# 1NC

## Case

### Adv 1

#### Neg on presumption and reject 1AR pivots – PTD is prohibitively vague.

Pop 08 “Who Owns the Moon?: Extraterrestrial Aspects of Land and Mineral Resources Ownership” Virgiliu Pop [Romanian space lawyer and author] 2008 <https://books.google.com/books?id=0Q85MpsFtEgC> SM

James P. Power (1995, pp. 419–420) defines the Public Trust Doctrine as a legal concept representing the interest or rights of the public in natural resources; he remarks nevertheless the lack of agreement regarding the nature, purview, applications or immutability of that interest. Indeed, as Paul M. Bray (1999) notes, the Public Trust paradigm is an “historical and currently evolving concept relating to the ownership, protection and use of essential natural and cultural resources”

#### Can’t solve resource disputes – their solvency advocate still allows claims by public and private entities, they just need to be in the name of the public good – if 2 companies make the same claim to a resource the aff cannot resolve that dispute because it cannot grant property rights

#### Their ev says so

ACBabcock 19 [Hope M. Babcock, Professor Babcock served as general counsel to the National Audubon Society from 1987-91 and as deputy general counsel and Director of Audubon’s Public Lands and Water Program from 1981-87. Previously, she was a partner with Blum, Nash & Railsback, where she focused on energy and environmental issues, and an associate at LeBoeuf, Lamb, Leiby & MacRae where she represented utilities in the nuclear licensing process. From 1977-79, she served as a Deputy Assistant Secretary of Energy and Minerals in the U.S. Department of the Interior. Professor Babcock has taught environmental and natural resources law as a visiting professor at Pace University Law School and as an adjunct at the University of Pennsylvania, Yale, Catholic University, and Antioch law schools. Professor Babcock was a member of the Standing Committee on Environmental Law of the American Bar Association, and served on the Clinton-Gore Transition Team, 2019, Syracuse Law Review, https://scholarship.law.georgetown.edu/facpub/2201] simha

It avoids the problems of alienation and exclusion associated with any of the management approaches associated with some form of private property and requires neither the creation of a new administrative authority nor the presence of a close-knit group of like-minded people

#### The plan also can’t resolve conflicting claims by nations, which is the internal link to the Skibba and Myers ev – if it can the aff is blatantly extra T and restricts public appropriation

#### Mining is unsustainable – the bubble bursts

Gardenyes 2017 (Distri Josep Gardenyes, Marxist and anarchist writer, "New Technologies, Extraterrestrial Exploitation, And The Future Of Capitalism", It's Going Down, January 28 2017, <https://itsgoingdown.org/new-technologies-extraterrestrial-exploitation-future-capitalism/>, mmv)

2017 is the year of Google’s Lunar X Prize, through which the North American corporation (as important to 21st century capitalism as Ford was to 20th century capitalism) is offering $20 million to the first company that manages to send a landing craft to the moon, drive 500 meters, and transmit high-resolution images back to Earth. But they have to do it this year. And there are already various teams that are getting ready to meet the challenge. One of which is Moon Express, which has already become the first company in history to receive legal permission, from the US government in this case, to carry out commercial exploitations on the moon’s surface. If this team makes it to the moon—and they already have the necessary financing and a schedule of test launches—they won’t only win the Prize, they will also drop off a commercial payload that represents the first step in setting up an equipment delivery service to the moon, which will make the lunar mining of Helium-3 (a valuable fuel for nuclear reactors) feasible. Another company, Planetary Resources, claims that the mining of metals and water on asteroids could be a trillion dollar business. For them, water (and the hydrogen it contains, which could be used as spaceship fuel) is “the oil of space.” These are not empty words. Planetary Resources is another company that has a business plan and the technology needed to begin carrying out the mining it envisions. On the 14th of January, Space X returned to space. It’s one of the companies of Elon Musk (who is also preparing self-driving cars for commercial sale; the technology already works and the only obstacle are the legal regulations), the billionaire whose personal crusade is the colonization of Mars in the next two decades. Space X fixed a design flaw in its rockets and on the 14th made an effective launch, deploying 10 commercial satellites from the same rocket, which, subsequently, returned automatically to Earth, landing on a Space X drone ship waiting—with its entirely robotic crew—in the Pacific Ocean. The autonomous and reusable rockets (one could say, environmentally friendly) are one of the foundations of Musk’s plan for reaching Mars in a commercially feasible way. He has already developed a business plan for developing the technology and acquiring the resources needed to complete the mission. These are not isolated or insignificant companies. And the State is also paying attention to extraterrestrial colonization. The UN Treaty on Outer Space, from 1966, holds that space and space objects cannot be armed or claimed as territory, and that any economic activity had to be peaceful and for the good of all humanity. In 2015, in the Commercial Space Launch Competitiveness Act, the US government clarified the legal question, establishing the legal right of private companies to exploit the moon, asteroids, and other space objects. It gives private entities the right to own and sell resources extracted from space objects, but not to possess the object outright. In effect, they can mine the moon until it’s empty, but the private companies working there with their robotic factories couldn’t be considered the owners. The dotcom boom, which burst in 2000, shows that immense amounts of capital can be invested in companies that do not generate any profits for quite a few years before provoking a crash (in this case, it was six years). In fact, the crash didn’t come until the moment when a few new corporations showed the capacity to become profitable and productive, corporations that today are among the most powerful in the world, like Google, Amazon, and Facebook. We are at the beginning of a phase of massive investment and growth in the new sector of extraterrestrial transport and minin

g. The venture capitalists of this sector enjoy the advantage that the logistical foundation of their dream (everything connected with the launching of satellites, with their crucial military and commercial uses) is already in place and profitable. Similarly, Columbus didn’t have to invent the long-distance ships or the navigation equipment (which had already been developed by the Portuguese in the luxurious commercial circuits of the Indian Ocean), he just had to take them further. They still have a few years to yield profits with extraterrestrial extraction before the bubble bursts. If they achieve it, capitalism will once again undergo an intense growth and the moment of maximum vulnerability and maximum popular rage that the institutions now face will have passed. Extraterrestrial colonization is no longer a trope of science fiction. But speaking of science fiction, we must also point out the great imaginary production carried out by Hollywood and other centers of cultural work, which have redirected our gaze to the colonization of space. Since the 19th century, there have been occasional works that posed journeys beyond Planet Earth, but the current frenetic production is qualitatively and quantitatively incomparable. Its effect is not only the normalization of extraterrestrial activity, it also accustoms us to imagine the first steps of taking our civilization and the capitalist economy beyond the Earth’s gravity well.

#### Asteroid mining causes satellite-dust collisions – creates debris

Scoles 15 [(Sarah Scoles, freelance science writer, contributor at Wired and Popular Science, author of the books Making Contact and They Are Already Here) “Dust from asteroid mining spells danger for satellites,” New Scientist, May 27, 2015, <https://www.newscientist.com/article/mg22630235-100-dust-from-asteroid-mining-spells-danger-for-satellites/>] TDI

* Study this is citing – Javier Roa, Space Dynamic Group, Applied Physics Department, Technical University of Madrid. Casey J Handmer, Theoretical Astrophysics, California Institute of Technology. Both PhD Candidates. “Quantifying hazards: asteroid disruption in lunar distant retrograde orbits,” arXiv, Cornell University, May 14, 2015, <https://arxiv.org/pdf/1505.03800.pdf>

NASA chose the second option for its [Asteroid Redirect Mission](http://www.nasa.gov/content/what-is-nasa-s-asteroid-redirect-mission/), which aims to [pluck a boulder from an asteroid’s surface](https://www.newscientist.com/article/dn27243-rock-grab-from-asteroid-will-aid-human-mission-to-mars) and relocate it to a stable orbit around the moon. But an asteroid’s gravity is so weak that it’s not hard for surface particles to escape into space. Now a new model warns that debris shed by such transplanted rocks could intrude where many defence and communication satellites live – in geosynchronous orbit.

According to [Casey Handmer](http://www.caseyhandmer.com/) of the California Institute of Technology in Pasadena and Javier Roa of the Technical University of Madrid in Spain, 5 per cent of the escaped debris will end up in regions traversed by satellites. Over 10 years, it would cross geosynchronous orbit 63 times on average. A satellite in the wrong spot at the wrong time will suffer a damaging high-speed collision with that dust.

The study also looks at the “catastrophic disruption” of an asteroid 5 metres across or bigger. Its total break-up into a pile of rubble would increase the risk to satellites by more than 30 per cent ([arxiv.org/abs/1505.03800](http://arxiv.org/abs/1505.03800)).

#### Debris increase causes premium spikes

Dr. Darren **McKnight 10**, received his Bachelor’s Degree from the United States Air Force Academy in Engineering Sciences, his Master’s Degree from the University of New Mexico in Mechanical Engineering, and his Doctorate from the University of Colorado in Aerospace Engineering Sciences, “Pay Me Now or Pay Me More Later: Start the Development of Active Orbital Debris Removal Now,” https://www.amostech.com/TechnicalPapers/2010/Posters/McKnight.pdf

Nominally, the bulk of the 10-15% average premium for a space mission covers the launch vehicle flight and the initial (first year) satellite operations while only a small portion of the total premium (i.e. about 1.5% of the satellite value per year) is for on-orbit operations after startup. [15] When the collision risk reaches a value of 1.5% per year, insurance **premiums will** likely **increase**. However, once a collision with an insured satellite occurs, the urgency for starting active debris removal options will also likely accelerate. While the probability of a single spacecraft being destroyed, or even just rendered non-operational, by a collision with a large trackable piece of debris is small, the probability that any large object will collide with another is quite a bit higher. The probability of collision for a specific satellite is proportional to the number of objects posing a collision hazard with it while the collision rate between objects is a function of the square of the number of objects present, assuming that the ratio of the large fragments to intact spacecraft is constant with time. [7] In this way, while a hypothetical 20% increase in the population would only produce a 20% increase in collision probability for a single large object, the probability that any two large objects colliding goes up by over 40%. This collision rate is only an approximation since as collisions occur between large objects the ratio of large fragments to intact spacecraft will change. However, early in this process (i.e. for several decades) this approximation introduces very little error. Eventually, this increased collision rate will result in a series of collisions between large objects and the total debris population will start to **increase rapidly**. In fact, before the 2007 Chinese ASAT event, the average annual increase to the cataloged population was around 250 objects per year. The Chinese test contributed over 2,700 trackable objects (while more than 3,000 have actually been identified) so, this single event contributed over ten years’ worth of population number growth. While this event was a purposeful collision, rather than accidental, the debris creation issue is still relevant. The accidental collision in February 2009 of the operational Iridium and defunct Russian communications satellites created more than 1,600 trackable objects (while over 2,000 objects have been identified), which is still over six years of “typical” growth. With a single event producing many years of “typical” **debris accumulation**, it is easy to see how quickly previous predictions of collision rates will have to be updated with new population levels. Work done in the 1970s by Don Kessler and Burton Cour-Palais hinted at the situation that is now becoming a reality: collisions between trackable objects are occurring with sufficient frequency such that these events are the main driver for future debris growth across all size ranges. [7] This is simple to understand since two colliding large trackable objects will create hundreds of trackable objects plus tens of thousands of lethal projectiles and so act as an accelerant to the growth of lethal (>1cm) debris fragments.

#### Turns the commercial sector and makes mining impossible

Pamela L. **Meredith 08**. Co-chair of the Zuckert Scoutt & Rasenberger, L.L.P., Space Law Practice Group and an adjunct professor of space law at American University's Washington College of Law. 2008. “Space Insurance Law-with a Special Focus on Satellite Launch and In-Orbit Policies.” The Air & Space Lawyer. Volume 21, No.4. pp 13-15. https://www.kmazuckert.com/publications/space/Commerical\_Space\_-\_Meredith\_-\_Space\_Insurance\_Law\_2008.pdf

Conclusion From the beginning of space insurance in 1965 until today, insurance has played a **critical role** in the development and sustained growth of the commercial satellite industry in the United States and **the world at large**. As with other high-risk enterprises involving high-value assets, financing for satellite ventures **may not have been possible** or **forthcoming** were it not for the **availability of finance**. **Insurance is a key condition in bond covenants** for satellite companies and in satellite asset-based transactions. Insurance provides the satellite owner and its financiers with the **peace of mind** that if the launch or satellite fails, the asset value is **protected** as provided in the insurance policy.

#### Collisions with early warning satellites causes miscalc and goes nuclear – magnified by the Kessler effect

Blatt 20 [Talia, joint concentration in Social Studies and Integrative Biology at Harvard, specialization in East Asian geopolitics and security issues] “Anti-Satellite Weapons and the Emerging Space Arms Race,” Harvard International Review, May 26, 2020, <https://hir.harvard.edu/anti-satellite-weapons-and-the-emerging-space-arms-race/> TG

Despite their deterrent functions, ASATs are more likely to provoke or exacerbate conflicts than dampen them, especially given the risk they [pose](https://thebulletin.org/2019/06/arms-control-in-outer-space-the-russian-angle-and-a-possible-way-forward/) to early warning satellites. These satellites are a crucial element of US ballistic missile defense, capable of [detecting missiles](https://www.globalsecurity.org/space/world/japan/warning.htm) immediately after launch and tracking their paths.

Suppose a US early warning satellite goes dark, or is shut down. Going dark could signal a glitch, but in a world in which other countries have ASATs, it could also signal the beginning of an attack. Without early warning satellites, the United States is much more susceptible to nuclear missiles. Given the strategy of counterforcing—[targeting](https://www.belfercenter.org/sites/default/files/files/publication/isec_a_00273_LieberPress.pdf) nuclear silos rather than populous cities to prevent a nuclear counterattack—the Americans might believe their nuclear weapons are imminently at risk. It could be [twelve hours](https://books.google.com/books?id=ET8lDwAAQBAJ&pg=PA1&lpg=PA1&dq=%22Protecting+Space+Assets%22+johnson-freese&source=bl&ots=6Oq0IdeBjw&sig=ACfU3U1G6Hj8QdP4JlCRNxA6i5XplZwHyg&hl=en&sa=X&ved=2ahUKEwj1n-jT2YzpAhUugnIEHUuMCu4Q6AEwA3oECAkQAQ#v=onepage&q=%22Protecting%20Space%20Assets%22%20johnson-freese&f=false) before the United States regains satellite function, which is too long to wait to put together a nuclear counterattack. The United States, therefore, might move to mobilize a nuclear attack against Russia or China over what might just be a piece of debris shutting off a satellite.

Additionally, accidental warfare, or strategic miscalculation, is uniquely likely in space. It is [much easier](https://books.google.com/books?id=VyXTDwAAQBAJ&pg=PA339&lpg=PA339&dq=space+offense+dominant&source=bl&ots=Mw0bgJ51qf&sig=ACfU3U3DeZiEHpr9nfszlCbJZIoyyssIpg&hl=en&sa=X&ved=2ahUKEwjrs-WD3IzpAhVulHIEHbL0AE4Q6AEwCXoECAoQAQ#v=onepage&q=space%20offense%20dominant&f=false) to hold an adversary’s space systems in jeopardy with destructive ASATs than it is to [sustainably defend](https://www.cnas.org/publications/commentary/the-us-military-should-not-be-doubling-down-on-space) a system, which is expensive and in some cases not technologically feasible because of limitations on satellite movement. Space is therefore [considered](https://books.google.com/books?id=VyXTDwAAQBAJ&pg=PA339&lpg=PA339&dq=space+offense+dominant&source=bl&ots=Mw0bgJ51qf&sig=ACfU3U3DeZiEHpr9nfszlCbJZIoyyssIpg&hl=en&sa=X&ved=2ahUKEwjrs-WD3IzpAhVulHIEHbL0AE4Q6AEwCXoECAoQAQ#v=onepage&q=space%20offense%20dominant&f=false) offense-dominant; offensive tactics like weapons development are prioritized over defensive measures, such as [improving GPS](https://www.politico.com/story/2018/04/06/outer-space-war-defense-russia-china-463067) or making satellites more resistant to jamming.

As a result, countries are left with poorly defended space systems and rely on offensive posturing, which increases the risk that their actions are perceived as aggressive and incentivizes rapid, risky counterattacks because militaries cannot rely on their spaced-based systems after first strikes.

There are several hotspots in which ASATs and offensive-dominant systems are particularly relevant. Early warning satellites [play](https://www.politico.com/story/2018/04/06/outer-space-war-defense-russia-china-463067) a central role in US readiness in the event of a conflict involving North Korea. News of North Korean missile launches comes from these satellites. Given North Korea’s [history](https://www.bbc.com/news/world-asia-pacific-11813699) of nuclear provocations, unflinchingly hostile rhetoric towards the United States and South Korea, and diplomatic opacity, North Korea is always a threatening, unknowable adversary, but recent developments have magnified the risk. With the health of Kim Jong-un [potentially in jeopardy](https://apnews.com/f5d302ae65b03838173e40848223b771), a succession battle or even civil war on the peninsula [raises the chances](https://www.express.co.uk/news/world/1273890/Kim-Jong-un-dead-North-Korea-nuclear-weapon-news-latest-death-US) of loose nukes. If the regime is terminal, traditional MAD risk calculus will become moot; with nothing to lose, North Korea would have no reason to hold back its nuclear arsenal. Or China [might decide](https://foreignpolicy.com/2020/04/28/kim-jong-un-china-north-korea/) to seize military assets and infrastructure of the regime. If the US does not have its early warning satellites because they have been taken out in an ASAT attack, the US, South Korea, and Japan are all in imminent nuclear peril, while China could be in a position to fundamentally reshape East Asian geopolitics.

The South China Sea is another hotspot in which ASATs could risk escalation. China [is developing](https://missiledefenseadvocacy.org/missile-threat-and-proliferation/todays-missile-threat/china-anti-access-area-denial-coming-soon/) Anti-Access Area Denial (A2/AD) in the South China Sea, a combination of long range radar with air and maritime defense meant to deny US freedom of navigation in the region. Given the disputed nature of territory in the South China Sea, the United States and its allies do not want China to successfully close off the region.

#### Water wars have occurred for decades – Kashmir skirmishes, localized resources grabs, etc. – no brink and they don’t escalate

#### Ecological tipping points are “scientific garbage” and lack data---effects are slow and localized

Brook et al. 18 — Barry W. Brook, ARC Australian Laureate Professor and Chair of Environmental Sustainability at the University of Tasmania in the Faculty of Science, Engineering & Technology, Erle C. Ellis, Ph.D., Cornell University, 1990 Professor, Geography & Environmental Systems University of Maryland, and Jessie C. Buettel, “What Is the Evidence for Planetary Tipping Points?” In Effective Conservation Science: Data Not Dogma, Chapter 8, Oxford University Press (2018). http://ecotope.org/people/ellis/papers/brook\_2018.pdf

\*The Nine Planetary Boundaries Brook Et Al. Refer Too Are, “Land-Use Change, Rate of Biodiversity Loss, Phosphorus Cycle, Global Freshwater Use, Ocean Acidification, Climate Change, Stratospheric Ozone Depletion, Atmospheric Aerosol Loading, Chemical Pollution, Terrestrial Net Primary Production, and Biodiversity Intactness”

As living standards, technological capacities,

and human welfare have continued to improve, concerns have mounted about possible natural limits to economic and population growth. Climate change, habitat loss, and recent extinctions are examples of impacts on natural systems that have been used as markers of global environmental degradation associated with the expanding influence of humans (Barnosky et al., 2012; McGill et al., 2015). Past civilizations have faced rapid declines and even collapsed in the face of regional environmental degradation, drought, and other environmental challenges (Scheffer, 2016; Butzer and Endfield, 2012). This begs the question of whether long-term societal relationships with the planet’s ecology may be approaching a global tipping point as the human population hurtles toward ten billion people. If this is indeed the case, the future of both biodiversity and humanity hangs in the balance. The hypothesis is that without urgent action to prevent reaching a global tipping point, the natural life support systems that sustain humanity may fail abruptly, with drastic consequences. 8.1 Regional tipping points yes— but what about global tipping points? There is strong evidence for rapid global shifts in the biosphere in the distant past, sometimes taking the form of mass extinction events, which have been linked to biophysical tipping points (Hughes et al., 2013). Tipping points occur when components of a system respond gradually to an external forcing to a point at which the response becomes nonlinear and abrupt. This response is often amplified through positive feedback interactions that induce an eventual state (or regime) shift (Lenton, 2013). Tipping points are well documented in studies of local ecosystems, such as lakes, that undergo regime shifts driven by alterations of energy or nutrient flows when thresholds are crossed and hysteresis prevails (Scheffer et al., 2015). Various tipping elements, some definite and others speculative, have also been noted in the Earth’s climate system (Lenton et al., 2008). Given this context, it would seem logical and indeed intuitive to conclude that the Earth system is susceptible and sensitive to planetary regime shifts caused by human alteration of Earth’s ecology. James Lovelock’s original Earth-system conception of “Gaia,” for instance, focused on interconnections and positive feedbacks between the geosphere and the biosphere, which act to promote stability and resilience (Lovelock and Margulis, 1974). But within this same framework, a temporary global forcing event, invoking disconnections and positive feedbacks, could lead to a rapid transition to an alternative stable state, as has been observed in many local systems (Kefi et al., 2016). This conceptual model invites the question of whether identifiable “boundaries” exist within the interacting components of the Earth system. If they do—and they are transgressed—then the planetary biosphere might be dramatically and permanently altered (Brook et al., 2013). 8.2 Planetary boundaries as a seductive policy framework The planetary boundaries concept, coined less than a decade ago (Rockström et al., 2009), represents the idea that contemporary societies have potentially transgressed the historical “natural” conditions— the “safe operating space”—under which human societies have historically thrived. However, to mark the boundaries of a planetary safe “reference state,” defined baselines are required. One possibility that has been suggested is the climatic conditions that marked the last 10 000 years of our current warm interglacial period, the Holocene, in which agricultural and urban societies first arose, should be used as a safe space (Steffen et al., 2015). Other safe spaces (or conversely boundaries) might be similarly recognized. In total, nine planetary boundaries have been hypothesized in association with Earth-system processes that, if sufficiently distorted, might potentially cause harmful changes in Earth’s functioning as a wholistic system (Table 8.1). This perspective has led some to postulate the potential breaching of critical thresholds, pushing the Earth out of the Holocene and consequently inducing a shift in the stability of the system (Barnosky et al., 2012). To quote: “Crossing these boundaries could generate abrupt or irreversible environmental changes.” (stockholmresilience.org/ research/planetary-boundaries.html). A hope often expressed is that flagging the crossing of these boundaries as a significant risk will provoke decision makers and the public into taking actions to mitigate harmful global changes (McAlpine et al., 2015). Such a framework, of global tipping points counterbalanced by secure safe spaces within planetary boundaries, is conceptually elegant and politically seductive. Notably, this implies two possible conditions—a state in which environmental change is without risk, and another in which risk is clear and action necessary. Such a framework is both constraining and liberating, and clearly defines a safe zone in which human societies may go about their activities without risk. As a consequence, if such clear knowledge on the risks of altering global environmental processes existed, a defined set of boundaries could be extremely useful to decision makers. But is there evidence of global tipping-point dynamics with safe space and global risk clearly demarcated? 8.3 The search for mechanisms and evidence in support of the nine planetary boundaries Since its original publication, the planetary boundaries framework, including the related concepts of a “safe operating space” and global regime shifts, have become increasingly prevalent in scientific and policy discussions concerned with global change (Corlett, 2015). This work has been heavily cited, updated, and actively promoted as a policy tool. But there has also been a counter-vailing critique that challenges the universality, utility, and even the underlying validity of the planetary boundaries framework (Brook and Blomqvist, 2016; Lenton and Williams, 2013). The underlying bases for this debate stem from disagreements over technical and scientific issues, including questions of scale, scientific underpinning, deterministic “boundary setting,” and the generality of mechanisms proposed. Most of the nine processes and systems listed in Table 8.1 lack theoretical mechanisms or evidence for a causal connection from local perturbations to global “boundary crossing” (Brook et al., 2013). The exceptions are the atmospheric and oceanic systems, which seem to most closely fit the characteristics required for a globally “scaled-up” version of the coupled, non-linear dynamics that have been shown to undergo phase shifts. But for others, like global land use or worldwide biodiversity, it is difficult to conceive how aggregated local-to-regional measures are representative of a coherent planetary system that is prone to tipping (Mace et al., 2014). Moreover, anthropogenic pressures vary geographically, and the system responses to stressors can be highly heterogeneous (Reyer et al., 2015). While global tipping points have been hypothesized, their exact “position” has not been determined. If the boundaries did exist at a global level, there is a good chance they could not be known until well after the regime shift or boundary crossing had occurred. This is because of our lack of our understanding of complex systems and the wild fluctuations in state variables that have occurred historically and continue to occur, without any evidence of an irreversible global collapse. Finally, implementing policies that avoid crossing planetary boundaries is a “global commons” problem, and everything we know from climate action indicates that it is difficult to generate agreements that address such risk when there is uncertainty about thresholds (Barrett and Dannenberg, 2012). 8.4 The problem with going from local process to a global tipping point For at least six of the nine proposed boundaries, the operational scales of these “Earth system processes” are local or regional (Table 8.1), yet the proposed boundaries represent global aggregations (the sum of many component sub-systems). The value assigned to any particular boundary is, in virtually all cases, speculative and represents an arbitrary point along a continuum of possible values, as opposed to a phase shift due to global non-linear dynamics. The most plausible threshold is for ocean acidification, because it is directly related to the calcite and aragonite compensation depth (i.e., something that is inherently quantifiable). The others are purely supported by a statement to the effect that “this stress or change from the baseline is deemed excessive.” This lack of scientific underpinning for these boundaries raises significant questions on the biological and physical relevance of such thresholds for the Earth system. What is currently needed are explicit efforts to link long-term monitoring to the choice of these boundary values (Robert et al., 2013). Unquestioning acceptance of these boundaries that in turn guide subsequent global assessment (as in Newbold et al., 2016) will only inhibit our understanding of human impacts. In addition to masking finer-grained detail, globally averaged or aggregated metrics are also often difficult to link to directed action. For instance, the recent Paris Agreement to limit average global temperature rise to less than 2 °C above pre-industrial levels was ultimately re-framed as a plethora of national goals or aspirations based on carbon-emissions intensity (Rogelj et al., 2016). This is partly because a “global temperature,” averaged across all the Earth system, is not a real physical phenomenon or quantity observed in any place. As such, it cannot be used to guide or monitor local system states. What can be monitored and altered are the trajectories of the underlying drivers of system changes (e.g., carbon emissions intensity, in the climate case), and these therefore ought to be the domain of targets. Even if one can identify and measure a global environmental attribute, it does not automatically follow that it is associated with a real-world threshold that, when crossed, leads to irreversible change. Asserting “safe” global limits on indicators like land-use change (the boundary of a maximum of 15% of land given over to cultivation, see Table 8.1) or decline in the local species abundance of originally present species (e.g., “10% loss relative to undisturbed habitat” as is the case in Newbold et al., 2016) is totally arbitrary. Such thinking ignores inherent complexity and promotes a “one size fits all” mode of thinking for conservation management that elides the very real need for locally appropriate solutions. Trying to avoid crossing a global land-use or biodiversity boundary might also lead to perverse outcomes locally, such as if restoring a “safe level” of biodiversity intactness in the world’s most fertile and productive regions (where most food originates) triggers undesirable trade-offs such as the displacement of farming to marginal regions that require more land, greater inputs, and hardship. In the context of food production, Running (2012) recently argued that at most an additional 10% of harvestable annual net global primary production (NPP) of terrestrial plants could be co-opted for future human use without crossing out of the planetary safe space. The implications of this assertion are draconian. Global NPP has been essentially steady, even with the massive agricultural expansion that has occurred over the last century. Thus, because the allocation of NPP is essentially a zerosum activity, asserting that humans can only get at most an additional 10% of that NPP implies future shortages of food, fiber, fodder, and fuel for people (Erb et al., 2012; Lewis, 2012). Policy based on this boundary would be fraught with human suffering, while the boundary itself has little mechanistic support or clear evidence of existence. In a similar vein, seeking to achieve uniform limits on practices such as nitrogen or phosphorus fertilizer use would inevitably lead to winners and losers at local scales (de Vries et al., 2013), because of differences in soil fertility and the legacies of historical farming practices (Erb et al., 2012; Carpenter and Bennett, 2011). For instance, while nitrogen fertilizer has been over-used in many developed countries, increases are urgently needed in sub-Saharan Africa to close the yield gap (Mueller et al., 2014). Given the consistent need for regionally appropriate limits, what practical use is a globally defined boundary? 8.5 Finding the research questions in an arena that is rife with competing visions of desirable futures Planetary boundaries are typically based on biogeochemical and ecological principles. Their frame is simple: if we pass threshold “X,” then the following ecological degradation or regime shift will occur. What this framing neglects is that there are inevitable trade-offs between human development goals and environmental protection/risk. Policy based on any assumed boundary will substantially impact development options. For the most part, truly natural areas are not the main “life support systems” for humanity; instead, people rely on those ecosystems that have been modified or engineered (Ellis et al., 2013). If it comes down to a choice between improved human development and the potential risk of transgressing an uncertain (and data poor) planetary boundary, it may be that society is willing to accept that risk. Science has a vital role in guiding environmental management. Ultimately, however, science must intersect with human decisions: physical laws are not negotiable, but our response to them is (Larsen et al., 2015). Global change is not a societal construct, so we must avoid the temptation to couch scientific models as policy directives. Value judgements do (and must) play a key role in determining how people respond to global environmental challenges and the possibility of inflexible planetary boundaries. What has become starkly apparent from the debate on planetary tipping points and possible global regime changes is the need for a concerted research agenda aimed at the potential links between biophysical and social systems to determine possible boundary “positions.” This research could come in the form of: (1) empirical examinations of regime shifts (or not) under gradual degradation; (2) models that explicitly link ecosystem changes and hypothesized boundaries to specific upheavals; and (3) explorations of how the framing of a boundary influences decision makers. For instance, our approach to Earth-system simulations is sophisticated for climatic components but lacks the resolution and mechanisms needed to test ideas on the planetary interconnectedness of nutrient and energy flows, or feedbacks across global biomes (Harfoot et al., 2014). The Madingley model of ecosystem dynamics (https://madingley.github. io/about) offers one promising example of an innovative attempt in this direction, because its design goals are to explicitly capture the scaling of processes that affect biodiversity from local to global scales (Purves et al., 2013). We can also seek a better understanding of the mechanistic underpinnings of the drivers of changes in global systems, such as land-use change and agricultural intensification. This could generate empirically based “bottomup” forecasts of trajectories, which, when linked to multi-ecosystem models, should improve our forecasts of the risks of planetary state shifts (Brook and Blomqvist, 2016). One of the appeals of planetary boundaries is the hypothesis that it resonates as a narrative for environmental action. The question is: how do decision-makers respond to these boundary arguments? Some research suggests that thresholds inhibit collective actions against tragedies of the commons (Barrett and Dannenberg, 2012). This is a field ripe for theoretical and empirical study. We also need to ask the hard questions about whether conceptual models like planetary boundaries the most effective strategy and engagement tool for conservation and mitigation are. The difficulty in getting international agreement on climate targets (e.g., the 2 °C “guardrail”) is an obvious case in point (Symons and Karlsson, 2015). Perhaps focusing on planetary opportunities: leverage points for guiding global change in better directions (e.g., carbon-neutral energy systems) is potentially a more effective focus of scientific attention (DeFries et al., 2012). By focusing on something to be averted as opposed to an outcome to be achieved, we risk breeding complacency on one side of a boundary, and hopelessness on the other. To summarize the above: the biosphere, and much of the geosphere, responds to external pressures in many and varied ways. The global human enterprise is driving large-scale changes in most components of the Earth system, but in a haphazard fashion, with responses often being weakly connected or transmitted slowly at a cross-continental scale. What we observe, for the global processes compiled in Table 8.1, is largely just the sum of all those changes. Acknowledging this reality should not be taken as diminishing the seriousness of these impacts or denying that major changes are occurring to the biosphere, atmosphere, and hydrosphere due to human activity. But it does make it implausible that the planet, or indeed most of its component systems, are primed to tip irreversibly to a radically different state that is inhospitable. Although the goal of sustainable stewardship of our planet is a laudable and an achievable one, the mechanisms and opportunities to conserve biodiversity and ecosystems lie mostly in targeted, localized actions (Jonas et al., 2014).

#### Warming melts the Arctic—allows trans-Arctic cables that solve cable cutting

Sorokanich 14

(Robert Sorokanich received his BS in Biochemistry from Syracuse University and attended the Jefferson Medical College at Thomas Jefferson University. He was a researcher at the James C. Dabrowiak Lab, Editorial Fellow at Gizmodo, and Auto News Reporter for Hearst Digital Media. Sorokanich, R. “The Trans-Arctic Internet Cable Project Made Possible by Climate Change,” Gizmodo, 8/09/2014, http://gizmodo.com/the-trans-arctic-internet-cable-project-made-possible-b-1618696732//ghs-kw)

Running a telecom cable from London through the Northwest Passage to Tokyo was, for a very long time, impossible: The sea route was solid ice year-round. Now, thanks to rising temperatures, the ice disappears from August to October, and a Canadian telecom startup wants to thread a 10,000-mile internet cable through that gap. Toronto-based Arctic Fibre will soon start surveying the underwater route that would connect the UK with Japan and several spots in between, diversifying the globe's fiber optic data network without relying on land-based cables going through volatile regions of the Middle East, as current connections do. Similar projects, on a much smaller scale, have recently been completed to connect Russia and Crimea. As BuzzFeed reports, telecoms and corporations are clamoring for redundant data connections, still wary of the trouble caused in 2008 when disruptions to the Mediterranean Sea cable slowed or stopped communications across Asia. But routes through the Middle East could make tempting targets for disruption. The Arctic Fibre project would avoid that exact scenario: Aside from its termini in England and Japan, and an anchor point in Canada, the cable would run almost entirely undersea. This, of course, will require elaborate surveying to find a path where the cable won't get snagged by rocks, pulled by tides, or crushed by rock slides. The $620 million project will also bring internet connections to northern Alaska and regions of Canada where data is often unreliable. Undersea surveying will begin in the next few months, using side-scan sonar, digital cameras, electromagnetic probes, and core samples to plot a route across the sea floor. In the past, such a surveying trip wouldn't have been feasible due to year-round ice. Doug Cunningam, Arctic Fibre's CEO, didn't mince words when he explained to BuzzFeed why this project is now feasible: "It is made possible by climate change."

#### Cable cuts deck military readiness

Sechrist 10

(Michael Sechrist is the former project manager and research fellow for ECIR. He is an expert on undersea communication cable security policies and economic models and is the author of "Cyberspace in Deep Water: Protecting Undersea Communications Cables", a policy paper presented to the Department of Homeland Security in spring 2010. He has presented these findings to the Pacific Telecommunications Council and the International Cable Protection Committee (ICPC) and has helped the ICPC develop the first international public-private partnership to protect undersea cables. Current Affiliation: Vice President for Threat and Risk Management. Prepared by Michael Sechrist of the Harvard Kennedy Schoool for the Department of Homeland Security, “CYBERSPACE IN DEEP WATER: PROTECTING UNDERSEA COMMUNICATION CABLES,” 3/23/2010. http://belfercenter.ksg.harvard.edu/files/PAE\_final\_draft\_-\_043010.pdf//ghs-kw)

A “September 10th” mindset permeates relations between the United States (“U.S.”) government and undersea communications cable companies. Communication before and after a cable break is sparse, disjointed and compartmentalized. For catastrophic cable outages, no coordinated mitigation plan exists. Nor is there adequate defense-in-depth in place. There is plenty of room for improvement among all parties. To improve the process, this paper proposes that the Department of Homeland Security create an international public-private partnership to prevent and prepare for the world’s next major cable outage. Cables are vital to global communications and U.S. interests. In the U.S., approximately 95% of all international internet and phone traffic travel through undersea cables.1 Nearly all government traffic, including sensitive diplomatic and military orders, travels these cables to reach officials in the field. In the military, DoD’s net-centric warfare and Global Information Grid (e.g., DoD’s information interoperable system) rely on undersea cables.2 The GIG uses undersea communication cables to provide large segments of DoD personnel living and working overseas with fast, reliable and relatively cheap communication.3 4 A major portion of DoD data traveling on undersea cables is unmanned aerial vehicle (UAV) video.5 In 2010, UAVs “will fly 190,000 hours”6 and the Air Force estimates that “it will need more than one million UAV hours annually to be prepared for future wars.”7 Without ensured cable connectivity, the future of modern warfare is in jeopardy. The stability of the modern financial system is also at risk. Companies use cables to transfer trillions of dollars every day. For example, the Society for Worldwide Interbank Financial Telecommunication (SWIFT), which describes itself as “the global provider of secure financial messaging services,” uses undersea fiber-optic communications cables to transmit financial data between 208 countries.8 In 2004 alone, nine million messages and approximately $7.4 trillion a day was traded on this network.9 Today, nearly 15 million messages a day are sent over it. The CLS Bank, which “operates the largest multi-currency cash settlement system,” conducts over one million transactions and trades over $4.7 trillion dollars a day on the same undersea cables.10 As Stephen Malphrus, Chief of Staff to Federal Reserve Chairman Bernanke recently noted, “When communications networks go down, the financial services sector does not grind to a halt, rather it snaps to a halt.”11 When a cable does lose service, the economic impact is difficult to quantify. One estimate from the International Cable Protection Committee’s legal advisor states that “…service interruptions of these high-bandwidth underwater fiber optics communications systems can result in excess of $1.5 million revenue loss per hour.”12 His estimate deals primarily with losses from cable operator, not those from companies or government entities that own bandwidth on the disrupted cable. In that respect, as well as the fact the estimate is five years old, it can be considered quite low.

#### Readiness collapse causes global war

Spencer 00

(Jack Spencer, Senior Research Fellow at The Heritage Foundation's Roe Institute for Economic Policy Studies, “The Facts About Military Readiness”, Heritage Backgrounder #1394, 9-15, http://www.heritage.org/research/reports/2000/09/bg1394-the-facts-about-military-readiness)

Military readiness is vital because declines in America's military readiness signal to the rest of the world that the United States is not prepared to defend its interests. Therefore, potentially hostile nations will be more likely to lash out against American allies and interests, inevitably leading to U.S. involvement in combat. A high state of military readiness is more likely to deter potentially hostile nations from acting aggressively in regions of vital national interest, thereby preserving peace.

### Adv 2

#### No impact – didn’t get to it and no new 1ar impacts bc 1nc premised on aff reading complete args but we’re turning upholding international law

#### China violates the OST – thumps – one is enough to spill-over per their evidence.

Ortega 21 Almudena Azcárate Ortega "Placement of Weapons in Outer Space: The Dichotomy Between Word and Deed" <https://www.lawfareblog.com/placement-weapons-outer-space-dichotomy-between-word-and-deed> (Georgetown Law)

The United States criticized that test as “inconsistent with the spirit of cooperation that both countries aspire to in the civil space area.” The European Union’s condemnation was even stronger, expressing that “such a test is inconsistent with international efforts to avert an arms race in outer space.” In the face of China’s actions, the EU “call[ed] upon all signatory states [of the Outer Space Treaty] to abide by their commitment to exercise their space activities in accordance with international law and in the interest of maintaining international peace and security.” Japan’s condemnation of the ASAT test was perhaps the harshest of all since it expressly asserted that such activity constituted a violation of existing international law. Prime Minister Shinzo Abe claimed that China’s kinetic ASAT demonstration constituted a violation of the Outer Space Treaty. He did not elaborate on what clause China had violated with its actions, but some observers have speculated that Abe believed China’s test, which littered outer space with dangerous debris, to be a violation of the duty of due regard codified in Article IX of the Outer Space Treaty. Under this principle, states are bound to refrain from any acts that might adversely affect the peaceful use and exploration of outer space by other stakeholders.

#### OST fails to stop Weapons.

Pappalardo 18 [Joe Pappalardo, contributing editor, author of “Spaceport Earth: The Reinvention of Spaceflight,” Jan 25, 2018, “No Treaty Will Stop Space Weapons,” Popular Mechanics, [https://www.popularmechanics.com/space/satellites/a15884747/no-treaty-will-stop-space-weapons]](https://www.popularmechanics.com/space/satellites/a15884747/no-treaty-will-stop-space-weapons%5d)

Don't be fooled by the Russian outcry, though. Lavrov’s rhetorical double-take is significant: The difference between “weaponizing space” and “putting weapons in space” is a big one. China and Russia very much want to bring war to space—on their own terms. "They've been building weapons, testing weapons, building weapons to operate from the Earth in space, jamming weapons, laser weapons, and they have not kept it secret," Gen. John Hyten, the head of US Strategic Command, said in a recent public speech in California. Any discussion about weaponizing space will reflexively cite the Outer Space Treaty of 1967, which many erroneously think forbids it. The reality is that a slew of interesting, martial systems have been researched, tested, and even fielded over the decades. Orbit is already a pivotal battleground. And there’s not a piece of paper in the world that can stop it. Nukes on the Moon It's June 9, 1959, in Washington D.C. U.S. Army Lt. Gen. Arthur Tredeau files a report detailing Project Horizon, a military base on the moon. “The employment of moon-based weapons systems against Earth or space targets may prove to be feasible and desirable,” the report says. "If hostile forces are allowed to arrive first they could militarily counter our landings.” Back then it was not a stretch to think the moon could be a base for nuclear missiles. In a world ruled by mutually assured destruction, the gold standard was putting missiles where they could not be attacked, ensuring a nation's ability to strike back. ”Moon-based military power will be a strong deterrent to war because of the extreme difficulty, from the enemy point of view, of eliminating our ability to retaliate,” the Project Horizon report states. Still, Cold War military planners in Russia and America knew that mutually assured destruction was the best guarantee that nukes would never fly. MAD is often attacked a lunatic’s gamble (it certainly sounds crazy when you think about it too hard). But it worked, and MAD remains the foundation of national security strategy, especially today as North Korea builds its arsenal. Any technology or strategy that threatens the balance of nuclear-armed powers is seen as dangerously destabilizing. This can be seen in the arguments against the Star Wars program in the 1980s, and the current critics of hypersonic weapons who point out they could be confused for nukes, sparking retaliation. That’s how the “Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space" came to be passed in 1963. It stated that signees “refrain from placing in orbit around the earth any objects carrying nuclear weapons or any other kinds of weapons of mass destruction or from installing such weapons on celestial bodies." So much for Project Horizon. The intent of that '60s treaty is to preserve MAD. It does this by keeping all nukes within range of other nukes—on the Earth. But this single-minded focus on WMD left a large loophole. While the treaty was expanded in 1967, there is no prohibition against conventional weapons in space. That's crucial, because there’s been a subtle but vital shift in the way national leaders view space weapons in the decades since Project Horizon. Until recently, the arguments surrounding space weapons have been part of the calculus of nuclear warfare. But now, because of technologies like GPS, the United States has demonstrated how vital space is to a modern military, starting in the Gulf War and only growing in importance since. Space war concerns are turning toward the tactical. In a conventional shooting war, disabling U.S. sats blunts the precision weapons and navigation systems that enable the U.S. military to operate. You can see, then, why the Chinese and Russians are very interested in banning conventional weapons in space, but not so interested in banning weapons that could ~~blind~~, kill, or ~~disable~~ [impede] satellites from Earth. Paperwork Limbo It's November 5, 2015, at the United Nations 70th General Assembly on Disarmament and International Security. This is the place where world powers debate matters of weapons, war, and security. Today, the topic the China-Russia sponsored "Prevention of an Arms Race in Outer Space." The language is rich with irony, considering who wrote the resolution. In 2007 China shot down one of its own satellites in low earth orbit, sending a ring of orbital space debris spiraling in a ring over the globe. It conducted another test in 2014, prompting Air Force Lt. Gen. Jay Raymond to say that, “soon every satellite in every orbit will be able to be held at risk.” The United States does not back the resolution. “This proposal does not adequately define what constitutes a weapon in outer space,” UN Ambassador Robert Wood tells the Assembly, and that "it would not enable effective confirmation" (read: there's no way to be sure Russia and China won't cheat). Wood adds that the language focuses exclusively on space-based weapons and overlooks earth-based anti-satellite weapons.

#### China hijacks any robust international legal regime – decks US access to strategic advantages in space

White 21, Bret Austin White, “Reordering the Law for a China World Order: China’s Legal Warfare Strategy in Outer Space and Cyberspace”, 2/2/21, Journal of National Security Law and Policy, Cybersecurity, VOL.11 NO. 2 mvp

Nor is China taking a passive approach to its growth in power and biding its time as it has seemed to do in the recent past in accordance with Deng Xiaoping’s wisdom.9 As China is on a path of returning to a position of leadership in the region and beyond, it has begun to enlist Chinese international law scholars to implement a state policy of ‘legal warfare’ to shape the future for a more powerful China. The application or formation of international law in areas of new and advancing technologies, such as innovations in outer space capabilities and activity in and through cyberspace, can be particularly challenging due to the lack of specific treaties and the dearth of state practice directly on point. As such, these areas – precisely the ones Yan advised China should focus its efforts – are particularly susceptible to manipulation by a determined state actor such as China.

In theory, all states that are active in international relations have a foreign policy strategy that helps that state reach its long-term goals. China’s strategy is born from a deep seeded, millennia old manner in which China sees itself in relation to other states and in relation to the international order. China’s political reality, for much of the last two thousand years, has been a “natural dominion over everything under heaven, a concept known in the Chinese language as tian xia.”10 This paper argues that China’s state policy of manipulating international law in outer space and cyberspace will be informed by the tianxia worldview of China as benevolent leader, will increase China’s relative power, and will empower its authoritarian state. Such an approach is also well in line with Yan’s theory of how a rising power would act when it is replacing a dominant power.11 He posits that during a change in global leadership, norms will change as well: “When the new international leadership is of a different type than the previous one, it will establish a new type of norms for purposes of maintaining its dominance of the international system.”12 China’s behavior in the areas of outer space and cyberspace – seeking to take a leadership role and shape norms – is preparing the environment for when it will be one in a bipolar global order or, depending on the actions of the United States, perhaps the global leader in a shifted unipolar order.

#### Independently uses space coop to bolster perception of credible leadership – that causes nuclear war and conventional conflict in the SCS

Fisher 15 Richard D. Fisher 2-8-2015 “China’s Military Ambitions in Space and America’s Response” <http://www.uscc.gov/sites/default/files/Fisher_Testimony_2.18.15.pdf> (President of Pacific Strategies, Inc)//Elmer

As with the former Soviet Union, China’s pursuit of regional and then global military power is not rooted in an existential threat, but in the CCP’s fears for its power position. This requires a CCP-led “rejuvenation” of China, entailing mobilization for greater power, ever more control over its own people, and then increasing control over others. Another result is China’s choice to be hostile to Western rules or concepts that may constrain China’s power. This justifies an essential Chinese rejection of American or Western conceptions of transparency and restraint, or verifiable weapons control in space which might constrain its power. This mirrors the CCP/PLA’s repeated refusal of U.S. requests to consider real nuclear weapons transparency and control, transparency over its nuclear and missile exports, and --from many of its neighbors and Washington -- fair settlement of territorial disputes which threaten war. The latter, especially in the South China Sea, is instructive. As it has gained military power in the South China Sea, China has sought to change the strategic environment and dictate new rules to increase its security at the expense of others. Once it gains commanding strength and position in space, will China do the same? For the United States, cooperation with China in space may yield some benefits, but it likely will have little impact on the direction and severity of terrestrial conflicts which will dominate relations with China. One can see the value of meeting with Chinese space officials, especially higher CCP and PLA leaders, to advance concerns over their actions in space and to promote transparency. But at this juncture, before China has achieved levels of “space dominance”, it is crucial to link any real cooperation with China to its behavior in space and elsewhere which threatens U.S. security. Furthermore, allowing China increasing access to U.S. space technology, space corporations, or government institutions at this time presents two risks. First it could encourage China to advance an illusion of cooperation with the U.S. and the West while differences on Earth become sharper. This could become useful for Beijing to deflect criticism on other issues, or even to obtain leverage over U.S. options and actions. Second, as has been proven repeatedly, China will exploit any new access for espionage gains to strengthen its own space and military sectors. 2 China’s increasing space power, however, like its growing economic and political power, cannot be “contained.” Russia appears ready to greatly expand space and military cooperation with China as part of a larger strategic alignment, while the European Space Agency is edging toward greater cooperation with China. These attractions may only increase if China has the only LEO manned space station in the mid-2020s. Already a top commercial space service and technology provider, China will use its gathering space diplomacy tools to aid its pursuit of economic, political and military influence in critical regions like Africa and Latin America. The challenge for the United States is to maintain the means to compete with China in space both in military and non-military endeavors. China’s potential for developing new space combat systems means the U.S. must be able to rapidly develop appropriate deterrent capabilities. There should also be a more developed U.S. capability to rapidly repopulate satellite systems taken down by PLA attacks, and there should be more terrestrial or airborne systems to compensate for lost navigation, communication and surveillance satellites. In addition, as the PLA moves substantially out to deep space, the Moon, or to the Lagrangian Points, it will be necessary for the U.S. to consider a compensating presence that is affordable, attractive to a coalition of democracies, and helps to deter China from seeking strategic advantage. Strategic priorities would suggest that a presence on or near the Moon is of greater importance than going to Mars. A multinational government-private presence on the Moon is one option, as is the likely less expensive option of a far cis-lunar presence to further develop manned deep space capabilities. As was the case with the former Soviet Union, relative peace on Earth or in space will not truly be possible until China evolves beyond its Leninist dictatorship. In its final years, the Soviet Union was on the cusp of deploying multiple space combat systems despite years of U.S.-Soviet space diplomacy. Real space cooperation between Russia the West became possible only after the fall of the Soviet Union, and may again become threatened by Russia’s slide into authoritarian aggression. Substantive cooperation with China in space offers no assurance that China will change its threatening behaviors on Earth or in space, but does create opportunities for China to exploit U.S. and Western space technology to gain potential military advantages.

#### Space militarization is inevitable, but the US getting there first prevents war and locks in primacy which saves allies – dominance independently creates stability and solves their space war scenarios

Solano 17 [Major Joseph Solano, USAF, M.S., Troy University; Master’s Thesis 1. REPORT DATE 9-06-2017 2. REPORT TYPE: Master’s Thesis “Weaponizing the Final Frontier: The United States and the New Space Race” http://www.dtic.mil/dtic/tr/fulltext/u2/1039544.pdf]

The transition into the twenty-first-century has brought about new space threats and challenges that the Truman era could not have predicted. The result of developing ASAT technology in the 1950s set in motion an ASAT war that escalated with the 2007 Chinese ASAT test. Following the ASAT test from China, Congressman Terry Everett (R, AL), the ranking Republican member of the Strategic Forces Subcommittee of the 19 House Armed Service Committee, referred to the test as a “clear wake up call for the Administration, Congress, and the American people,” and “apparently this single test is part of a broader effort to mature their direct-ascent ASAT capability and to develop a spectrum of counterspace capabilities.”34 The question at this point is not whether space will be weaponized, but when. Congressman Everett’s testimony is a consistent representation of many influential civilian leaders that share similar opinions. The need for a clear, bold, and transparent space policy allowing for unified action is critical in posturing future space forces. This is the consistent gap identified from previous advocates for weaponization of space. While the first step is to identify a gap, the second and most critical portion is the implementation of a clear and coherent strategy.

According to JP 3-14, Space Operations, space capabilities, and associated policies have continued to evolve since the beginning of the Space Race starting in 1955. The continued use and expansion of space had led to a congested, contested, and competitive environment.35 According to space doctrine, five major considerations exist when considering the use of space as an operational domain. The first consideration is vulnerability. The concept of vulnerability impacts all three main sectors of space: military, civil, and commercial. Joint doctrine recognizes the United States dependency on space assets and identifies the vulnerability associated with this reliance. Within the concept of vulnerability, joint doctrine also identifies the concept of purposeful 34 Terry Everett, “Arguing for a Comprehensive Space Protection Strategy,” Strategic Studies Quarterly (Fall 2007): 21-22. 35 Department of Defense, JP 3-14, Space Operations, I-1. 20 interference, which is the “deliberate actions taken to deny or disrupt a space system, service, or capability.”36 Purposeful interference is an important term to understand because it warns all enemies that an act on a space system is an act of war. It is critical that the commander’s understand the enemy’s capabilities in order to characterize, identify, and recognize interference. The second consideration is freedom of action.37 The U.S. government believes that, as a world superpower, it has the ability to use space capabilities at any given time and place without interference by enemy forces. At the core of this consideration is developing the ability to protect critical space assets. The third consideration is protection.38 This consideration intends to not only protect the space system, but also the supporting infrastructure to ensure capability is available when needed. Global reach and responsiveness is the fourth consideration and focuses on uniqueness of space and the limitations with respect to reconstitution of systems. The ability to replace satellite systems is not a rapid process and takes years. This limitation emphasizes the protection aspect of these national space capabilities. Last, space deterrence is the ability to utilize joint force operations to ensure protection against U.S. space capabilities.39 All five of these considerations focus on the protection of maintaining U.S. space superiority and represent a small shift towards a space weaponization strategy. JP 3-14 is the single joint publication for space operations. While 36 Department of Defense, JP 3-14, Space Operations, I-2. 37 Ibid. 38 Ibid. 39 Ibid. 21 the publication escalates the aggressive language and hints towards a weaponization mentality, the official guidance and direction to unify the space community is absent. The core of this document focuses on space as a force enabler, not as a weaponization capability equal to air, space, and cyber. There is a major gap in joint doctrine regarding the transition of space pacification and weaponization. Doctrine must reflect the current threat environment and lay the groundwork towards a strategy that will deliberately focus efforts towards a singular vision. Current doctrine fails to provide the necessary vision and guidance to combat future challenges or threats in the space domain.

Along with the shift in aggression in joint doctrine, President Obama’s National Space Policy of the United States of America echoes a similar message as Joint Publication 3-14. The National Space Policy Principle states: The United States will employ a variety of measures to help assure the use of space for all responsible parties, and, consistent with the inherent right of self defense, deter others from interference and attack, defend our space systems and contribute to the defense of allied space systems, and, if deterrence fails, defeat efforts to attack them.40

This is the most aggressive space policy to date, and indicates a transition from militarization to the cusp of weaponization. Satellite systems are now equivalent to an airplane, ship, or tank, and the United States must prepare to defend these systems from attack.41 The next logical step is the development and execution of this philosophy to secure national interests. Just as with any mission set, guidance must be clear to enable 40 Barak Obama, National Space Policy of the United States of America (Washington, DC: White House, 2010), accessed 15 October 2016, 3, https://www.whitehouse.gov/sites/default/files/national\_space\_policy\_6-28-10.pdf. 41 George W. Bush, U.S. National Space Policy (Washington, DC: White House, August 2006), accessed 20 October 2016, https://fas.org/irp/offdocs/nspd/space.pdf. 22 unified action. The inconsistency and disconnect with current policy and the threat environment only causes delays in designing, creating, and launching weaponization capabilities from space. The United States will not always have the luxury of neutrality regarding the topic of space weaponization. Former President Obama and President Trump are at a critical juncture requiring key decisions on the future of national space capabilities. Currently, the inconsistent messaging negatively impacts strategy by limiting national capability while allowing foreign nations to rapidly expand their space portfolio. The United States has the opportunity to take advantage and leverage its superiority in space as a critical capability.

While doctrine and policy are critical indications towards a policy of weaponization, inevitability is a mental construct and methodology that deserves consideration. Lieutenant Colonel (Lt Col) Thomas Bell describes the inevitability of space weaponization by stating “just as the role of US military operations in space has gradually shifted from scientific interest, through intelligence collection, to robust combat support, so it will continue to shift inevitably towards the weaponization of space.”42 Logically, this determination is a reasonable conclusion. Why would space be any different from all four other military domains? Lt Col Bell argues that “it is inevitable that mankind will weaponize space, and equally likely that this weaponization will occur with maturing of specific technologies over the next thirty years.”43 The ability for the United States to develop and integrate space into the military construct will provide the asymmetry required of future conflicts. Lt Col Bell believes that space weapons, which include the ability to conduct warfare in, from, or through space, will be required in the next major conflict of the United States due to the mandate to ensure freedom of access. 44 Future adversaries intend to create an asymmetrical advantage against the United State and the elimination of space superiority will create the desired effect. The three major requirements for space identified by Lt Col Bell are enhanced space surveillance; develop the capability to deny a potential enemy the use of space; and develop capability to protect United States space assets from the enemy.45 Bell’s analysis presents similar doctrinal gaps that exists in joint doctrine and national space policy, but adds a unique perspective that technology itself could be a major driver in the weaponization of space, not necessarily people. While Lt Col Bell illustrates the criticality of space operations to warfighting, his focus lacks the robustness on the methods to develop and shape a new space policy emphasizing weaponization and the impacts on the national instruments of power.

In Benjamin Lambeth’s book, Mastering the Ultimate High Ground, he presents an argument that the development of space weapons will complete and legitimize space as a true military power equal to land, air, sea, and cyber.46 Senior civilian leaders must recognize the importance of their military space subject matter experts in order to 44 Bell, 3. 45 Ibid., 11. 46 Benjamin S. Lambeth, Mastering the Ultimate High Ground: Next Steps in the Military Uses of Space (Santa Monica, CA: RAND, Project Air Force, 2003), 113. 24 develop a comprehensive strategy to protect the United States against all threats. Lambeth references Retired General Howell Estes, former United States Space Command Commander, to support one of his main points: If we examine the evolutionary development of the aircraft, we see uncanny parallels to the current evolution of spacecraft. . . . The potential of aircraft was not recognized immediately. Their initial use was confined to observation . . . until one day the full advantage of applying force from the air was realized and the rest is history. So too with the business of space . . . [military] space operations, like the land, sea and air operations that evolved before them will expand [into] the budding new mission already included into the charter of US Space Command . . . as they become more and more critical to our national security.47 While Lambeth intends to spark discussion and present information arguing both for and against supporting weapons in space, his research lacks the recommendations and framework to shape a new space policy. Lambeth states that the “United States possesses the essential wherewithal in principle to begin weaponizing space today. Reduced to basics, it is only a question of leadership choice, societal acceptance, and which particular force-employment alternatives to pursue first.”48 This statement targets the diplomatic instrument of power. This study will expand Lambeth’s focus towards reviewing all four instruments of power and operational variables to collect data and formulate a strategy intending to provide clarity and unity of effort towards space operations.

The Rumsfeld Commission is the core document of the twenty-first-century that highlighted the need for the United States to readdress their posturing for space. The 47 Howell M. Estes, III, “Doctrinal Lineage of Space” (lecture, AFA National Symposia, Los Angeles, CA, 18 October 1996), accessed 27 October 2016, http://secure.afa.org/AEF/pub/la6.asp. 48 Lambeth, 118. 25 Commission’s intent was to assess the current and future state of the national space capabilities while analyzing vulnerabilities associated to the threat environment. The major conclusion from the assessment was that the “U.S. is more dependent on space than any other nation” and cautions that adversarial nations will view that as a vulnerability.49 Tactics and techniques identified by the Rumsfeld Commission include denial and deception, jamming, microsatellite, and nuclear detonation.50 While the commission identified high-level strategies to reduce vulnerabilities, and called for the President of the United States to have the option to deploy weapons in space, official policy has yet to transition. The commission stated, “The United States must develop, deploy, and maintain the means to deter attack on and to defend vulnerable space capabilities,” but is missing the recommended doctrine and policy updates to incorporate into the national space strategy.51 The commission illustrates the need for “explicit national security guidance and defense policy to direct development of doctrine, concepts of operations, and capabilities for space, including weapons systems that operate in space and that can defend assets in orbit and augment air, land, and sea forces.”52 In addition to space policy, leadership must recognize that that robust training will be required to 49 Report of the Commission to Assess United States National Security Space Management and Organization pursuant to Public Law 106-65, the National Defense Authorization Act for Fiscal Year 2000, Section 1622, 11 January 2001, 18, accessed 16 September 2016, http://www.dod.gov/pubs/space20010111.html. 50 Ibid., 19-21. 51 Ibid., vi. 52 Ibid. 26 bolster any capability developments. Space professionals will require training on space systems to develop tactics, techniques, and procedures allowing for space superiority. In addition, the Rumsfeld Commission noted that in July 2000, “The Xinhua news agency reported that China’s military is developing methods and strategies for defeating the United States military in a high tech and space-based future war.”53 The Rumsfeld Commission used historical analysis to review warning signs of previous identified space scenarios that exposed vulnerabilities that could have resulted in catastrophe. The commission emphasized that the United States is ignoring warning signs of Chinese space aggression, allowing for unacceptable risk assumption. The commission report states, “Surprise is most often not a lack of warning, but the result of a tendency to dismiss as what we consider improbable.”54 If the Chinese weaponize space first, the United States would lose its space superiority along with a general decline in overall military capability. The results would be disastrous. Although the development of space weapons is not a simple task due to technology development and extreme cost, the commission recommends starting now. The value of the Rumsfeld Commission to this study is the identification of a growing threat against the space domain and a recommendation for a space strategy transition from militarization towards weaponization. This study intends to take the recommendations to the next level by actually developing strategy recommendations regarding developing space professionals and space policy, but falls short of implementable recommendations. Without formal guidance on the weaponization of space, the establishment of unified actions is unachievable. The United States cannot afford to continue the policy of wait and see.

#### Decline causes unstable nuclear alliances – escalates to multistate nuclear war

Hayes 18 [Peter Hayes, Nautilus Institute, Berkeley, California, USA; Center for International Security Studies, Sydney University. Trump and the Interregnum of American Nuclear Hegemony. November 8, 2018. <https://www.tandfonline.com/doi/full/10.1080/25751654.2018.1532525>]

During a post-hegemonic era, long-standing nuclear alliances are likely to be replaced by ad hoc nuclear coalitions, aligning and realigning around different congeries of threat and even actual nuclear wars, with much higher levels of uncertainty and unpredictability than was the case in the nuclear hegemonic system.

There are a number of ways that this dynamic could play out during the interregnum, and these dynamics are likely to be inconsistent and contradictory. In some instances, the sheer momentum of past policy combined with bureaucratic inertia and the potency of political, military service and corporate interests, may ensure that residual aspects of the formerly hegemonic postures are adhered to even as formal nuclear alliances rupture. Even as they reach for the old anchors, these states may be forced to adjust and retrench strategically, or start to take their own nuclear risks by making increasingly explicit nuclear threats and deployments against nuclear-armed adversaries – as Japan has begun to do with reference to its “technological deterrent” since about 2012.9 This period could last for many years until and when nuclear war breaks out and leads to a post-nuclear war disorder; or a new, post-hegemonic strategic framework is established to manage and/or abolish nuclear threat.

Under full-blown American nuclear hegemony, fewer states had nuclear weapons, the major nuclear weapons states entered into legally binding restraints on force levels and they learned from nuclear near-misses to promulgate rules of the road and tacit understandings. The lines drawn during full-blown collisions involving nuclear weapons were stark and concentrated the minds of leaders greatly. In a nuclear duel, it was clear that only one of two sides could fire first; the only question was which one. Now, with nine nuclear weapons states, and conflicts conceivably involving three, four or more of them, no matter how much leaders concentrate, it will not be evident who is aiming at who, who may fire first, and during a volley, who fired first and even who hit whom.

In a highly proliferated world, nuclear-armed states may feel driven to obtain larger nuclear forces able to deter multiple adversaries at the same time, sufficient to conduct not only a few nuclear attacks but configured to fight more than one protracted nuclear war at a time, especially in nuclear states torn apart by civil war and post-nuclear attack reconstruction. The first time nuclear weapons are used since 1945 will be shocking, the second time, less so, the third time, the new normal.

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