powerful—and the site of numerous air, infantry, missile, and radar bases along with naval shipyards and nuclear reactors. In other words, it’s among the most sensitive military regions in Russia today. Given all this, President Putin has substantially rebuilt that very fleet, which fell into disrepair after the collapse of the Soviet Union, equipping it with some of the country’s most advanced warships. In 2018, according to The Military Balance, a publication of the International Institute for Strategic Studies, it already possessed the largest number of modern cruisers and destroyers (10) of any Russian fleet, along with 22 attack submarines and numerous support vessels. Also in the Murmansk area are dozens of advanced MiG fighter planes and a wide assortment of anti-aircraft defense systems. Finally, as 2019 ended, Russian military officials indicated for the first time that they had deployed to the Arctic the Kinzhal air-launched ballistic missile, a weapon capable of hypersonic velocities (more than five times the speed of sound), again presumably to a base in the Murmansk region just 125 miles from Norway’s Finnmark, the site of the upcoming NATO exercise. More significant yet is the way Moscow has been strengthening its nuclear forces in the region. Like the United States, Russia maintains a “triad” of nuclear delivery systems, including intercontinental ballistic missiles (ICBMs), long-range “heavy” bombers, and submarine-launched ballistic missiles (SLBMs). Under the terms of the New Strategic Arms Reduction Treaty (New START), signed by the two countries in 2010, the Russians can deploy no more than 700 delivery systems capable of carrying no more than 1,550 warheads. (That pact will, however, expire in February 2021 unless the two sides agree to an extension, which appears increasingly unlikely in the age of Trump.) According to the Arms Control Association, the Russians are currently believed to be deploying the warheads they are allowed under New START on 66 heavy bombers, 286 ICBMs, and 12 submarines with 160 SLBMs. Eight of those nuclear-armed subs are, in fact, assigned to the Northern Fleet, which means about 110 missiles with as many as 500 warheads—the exact numbers remain shrouded in secrecy—are deployed in the Murmansk area. For Russian nuclear strategists, such nuclear-armed submarines are considered the most “survivable” of the country’s retaliatory systems. In the event of a nuclear exchange with the United States, the country’s heavy bombers and ICBMs could prove relatively vulnerable to pre-emptive strikes as their locations are known and can be targeted by American bombs and missiles with near-pinpoint accuracy. Those subs, however, can leave Murmansk and disappear into the wide Atlantic Ocean at the onset of any crisis and so presumably remain hidden from US spying eyes. To do so, however, requires that they pass through the Barents Sea, avoiding the NATO forces lurking nearby. For Moscow, in other words, the very possibility of deterring a US nuclear strike hinges on its ability to defend its naval stronghold in Murmansk, while maneuvering its submarines past Norway’s Finnmark region. No wonder, then, that this area has assumed enormous strategic importance for Russian military planners—and the upcoming Cold Response 2020 is sure to prove challenging to them. WASHINGTON’S ARCTIC BUILDUP During the Cold War era, Washington viewed the Arctic as a significant strategic arena and constructed a string of military bases across the region. Their main aim: to intercept Soviet bombers and missiles crossing the North Pole on their way to targets in North America. After the Soviet Union imploded in 1991, Washington abandoned many of those bases. Now, however, with the Pentagon once again identifying “great power competition” with Russia and China as the defining characteristic of the present strategic environment, many of those bases are being reoccupied and new ones established. Once again, the Arctic is being viewed as a potential site of conflict with Russia and, as a result, US forces are being readied for possible combat there. Secretary of State Mike Pompeo was the first official to explain this new strategic outlook at the Arctic Forum in Finland last May. In his address, a kind of “Pompeo Doctrine,” he indicated that the United States was shifting from benign neglect of the region to aggressive involvement and militarization. “We’re entering a new age of strategic engagement in the Arctic,” he insisted, “complete with new threats to the Arctic and its real estate, and to all of our interests in that region.” To better protect those interests against Russia’s military buildup there, “we are fortifying America’s security and diplomatic presence in the area…hosting military exercises, strengthening our force presence, rebuilding our icebreaker fleet, expanding Coast Guard funding, and creating a new senior military post for Arctic Affairs inside of our own military.” The Pentagon has been unwilling to provide many details, but a close reading of the military press suggests that this activity has been particularly focused on northern Norway and adjacent waters. To begin with, the Marine Corps has established a permanent presence in that country, the first time foreign forces have been stationed there since German troops occupied it during World War II. A detachment of about 330 Marines were initially deployed near the port of Trondheim in 2017, presumably to help guard nearby caves that contain hundreds of US tanks and combat vehicles. Two years later, a similarly sized group was then dispatched to the Troms region above the Arctic Circle and far closer to the Russian border. From the Russian perspective, even more threatening is the construction of a US radar station on the Norwegian island of Vardø about 40 miles from the Kola Peninsula. To be operated in conjunction with the Norwegian intelligence service, the focus of the facility will evidently be to snoop on those Russian missile-carrying submarines, assumedly in order to target them and take them out in the earliest stages of any conflict. That Moscow fears just such an outcome is evident from the mock attack it staged on the Vardø facility in 2018, sending 11 Su-24 supersonic bombers on a direct path toward the island. (They turned aside at the last moment.) It has also moved a surface-to-surface missile battery to a spot just 40 miles from Vardø. In addition, in August 2018, the US Navy decided to reactivate the previously decommissioned Second Fleet in the North Atlantic. “A new Second Fleet increases our strategic flexibility to respond—from the Eastern Seaboard to the Barents Sea,” said Chief of Naval Operations John Richardson at the time. As last year ended, that fleet was declared fully operational. DECIPHERING COLD RESPONSE 2020 Exercise Cold Response 2020 must be viewed in the context of all these developments. Few details about the thinking behind the upcoming war games have been made public, but it’s not hard to imagine what at least part of the scenario might be like: a US-Russian clash of some sort leading to Russian attacks aimed at seizing that radar station at Vardø and Norway’s defense headquarters at Bodø on the country’s northwestern coast. The invading troops will be slowed but not stopped by Norwegian forces (and those US Marines stationed in the area), while thousands of reinforcements from NATO bases elsewhere in Europe begin to pour in. Eventually, of course, the tide will turn and the Russians will be forced back. No matter what the official scenario is like, however, for Pentagon planners the situation will go far beyond this. Any Russian assault on critical Norwegian military facilities would presumably be preceded by intense air and missile bombardment and the forward deployment of major naval vessels. This, in turn, would prompt comparable moves by the United States and NATO, probably resulting in violent encounters and the loss of major assets on all sides. In the process, Russia’s key nuclear retaliatory forces would be at risk and quickly placed on high alert with senior officers operating in hair-trigger mode. Any misstep might then lead to what humanity has feared since August 1945: a nuclear apocalypse on Planet Earth. There is no way to know to what degree such considerations are incorporated into the classified versions of the Cold Response 2020 scenario, but it’s unlikely that they’re missing. Indeed, a 2016 version of the exercise involved the participation of three B-52 nuclear bombers from the US Strategic Air Command, indicating that the American military is keenly aware of the escalatory risks of any large-scale US-Russian encounter in the Arctic. In short, what might otherwise seem like a routine training exercise in a distant part of the world is actually part of an emerging US strategy to overpower Russia in a critical defensive zone, an approach that could easily result in nuclear war. The Russians are, of course, well aware of this and so will undoubtedly be watching Cold Response 2020 with genuine trepidation. Their fears are understandable—but we should all be concerned about a strategy that seemingly embodies such a high risk of future escalation. Ever since the Soviets acquired nuclear weapons of their own in 1949, strategists have wondered how and where an all-out nuclear war—World War III—would break out. At one time, that incendiary scenario was believed most likely to involve a clash over the divided city of Berlin or along the East-West border in Germany. After the Cold War, however, fears of such a deadly encounter evaporated and few gave much thought to such possibilities. Looking forward today, however, the prospect of a catastrophic World War III is again becoming all too imaginable and this time, it appears, an incident in the Arctic could prove the spark for Armageddon

#### Externally, monitors the climate vis-à-vis constellations

Jewett ’21 [Rachel, Managing Editor of Via Satellite, “Lockheed Martin Prepares to Launch Demo Mission With Mid-Size LM 400 Bus”, 03-05-2021, https://www.satellitetoday.com/innovation/2021/03/05/lockheed-martin-prepares-to-launch-demo-mission-with-mid-size-lm-400-bus/]//pranav

Lockheed Martin is preparing to launch a demonstration mission of the LM 400, a mid-size satellite bus that can support missions to both Low-Earth Orbit (LEO) and Geostationary Orbit (GEO). The launch contract has not yet been announced, but Lockheed Space spokesman Chris Pettigrew tells Via Satellite the mission will be launching soon, as an internal payload technology demonstration with a variety of mission areas, including Earth Observation (EO), communications, and climate monitoring.

The LM 400 is a configurable bus about the size of a refrigerator, and there are 10 variants in the LM 400 series. It is a new part of the company’s lineup of ﬂexible buses including the LM 50 for nanosatellites and the LM 2100 for larger missions. It conforms with Modular Open Systems Architecture (MOSA) and Lockheed Martin’s SmartSat software-defined satellite platform.

“The LM 400 provides an unmatched flexibility to fly any mission from LEO to GEO,” commented Rick Ambrose, executive vice president of Lockheed Martin Space. “Our investment in the LM 400 demonstrates our engineering excellence and is a result of our hybrid architecture approach to meeting customers’ evolving and dynamic

mission environments.”

It is designed for constellation architectures and operational tech insertions with high capability at a lower cost point that can support a high monthly production rate.

**Warming causes extinction & turns every impact – no adaptation & each degree is worse**

**Krosofsky ’21** [Andrew, Green Matters Journalist, “How Global Warming May Eventually Lead to Global Extinction”, Green Matters, 03-11-2021, https://www.greenmatters.com/p/will-global-warming-cause-extinction]//pranav

Eventually, yes. **Global warming will invariably result in the mass extinction of millions of different species,** humankind included. In fact, **the Center for Biological Diversity says that global warming is currently the greatest threat to life on this planet**. **Global warming causes a number of detrimental effects on the environment that many species won’t be able to handle long-term**. Extreme weather patterns are shifting climates across the globe, eliminating habitats and altering the landscape. **As a result, food and fresh water sources are being drastically reduced**. Then, of course, **there are the rising global temperatures themselves, which many species are physically unable to contend with**. Formerly frozen arctic and antarctic regions are melting, increasing sea levels and temperatures. Eventually, **these effects will create a perfect storm of extinction conditions**. The melting glaciers of the arctic and the searing, **unmanageable heat indexes being seen along the Equator are just the tip of the iceberg, so to speak.** **The species that live in these climate zones have already been affected by the changes caused by global warming.** Take polar bears for example, whose habitats and food sources have been so greatly diminished that they have been forced to range further and further south. **Increased carbon dioxide levels in the atmosphere and oceans have already led to ocean acidification**. **This has caused many species of crustaceans to either adapt or perish and has led to the mass bleaching of more than 50 percent of Australia’s Great Barrier Reef**, according to National Geographic. According to the Center for Biological Diversity, the current trajectory of global warming predicts that more than 30 percent of Earth’s plant and animal species will face extinction by 2050. By the end of the century, that number could be as high as 70 percent. We won’t try and sugarcoat things, humanity’s own prospects aren’t looking that great either. According to The Conversation, **our species has just under a decade left to get our CO₂ emissions under control. If we don’t cut those emissions by half before 2030, temperatures will rise to potentially catastrophic levels. It may only seem like a degree or so, but the worldwide ramifications are immense.** The human species is resilient. We will survive for a while longer, even if these grim global warming predictions come to pass, **but it will mean less food, less water, and increased hardship across the world — especially in low-income areas and developing countries. This increase will also mean more pandemics, devastating storms, and uncontrollable wildfires**.

## 1NC – CP

#### CP: States ought to ban appropriation of outer space by private entities via military tracking satellites in all nations except the United States. In the United States, the fifty state territories and respective state and subnational legislative bodies should ban appropriation of outer space by private entities via military tracking satellites.

#### Competes – Senate approval is normal means for treaty ratification

CRC 18 [(Convention on the Rights of the Child) “How Does the United States Ratify Treaties?” 2018]   
When the Committee on Foreign Relations sends a treaty to the full Senate, the Senate considers whether to give its "advice and consent" or approval. That requires 67 votes, or two-thirds of the 100 Senators. The Senate may make its approval conditional by including in the consent resolution amendments to the text of the treaty, its own RUDS, or other statements.

Learn more about the Senate's role in treaties here.

Back to the President

Even if the Senate votes in favor of a treaty, there is still another step in the ratification process. Only the President, acting as the chief diplomat of the United States, has the authority to ratify a treaty. With the Senate's approval, the President can then move forward with the formal process of ratification. That means submitting documents giving the US Government's agreement to abide by the treaty, as well as any RUDS, to an institution (called a "depositary"). The deposit of the instruments of ratification establishes the consent of a state to be bound by the treaty.

## 1NC – Case

### 1NC – Hacking

#### 1AC Strout concludes that private satellites are comparatively better for deterrence than current GPS – inserted in blue

WASHINGTON — The U.S. Space Force has yet to launch all of the GPS III satellites at its disposal, but work on new, more powerful versions is already underway. New GPS III Follow-on satellites — or GPS IIIF for short — will continue to improve the constellation’s accuracy and protection against jamming. GPS III satellites are already a substantial upgrade to the current constellation, providing three times greater accuracy and eight times better anti-jamming capability than their predecessors. In addition to introducing a new civil signal that is compatible with other navigation satellite systems, the five GPS III satellites on orbit completed the space component of M-code — an even more secure and accurate signal for military use. The Space Force has launched five of the planned GPS III satellites, and three more have been declared “available for launch” but are waiting in storage with prime contractor Lockheed Martin. The remaining two are undergoing testing. The Space Force has a contract with Lockheed for up to 22 GPS IIIF satellites. The service already exercised contract options for seven GPS IIIF satellites, with the most recent award taking place in October 2021, when Space Systems Command issued $737 million to the company for three more satellites. GPS IIIF satellites will be more advanced than their predecessors. Most notably, the new space systems will prove a new Regional Military Protection capability, a steerable M-code signal that can concentrate the effect in a specified region. RMP can provide up to 60 times greater anti-jamming measures, helping ensure soldiers can access critical position, navigation and timing data in contested environments. Other new features include a laser retroreflector array to increase accuracy; an upgraded nuclear detection detonation system payload; and a search and rescue payload. Starting with the third GPS IIIF space vehicle, the satellites will be built with Lockheed’s LM2100 Combat Bus, specifically designed for military use. The company claims its new bus, which will also be used for the Space Force’s next missile warning satellites, will have greater resiliency and cyber protections, more power, and better propulsion. And thanks to a new port option on the LM2100 bus, it could be possible to upgrade GPS IIIF satellites on orbit. The company’s Augmentation System Port Interface essentially works as a USB port for the satellite, allowing the Space Force to launch new payloads into space that can be plugged into the system.

#### 1AC Graff is about all satellites, not just private ones – also says Even our encrypted military GPS receivers can be spoofed – no chance they solve cyberattacks

#### Nonunique – China can already hack public sector GPS – proves it’s try or die for Lockheed deterrence

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

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

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

#### 1AC Chung is about Space Force satellites getting hacked – they don’t solve – it also happens all the time – no reason why future attacks are more likely to escalate – inserted in green

China and Russia are carrying out attacks on US satellites “every single day”, a Space Force general says. While America’s adversaries make headlines from time to time with their space activities – such as Russia blowing up one of its own satellites or China testing a new orbital hypersonic missile – General David Thompson, Space Force’s vice chief of space operations, told The Washington Post that overhead, out of the public view, there was a constant battle being waged. According to Gen Thompson, America’s adversaries are constantly conducting operations against US satellites that skirt the line between intelligence gathering and acts of war, and that the pace of the conflict is intensifying. “The threats are really growing and expanding every single day,” he said. “And it’s really an evolution of activity that’s been happening for a long time. We’re really at a point now where there’s a whole host of ways that our space systems can be threatened.” A US GPS satellite. Picture: US Space Command A US GPS satellite. Picture: US Space Command Space Force is currently dealing with “reversible attacks” – non-kinetic attacks that don’t permanently damage the satellite such as lasers, radio frequency jammers and hacking, Gen Thompson said. He would not say whether China or Russia had attacked a US military satellite in a way that did serious damage.

#### No cyber impact – their authors are hacks

Valeriano 15 [(BRANDON VALERIANO is a Senior Lecturer in Social and Political Sciences at the University of Glasgow.) Internally cites (RYAN C. MANESS is a Visiting Fellow of Security and Resilience Studies at Northeastern University in Boston, Foreign Affairs) May 13, 2015, “The Coming Cyberpeace” 5/13/2015]

The era of cyberconflict is upon us; at least, experts seem to accept that cyberattacks are the new normal. In fact, however, evidence suggests that cyberconflict is not as prevalent as many believe. Likewise, the severity of individual cyber events is not increasing, even if the frequency of overall attacks has risen. And an emerging norm against the use of severe state-based cybertactics contradicts fear-mongering news reports about a coming cyberapocalypse. The few isolated incidents of successful state-based cyberattacks do not a trend make. Rather, what we are seeing is cyberespionage and probes, not cyberwarfare. Meanwhile, the international consensus has stabilized around a number of limited acceptable uses of cybertechnology—

one that prohibits any dangerous use of force.

Despite fears of a boom in cyberwarfare, there have been no major or dangerous hacks between countries. The closest any states have come to such events occurred when Russia attacked Georgian news outlets and websites in 2008; when Russian forces shut down banking, government, and news websites in Estonia in 2007; when Iran attacked the Saudi Arabian oil firm Saudi Aramco with the Shamoon virus in 2012; and when the United States attempted to sabotage Iran’s nuclear power systems from 2007 to 2011 through the Stuxnet worm. The attack on Sony from North Korea is just the latest overhyped cyberattack to date, as the corporate giant has recovered its lost revenues from the attack and its networks are arguably more resilient as a result. Even these are more probes into vulnerabilities than full attacks. Russia’s aggressions show that Moscow is willing to use cyberwarfare for disruption and propaganda, but not to inflict injuries or lasting infrastructural damage. The Shamoon incident allowed Iran to punish Saudi Arabia for its alliance with the United States as Tehran faced increased sanctions; the attack destroyed files on Saudi Aramco’s computer network but failed to do any lasting damage. The Stuxnet incident also failed to create any lasting damage, as Tehran put more centrifuges online to compensate for virus-based losses and strengthened holes in their system. Further, these supposedly successful cases of cyberattacks are balanced by many more examples of unsuccessful ones. If the future of cyberconflict looks like today, the international community must reassess the severity of the threat.

Cyberattacks have demonstrated themselves to be more smoke than fire. This is not to suggest that incidents are on the decline, however. Distributed denial-of-service attacks and infiltrations increase by the minute—every major organization is probed constantly, but only for weaknesses or new infiltration methods for potential use in the future. Probes and pokes do not destabilize states or change trends within international politics. Even common cyber actions have little effect on levels of cooperation and conflict between states.

NORMCORE IS HERE TO STAY

A protocol of restraint has emerged as the volume of cyberattacks has increased. State-based cyberattacks are expected, and in some cases tolerated, as long as they do not rise to the level of total offensive operations—direct and malicious incidents that could destroy infrastructure or critical facilities. These options are apparently off the table for states, since they would lead to physical confrontation, collateral damage, and economic retaliation.

The reproducibility of cyberattacks has also led states to exercise restraint. Enemies can replicate successful cyberweapons easily if source code and programs find their way into the wild or are reverse-engineered. Cyberweapons are not simple to design, either, which makes their use limited: Stuxnet took years of work by U.S. intelligence (with help from Israel) and cost hundreds of millions of dollars—and it still failed. The risk of creating collateral damage is high, since cyberweaponry cannot provide surgical precision and can spread into other networks of possible allies of the attackers. For example, the Stuxnet worm, intended for Iran’s nuclear program’s network, showed up in Azerbaijan, India, Indonesia, and Pakistan, among other countries. As witnessed in the Russian attack on Georgia, the potential for conflict diffusion is high, as third-party allies can enter conflicts easily. Estonia sent its Computer Emergency Readiness Team experts to Georgia to keep the country’s crucial networks up and running. Poland freed up bandwidth for servers in its territory to keep Georgian government websites up and its people informed. Finally, the risk of retaliation is high, as it is in any war, especially as attribution of perpetrators is getting easier to trace with better forensic techniques. The only drawback is that exposing attribution capabilities often exposes ongoing infiltration methods.

All of these considerations have meant that, so far, cyberconflict has adhered to existing international conflict norms. That there have been no major operations resulting in death or the destruction of physical equipment (outside of the Saudi Aramco incident and Stuxnet) suggests trends toward stability and

safety. Cyberoperations are increasing, but only in terms of small-scale actions that have limited utility or damage potential. The truly dangerous cyberactions that many warn against have not occurred, even in situations where observers would think them most likely: within the Ukrainian conflict or during NATO’s 2011 operations in Libya. The only demonstrable cyberactivity in the Ukraine crisis has been espionage-level attacks. There is no propaganda, denial of service, or worm or virus activity, as there was in past conflicts involving Russia and post-Soviet states.

The overall trend in cyberwarfare indicates that the international community is enjoying a period of stability. The chart below demonstrates that although cybertactics are increasingly popular, the severity of these attacks remains low. On a scale of one to five, where one is a nuisance attack (a website being defaced, for example) and five is a cyber-related death, few attacks register above a two.

DRAWING COMPARISONS

Although the public may fear cyberthreats, it remains extremely trusting of the existing digital infrastructure. People trust the Internet with their connections, private contacts, banking information, personal lives, professional careers, and even romantic interests. Such confidence may be unwarranted, but resilience, not apprehension, is key to surviving in the coming era of low-level Internet-based attacks and probes.

States must be willing to make dramatic changes to their perceptions of Internet security and governance if they are to prevent cyberattacks. Most states lack functional cooperation between government and private industry for low-level cyber infiltrations, including the United States and EU countries. In addition to greater cooperation between public and private sectors, states and companies must pursue stronger cyberhygiene regimens (providing internal training to prevent potential threats) and reform the infrastructure that supports banking, electric, and health-care systems. Finally, education initiatives would help empower citizens to understand how the Web handles their transactions. Few understand how online banking, health-care databases, and utility grids work on the Internet. Education can help people—and citizens—understand the true nature of cyberthreats.

Here, we can look to the U.S. experience with terrorism: in both instances, fear is the result of imagined consequences. Terrorism has given birth to an industry built to combat threats, and a similar process is now under way with regard to cyberattacks. The general response to terrorism has been counterproductive and damaging, lending itself to hyperbole and overreaction. It is troubling to see the same path repeated with cyberwarfare, as an industry has sprung up within the private sector and military to meet the threat. The fact that there is little evidence of severe cyberattacks should give pause.

#### No impact to cyber attacks

Chuipka 17 [(Adam, Junior Policy Officer at Transport Canada (the Canadian equivalent of an Assistant Secretary at the US Dept. of Transportation) and a MA in Public and International Affairs from the University of Ottawa) “The Strategies of Cyberterrorism: Is Cyberterrorism an effective means to Achieving the Goals of Terrorists?” 1/11/2017]

These cases illustrate that the threat from cyberterrorism is real but can be vastly overstated. Most of the damage or disruption caused by the cyber-attack was quickly undone, therefore the potential threat could be considerable but the actual threat is significantly lower. While attrition has proven to be the only likely strategy that cyberterrorists could pursue, its overall effectiveness is unconvincing and counterterrorism measures could make it even less effective. First, cyberterrorism attacks are unlikely to be repeated as the vulnerabilities from that specific attack are patched up, making future threats of cyberterrorism less credible. Second, if a terrorist attempts to threaten cyberterrorism, governments can immediately search for vulnerabilities and patch them, essentially making the attack fail – this may be easier said than done in most cases though warning always provides the chance to gain an advantage. In some cases you can simply go offline since an established connection is required for cyberterrorism to ultimately work. Third, Cyberterrorism is only possible because of vulnerabilities, by hardening systems and patching vulnerabilities – the chances of cyberterrorism occurring is decreased. This is one of the ongoing efforts by governments around the world. Fourth, it is also critical that governments are constantly removing zero day vulnerabilities from the market to prevent terrorists from obtaining them – they are key in a successful surprise cyber-attack. Fifth, if worst comes to worst and a cyber-attack has proven successful, one of the most effective strategies against cyber-terrorism is simply denying that the event was caused by terrorism. Regardless of a terrorist organizations claim, if the cyber-attack is downplayed by governments as just a “glitch” in the system, it can take away the desired impact of terrorists and deter future attempts at cyberterrorism. Even if a terrorist successfully conducted a cyber-attack and claimed to be the perpetrators, cyberattacks have yet to demonstrate they can actually cause terror – an essential element for a terrorist attack to be considered a success. Given that high-level cyber-attacks capable of being violent requires vast resources, intelligence, skill, and time – ultimately too much can go wrong in conducting a cyber-attack and the costs-benefit analysis weighs heavily towards terrorist use of kinetic weapons for the time being.

**No space war – insurmountable barriers and everyone has an interest in keeping space peaceful**

**Dobos 19** [(Bohumil Doboš, scholar at the Institute of Political Studies, Faculty of Social Sciences, Charles University in Prague, Czech Republic, and a coordinator of the Geopolitical Studies Research Centre) “Geopolitics of the Outer Space, Chapter 3: Outer Space as a Military-Diplomatic Field,” Pgs. 48-49] TDI

Despite the theorized potential for the achievement of the terrestrial dominance throughout the utilization of the ultimate high ground and the ease of destruction of space-based assets by the potential space weaponry, the utilization of space weapons is with current technology and no effective means to protect them far from fulfilling this potential (Steinberg 2012, p. 255). In current global international political and technological setting, the utility of space weapons is very limited, even if we accept that the ultimate high ground presents the potential to get a decisive tangible military advantage (which is unclear). This stands among the reasons for the lack of their utilization so far. Last but not the least, it must be pointed out that the states also develop passive defense systems designed to protect the satellites on orbit or critical capabilities they provide. These further decrease the utility of space weapons. These systems include larger maneuvering capacities, launching of decoys, preparation of spare satellites that are ready for launch in case of ASAT attack on its twin on orbit, or attempts to decrease the visibility of satellites using paint or materials less visible from radars (Moltz 2014, p. 31). Finally, we must look at the main obstacles of connection of the outer space and warfare. The first set of barriers is comprised of physical obstructions. As has been presented in the previous chapter, the outer space is very challenging domain to operate in. Environmental factors still present the largest threat to any space military capabilities if compared to any man-made threats (Rendleman 2013, p. 79). A following issue that hinders military operations in the outer space is the predictability of orbital movement. If the reconnaissance satellite's orbit is known, the terrestrial actor might attempt to hide some critical capabilities-an option that is countered by new surveillance techniques (spectrometers, etc.) (Norris 2010, p. 196)-but the hide-and-seek game is on. This same principle is, however, in place for any other space asset-any nation with basic tracking capabilities may quickly detect whether the military asset or weapon is located above its territory or on the other side of the planet and thus mitigate the possible strategic impact of space weapons not aiming at mass destruction. Another possibility is to attempt to destroy the weapon in orbit. Given the level of development for the ASAT technology, it seems that they will prevail over any possible weapon system for the time to come. Next issue, directly connected to the first one, is the utilization of weak physical protection of space objects that need to be as light as possible to reach the orbit and to be able to withstand harsh conditions of the domain. This means that their protection against ASAT weapons is very limited, and, whereas some avoidance techniques are being discussed, they are of limited use in case of ASAT attack. We can thus add to the issue of predictability also the issue of easy destructibility of space weapons and other military hardware (Dolman 2005, p. 40; Anantatmula 2013, p. 137; Steinberg 2012, p. 255). Even if the high ground was effectively achieved and other nations could not attack the space assets directly, there is still a need for communication with those assets from Earth. There are also ground facilities that support and control such weapons located on the surface. Electromagnetic communication with satellites might be jammed or hacked and the ground facilities infiltrated or destroyed thus rendering the possible space weapons useless (Klein 2006, p. 105; Rendleman 2013, p. 81). This issue might be overcome by the establishment of a base controlling these assets outside the Earth-on Moon or lunar orbit, at lunar L-points, etc.-but this perspective remains, for now, unrealistic. Furthermore, no contemporary actor will risk full space weaponization in the face of possible competition and the possibility of rendering the outer space useless. No actor is dominant enough to prevent others to challenge any possible attempts to dominate the domain by military means. To quote 2016 Stratfor analysis, "(a) war in space would be devastating to all, and preventing it, rather than finding ways to fight it, will likely remain the goal" (Larnrani 20 16). This stands true unless some space actor finds a utility in disrupting the arena for others.

#### Space debris ensures deterrence

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 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 is a valuable lesson for all on the potentially devastating effect of kinetic warfare in orbit.

### 1NC – Natural Disasters

#### Zero internal link – cyberattackers would target military infrastructure , not volcano or climate monitoring satellites

#### No terminal impacts to the laundry list in 1AC Hambling – these are incomplete arguments and you should hold the line – the 1AR is too late

#### No internal link – the portion of their impact ev which says anything about extinction is about warming and species loss – it concludes we’re not doing enough to solve those even with sufficient GPS data

Wright 18 Pam Wright 1-19-2018 "Extreme Weather Events Have Greatest Likelihood of Threatening Human Existence, Experts Say" <https://weather.com/science/environment/news/2018-01-19-extreme-weather-threatens-human-existence> (M.S. in Meteorology, editor for The Weather Channel)//Elmer

Extreme weather events are the most likely threat to humanity in the next 10 years, experts say. Each year, nearly 1,000 scientists and decision-makers from around the world take a survey to identify and analyze the most pressing risks facing the planet. This year and for the second year in a row, the results of the 2018 Global Risks Report, released Wednesday at the World Economic Forms, revealed extreme weather as the most likely threat to the world over a 10-year period, topping weapons of mass destruction. These were followed by cyber attacks, data fraud or theft and failure of climate change mitigation and adaptation. “Extreme weather events were ranked again as a top global risk by likelihood and impact. Environmental risks, together with a growing vulnerability to other risks, are now seriously threatening the foundation of most of our commons," Alison Martin, group chief risk officer for the Zurich Insurance Group, said in a press release. The survey looked at five environmental risk categories this year: extreme weather events and temperatures; accelerating biodiversity loss; pollution of air, soil and water; failures of climate change mitigation and adaptation; and risks linked to the transition to low carbon. All ranked high in terms of impact and likelihood. "This follows a year characterized by high-impact hurricanes, extreme temperatures and the first rise in CO2 emissions for four years," the authors wrote in the report. "We have been pushing our planet to the brink and the damage is becoming increasingly clear." The report noted that the 2017 hurricane season, which included hurricanes Harvey, Irma and Maria, was the most expensive hurricane season on record. The authors noted that extreme rainfall "can be particularly damaging." "Of the 10 natural disasters that caused the most deaths in the first half of 2017, eight involved floods or landslides," the authors added. "Storms and other weather-related hazards are also a leading cause of displacement, with the latest data showing that 76 percent of the 31.1 million people displaced during 2016 were forced from their homes as a result of weather-related events." The report said extreme heat in California, Chile and Portugal resulted in some of the most extensive wildfires ever recorded in those areas. More than 100 deaths were attributed to wildfires in Portugal, according to the report. Extreme weather will also affect agriculture around the world, which may lead to a food crisis, the report said, adding that the Food and Agriculture Organization of the United Nations says more than 75 percent of the world’s food comes from just 12 plants and five animal species. "It is estimated that there is now a one-in-twenty chance per decade that heat, drought, and flood events will cause a simultaneous failure of maize production in the world’s two main growers, China and the United States," the authors wrote. In addition, fears of “ecological Armageddon” are "being raised by a collapse in populations of insects that are critical to food systems." In terms of the potential in having the greatest impact on humanity over the next 10 years, weapons of mass destruction ranked just above extreme weather, followed by natural disasters, failure of climate change mitigation and adaptation and water crisis. The authors noted that the use of weapons of mass destruction would have catastrophic effects but is a relatively unlikely scenario. Martin said in a World Economic Forum release that she fears the world "may squander the opportunity to move towards a more sustainable, equitable and inclusive future." "Unfortunately we currently observe a 'too-little-too-late' response by governments and organizations to key trends such as climate change," she added. "It’s not yet too late to shape a more resilient tomorrow, but we need to act with a stronger sense of urgency in order to avoid potential system collapse."

#### Resource conflict is inevitable from population and economic shifts--- scarcity creates cooperation that defuses conflict broadly

Dr. Thomas Bernauer 20, Professor of Political Science and Director of the Institute of Science, Technology and Policy (ISTP) at ETH Zurich, and Dr. Tobias Böhmelt, Professor of Government at the University of Essex, “International Conflict and Cooperation Over Freshwater Resources”, Nature Sustainability, Volume 3, https://www.nature.com/articles/s41893-020-0479-8

Unsustainable use of freshwater resources worldwide creates enormous challenges for human societies populating these natural systems, and these challenges are likely to grow with climate change. Will societies respond with increased cooperation to manage freshwater resources more sustainably or will there be more conflict over this scarce but vital resource? This review of research on conflict and cooperation over transboundary freshwater resources shows that, thus far, the prevailing response is cooperation, albeit non-violent conflict is quite frequent, too. It also documents substantial progress in understanding the drivers of water-related cooperation and conflict. Key knowledge gaps remain, particularly with respect to transboundary water conflict and cooperation in the past 10 to 15 years and in terms of local water-related events. The key prerequisite for filling these gaps is that the research community engages in a joint effort to address persistent shortcomings in existing event datasets on water cooperation and conflict.

Main

Scientific and policy debates over human impacts on global freshwater resources have been intensifying, particularly in the context of growing concerns about the implications of climate change for already stressed freshwater systems1,2,3. Climate change is likely to lead to greater variability and, in some places, an overall decrease of available freshwater, while human water use is likely to increase. The latter is driven primarily by population and economic growth as well as more consumption of goods with a high water footprint4. Projections such as these have led some scholars and policymakers to expect an increasing risk of conflicts, including violent ones, over scarce freshwater resources. Others, objecting to this Neo-Malthusian predicament, are more optimistic in view of humanity’s potential for social and technological innovation. While such expectations about the future are marked by great uncertainty, empirical research can help us understand whether and under what conditions human and climate-induced water scarcity has led to conflict or cooperative problem solving.

Human impacts on freshwater systems are well understood from a geophysical and biological perspective5,6,7,8,9,10. Much less is known about the implications of these impacts for the wellbeing of human societies relying on them. For example, controversy surrounds whether and how higher freshwater-related stress, resulting from overconsumption (water demand) or from climate-related variability and scarcity (water supply), might affect people, and how societies will respond and perform in terms of adaptive capacity and resilience. Potential effects of increased water stress on human security range from higher poverty and social instability to human migration and violent conflict within and between nations11,12,13,14.

Research on freshwater conflict and cooperation to mitigate and adapt to water problems has contributed in important ways to scientific and policy debates over the past two decades. Scholars have developed concepts and approaches to measure conflict and cooperation and to systematically assess their drivers. The most important literature in this field focuses on international freshwater catchments, on global comparisons of such catchments, and conflict and cooperation amongst riparian countries15,16,17,18,19,20. International river basins are defined by either a common water flow destination, or water flowing year-round across boundaries21. There currently are around 310 international river basins that are shared by 150 countries. They cover 47% of the world’s land surface and are home to 52% of the world’s population15. In this Review, we assess what we can learn from research on international freshwater conflict and cooperation, where our understanding remains limited, and how we can overcome existing gaps22.

Most studies on freshwater conflict and cooperation focus on individual international freshwater catchments and on policy options for dealing with the respective local challenges (for example, the Brahmaputra23, Indus24 or La Plata25 river basins). Complementing case-specific studies, we focus this Review on more general, global answers to several key questions: how prevalent are water conflict and cooperation in international freshwater catchments globally? Which catchments are more prone to water conflict or cooperation, and under what circumstances do we observe more conflict or cooperation? What conditions make catchments and their riparian countries more resilient to water-related stress and what role does international cooperation play here? Together with insights on specific freshwater catchments, answers to these questions contribute to a comprehensive assessment of anthropogenic impacts, adaptation and vulnerability with respect to global freshwater resources, and also to more informed policy choices.

Why focus on international water basins?

Freshwater-related conflict and cooperation can, in principle, be studied at any geographic, hydrological or social scale, for example, from small social groups such as a village to the water-catchment level as a hydrological unit. Climate change may be more likely to lead to local or sub-national than to international conflicts and there is an urgent need to concentrate more strongly on those as well. However, most scientific progress so far has been made on international freshwater conflict and cooperation, and we focus on this research for two additional reasons. The first reason is analytical. Generalizable conclusions about conflict and cooperation over freshwater resources should be based on a systematic comparison of a large number of clearly defined and homogeneous units, ideally for a known population. These conditions are met for countries and international freshwater catchments, all of which can be systematically identified and characterized, based on hydrological, political and other data. Such identification is more difficult for other units of analysis, such as social or ethnic groups, villages, cities and subsystems of water catchments. This also explains why the literature on freshwater conflict and cooperation at sub-national scales remains less developed (for exceptions, see refs. 18,26,27).

Second, because international freshwater catchments extend beyond national jurisdictions and their policy-making structures, effective policy responses to water stress require international collective action. In contrast to domestic water problems, which in principle can be addressed through interventions by a single government, problem-solving approaches among countries in international freshwater catchments are more complex and potentially more prone to failure15,19,20,28.

Characterizing freshwater catchments

A large literature focuses on individual cases and provides valuable insights into how water stress may lead to cooperative or conflictive outcomes, for example, via differences in how international negotiations and river management institutions are designed29,30,31,32,33,34,35,36,37. The main limitation of this research is that cooperation and conflict are empirically identified and measured differently, and explanations of particular outcomes are case-specific and based mostly on qualitative interpretation of evidence. This makes it difficult to generate generalizable conclusions about international freshwater cooperation and conflict, such as global development over time, spatial and temporal drivers, and which freshwater systems are at particular risk.

Quantitative research on conflict and cooperation in international river basins has made substantial progress over the past two decades. This applies in particular to generating better empirical data on the characteristics of international freshwater catchments and a widely accepted approach to measuring levels of cooperation and conflict. With regard to the characteristics of international freshwater catchments, based on geographic information systems and geophysical, political and other data, researchers have characterized the global landscape of international freshwater catchments. Generating this information is challenging, particularly because of technical difficulties in delineating, with high spatial resolution, the geophysical boundaries of freshwater catchments and the (sometimes time-varying) political boundaries of countries15,20,38.

One example for why increased spatial resolution is important concerns a popular hypothesis in the international water management literature. It holds that river settings with an upstream–downstream political geography are more prone to conflict. In such settings, the upstream country is likely to have an incentive to exploit its position in ways to impose damages on the downstream state (for example, reduced river flow). However, identifying where any given country in a catchment is located relative to other states is far from trivial, particularly in complex river geographies. Available data and methods now allow us to capture country and catchment boundaries with adequate precision. This also facilitates determining which countries in a catchment are more upstream or downstream, and how two or more states relate to each other in terms of freshwater dependencies15. We can thus use these measures to assess, for instance, whether upstream–downstream asymmetries between countries in freshwater catchments are, all else equal, associated with more water conflict and less cooperation.

To capture hydro-political dependence among riparian states, Beck et al.16, for example, employ a flow accumulation matrix that was created for each international river basin. They calculate the number of cells draining into a given country and determine the dependence of each riparian country on the other countries within a basin16. A flow interdependence matrix then indicates the flow contribution to each of the riparian countries. Based on these new data, they show that, contrary to conventional wisdom, there is no robust evidence for the claim that upstream–downstream catchments suffer from more water conflict than catchments with less pronounced upstream–downstream asymmetries.

Quantifying water conflict and cooperation

Generating accurate data on international freshwater conflict and cooperation is associated with a variety of challenges. In contrast to geophysical phenomena, social or political ones are usually not directly observable, but must be inferred from secondary sources. That said, most scholars now agree on what water-related cooperation and conflict means at the conceptual level, what procedures should be used to assess information from particular sources to generate numerical scores from this information, and how to structure such data for meaningful analysis14,20,39. In line with common practice in conflict research, conflict and cooperation are viewed as a social interaction that involves at least two actors. Hence, freshwater catchments with more than two countries are disaggregated into country pairs (for example, three country pairs, or dyads, in a catchment with three riparians).

Three main approaches capture conflict and/or cooperation over international freshwater catchments. First, conflict can be measured by means of widely available data on armed conflict40 and/or so-called militarized interstate disputes41. These outcomes are then combined with explanatory variables characterizing freshwater systems. Using this approach, various studies have examined whether water scarcity could, all else equal, increase the probability of armed hostilities between countries42. Second, cooperation over international freshwater resources can be operationalized via international water agreements, treaties, or joint river basin management approaches, among other variables along those lines43,44,45,46,47,48. For example, Giordano et al.47 identify 688 agreements signed between 1820 and 2007 that constitute 250 independent treaties and apply to 113 basins. Third, research coding event data for both conflict and cooperation builds on data collection approaches used in the study of international relations and conflict between countries (for example, the WEIS49 coding project or, more recently, the CAMEO50 framework and the Open Event Data Alliance51). Such coding is based on content analysis of global news media reporting, available from digital archives of translated reports, such as BBC Monitoring52 or Factiva53. Research teams have extracted large amounts of text material from these sources, using search algorithms that seek to strike a balance between capturing relevant reports and avoiding too many irrelevant items38. Human coders then identified water-related events and scored these on scales ranging from conflict to cooperation.

Studies based on the first approach, that is, those explaining armed conflict or militarized disputes in terms of water stress, have produced inconclusive findings15,16,41. Even if there is evidence for some water-related influence, other determinants of armed conflict actually play a much more important role than water stress. For example, Beck et al.16 or Bernauer and Böhmelt17 report a stronger impact of factors like income or population, which are indeed among the most robust predictors in ‘traditional’ armed-conflict

models54. This finding mirrors the literature on climate change and political violence. Besides, this literature has three limitations. First, it focuses on identifying a possible correlation (all else equal) between water stress and conflict, but cannot tell us whether conflict, if observed, was directly water-related. This raises questions about the causal influence of water stress. Second, armed conflict is an extreme, and rare, form of social interactions. Concentrating on this disregards other types of conflictive interactions that water stress may induce. In fact, the basins-at-risk (BAR) scale discussed below demonstrates that non-violent conflict events are far more prevalent than violent ones. Third, this literature does not tell us much about the flip-side of conflict, that is, the conditions under which water stress may induce cooperative efforts and motivate societies to unleash their adaptive capacities11,13,27,41. The works on transboundary water cooperation42,43,44,45,46,47 address the latter point to some extent, but many of these studies focus on binary classifications of treaty formation. However, the overall degree of cooperation and eventual success cannot be comprehensively captured by a dichotomous item on whether states concluded a treaty on a transboundary water resource or not.

The main limitations of event-data coding, which we consider the most promising approach, pertain to the quality of the text material and the human-coding process. Media reporting in richer countries with free media is more likely to pick up events of interest and report on them with accuracy. This means, for instance, that conflictive events, relative to cooperative ones, might be underreported in authoritarian political systems. While this problem is not trivial, it is usually mitigated because at least the more important events (because of scale and intensity) tend to be covered by several media sources, including those in neighbouring countries or the international press. One alternative is to scrape the Internet or use social-media data, such as data from Twitter. But such information suffers from biases, too, because governments and other actors can manipulate Internet access and post wrong or misleading information. In addition, there are no information platforms that would offer consistent information for events-data coding in one or a few languages—the latter is needed to make the task manageable for a small- to medium-size research team (there are around 6,500 spoken languages in the world).

Another challenge is that in extracting and characterizing events from media text material, humans can make mistakes (for example, overlook certain information) or subjective assessments. Agreed definitions of key concepts and detailed coding instructions, scales and procedures have helped to reduce subjectivity and error. While the obvious next step would be to use automated (computerized) coding approaches, the material from which to code freshwater conflict and cooperation is more heterogeneous than for other applications, such as central bank statements, consumer sentiment or political party programs. Moreover, machine-learning algorithms may also be biased due to the data they are trained on. In sum, while some challenges remain and the data generated on freshwater conflict and cooperation are not perfect, they are probably as good in quality as the most commonly used social-sciences data, such as economic growth, democracy, poverty and so on.

Event-data coding of transboundary water conflict and cooperation is arguably the most widely used approach and has generated numerical information on freshwater-related events between pairs of countries in a given international catchment over time38. The BAR55,56,57 scale is one of the most prominent measures here: it ranges between –7 (maximum conflict) and +7 (maximum cooperation) and captures the degree of conflict and cooperation over international freshwater catchments between 1948 and 2008. Other datasets include the International River Basin Conflict and Cooperation (IRCC) data38 and the Issue Correlates of War − River Claims dataset56. Evidently, one shortcoming of the BAR data is that the most recent year covered is 2008. While we can still learn a lot from analysing data for 50 years, including information on the more recent past remains highly desirable from a policy perspective and in the scholarly interest.

Figure 1 illustrates the distribution of cooperation and conflict events across all freshwater catchments and countries, using median values of conflict and cooperation per year from 1948–2008. Perhaps surprisingly, states’ interaction over freshwater catchments is generally, that is, on global average of all catchments and countries in a given year, characterized by more cooperation than conflict. For the majority of years from 1948–2008, the median values of the BAR scale are well above 0, indicating that cooperation was more prevalent than conflict. From a policy perspective, it is interesting to pinpoint those catchments that experience most conflict or cooperation: hence, disaggregating the BAR scale by catchment.

The graph depicts three median splines across the BAR scale’s observation period for all possible BAR values, only cooperative (positive) ones, and only conflictive (negative) ones. The graph is based on data from www.transboundarywaters.science.oregonstate.edu.

Understanding the spatial and temporal distribution of international freshwater conflict and cooperation, in a descriptive sense, is important in its own right. However, it is also imperative to understand the drivers of variation in conflict and cooperation. Why do some catchments and/or pairs of countries in those catchments experience more conflict? Why is cooperation more prevalent in other cases?

Predictors of water cooperation and conflict

Accurate characterizations of international freshwater catchments and precise data on water conflict and cooperation are a precondition for meaningful analysis of drivers of water conflict and cooperation. Such analysis views conflict and cooperation as the outcomes to be explained and focuses both on conflict and cooperation at varying levels of intensity (for example, from conflictual verbal exchanges to violent conflict over water). Such research is obviously also of interest to practitioners because they are interested in which particular factors induce conflict or cooperation to identify risks and opportunities for cooperative solutions. Studies of factors associated with, or that cause variation in, the outcome variable (for example, the outbreak of armed conflict, the emergence of a water treaty, or values on the BAR scale) are based on a range of statistics, from correlational analysis to estimating the predictive power of specific determinants. In the following, we discuss the most common and robust predictors of transboundary water conflict and cooperation55,58,59.

#### No impact to extreme weather events

Jeff Kueter, President, “The Climate of Insecurity,” POLICY OUTLOOK, George C. Marshall Institute, 3—14, http://marshall.org/wp-content/uploads/2014/03/Climate-Security-Mar-14.pdf, accessed 4-28-14.

No, actual weapons are designed with the deliberate intent to kill people. Nuclear weapons used in World War II are estimated to have killed hundreds of thousands of people. The weapons available to any nuclear power today dwarf the World War II bombs in destructive power and even the crudest device can cause enormous physical damage. Use of chemical or biological weapons of mass destruction likely pose fewer fatalities than nuclear weapons, but with equally unthinkable consequences. Deaths associated with climate change-­‐induced storms or other “extreme weather” events first have to be distinguished from naturally occurring weather-­‐related events, droughts, famines, etc. Even if one could distinguish naturally occurring storms and “extreme weather” events (floods, tornadoes, etc.) from those that are “intensified” by anthropogenic global warming, the fatalities involved with such storms are very small when compared to the destructive power of nuclear weapons. According to NOAA, 103 people died in the United States in 2012 as a result of tornadoes, floods, and hurricanes.6 There are extremes, of course; 553 people perished from tornadoes in 2011 and 1,016 from hurricanes in 2005. Death is a tragedy and I won’t belittle these losses, but the difference in scale is obvious. One analysis of global mortality trends put the question even more starkly: “Thus, while extreme weather-­‐related events garnish plenty of attention worldwide because of their episodic and telegenic nature, their contribution to the global mortality burden is relatively minor: 0.03 percent of global deaths.”7

#### Supervolcanoes won’t erupt and won’t cause extinction

Natalie Wolchover, Staff Writer | June 02, 2012 11:42am ET “What If the Yellowstone Supervolcano Erupts?” http://www.livescience.com/20714-yellowstone-supervolcano-eruption.html

A rough estimate based on geologic records indicates there's a 1-in-10,000 chance of a "supereruption" at Yellowstone during our lifetimes. However, given the erratic nature of volcanoes, that number doesn't mean much. The bulging pocket of magma swishing around beneath Old Faithful might never blow its lid again. Or, it might put on a surprise fireworks show next Independence Day. Scientists just don't know.¶ But if or when it blows, what will actually happen? Will it be the end of us all, or just a big knock to the tourism industry in Wyoming?¶ Each of the three past supereruptions of the Yellowstone hotspot spewed more than 1,000 cubic kilometers of magma into the environment — the benchmark of a "supervolcano." According to Jacob Lowenstern, scientist-in-charge at the Yellowstone Volcano Observatory, that's a large enough eruption to cover much of North America in an ash blanket of varying thickness.¶ "The ash is thick (more than about 30 centimeters of ash) near the eruption source and a small fraction of a millimeter once you move 2,000 miles away. It's fair to say that a trace of ash would be found over most of the United States, though it would only be thick enough to collapse roofs in the states closest to Yellowstone," Lowenstern told Life's Little Mysteries.¶ With enough warning, the states near Yellowstone could be evacuated, which would largely avoid a tremendous loss of life caused by the downpour of ash, the scientists said. But that's just in the short term; the aftermath would be the rub. For several days, ash would hang in the air, making it difficult to breathe. And that blanket of ash covering the country would smother vegetation and pollute the water supply, quickly leading to a nationwide food crisis. "A lot of people would perish," said Stephen Self, director of the Volcano Dynamics Group at the Open University in the U.K. He envisions American refugees lining up at the Mexican border. [5 Ways the World will Radically Change This Century]¶ Perhaps foreign governments would come to our aid and embark on a major ash cleanup operation, but without such an effort, inhospitable conditions would persist in the midwestern U.S. for about a decade. "The records show that [new] vegetation starts to take hold about 10 years after supereruptions. It depends on how much rainfall the area receives, as rainfall is the main way you clear ash off the land," Self said.¶ As for the rest of the world, it would face a few years of mild climate change caused by the supereruption's ash cloud, which would wrap around the globe, casting Earth in shadow for several days and altering the chemical composition of the atmosphere for a decade or so. However, recent research shows the global impacts of supervolcanoes are less severe than scientists once thought, and a Yellowstone supereruption might be especially unimposing because its magma contains minimal sulfur. Sulfur gas produces particles called aerosols, which can cool the climate by blocking sunlight.¶ "The huge volume of magma means there would still be some sulfur injected into the atmosphere, but work has shown that you reach a sort of limit in the amount of aerosols you can produce with sulfur gas. It means that our earlier suggestions that there would be a severe temperature change is not right," Self said. [What If Earth's Magnetic Poles Flip?]¶ Based on the new models, the scientists now think the vast majority of Earth's species would weather a Yellowstone supereruption just fine (