# 1NC

### 1

#### Interp: The affirmative must correctly tell the negative which aff they will be reading, including any and all changes, at the time of the online flip result.

#### Violation: screenshots – contacted on multiple platforms but didn’t get the email till afterwards – SS in the doc. Regardless sending the aff with less than a minute left links to our offense bc its not enough time to make an informed decision

Graphical user interface, text, application, chat or text message, email

Description automatically generated

#### Negate:

#### 1] Prep and clash - they force us to spend pre-round prep prepping multiple different affs which means I’m unprepared to engage - that decks clash and fairness. Also forces us to make a flip decision in the dark since we don't know if the aff is new or one of the 3 across your teammate’s wikis.

#### 2] Academic integrity – you hide the aff for your own advantage which is the definition of being academically disingenuous. That’s a voter since it destroys the constitutive purpose of debate as an educational activity.

#### Voters:

#### Competing interpretations—it tells the negative what they do and do not have to prepare for. Reasonability is arbitrary and unpredictable, inviting a race to the bottom and we’ll win it links to our offense.

#### Drop the debater to deter future abuse and because the 2N doesn’t get new disads to whole rez so it’s permanently skewed.

#### No RVIs—it’s your burden to be fair and T

#### T comes before 1AR theory –T affects a larger portion of the debate since the aff advocacy determines every speech after it

### 2

#### Interp: If the aff defends a restriction on appropriation they must specify to what level the restriction is and what forms of mining they ban.

Violation: Their aff just vaguely says restrict and cx proves – they say dangerous but that’s def not in the ptx which proves arbitarary

#### Vote neg for stable ground — restrict can mean anything from regulating forms of mining to a complete ban - that decks predictable neg ground because they can delink from DA by redefining the aff - for example, they could adopt a narrow definition of mining to delink from DAs like mining or innovation, or pivot to a broad definition if they’re behind on solvency

#### Independently, vote neg on presumption - private entities will just interpret restrict narrowly as possible which also splits multilateralism because different countries can restrict differently. If they fiat anything other than the plan that’s a voter for extra t – allows affirmatives to add on infinite planks to spike out of neg offense

### 3

#### CP: Space faring states should restrict space mining done by private entities except for space mining done for collection of scientific study.

#### Space samples are appropriated for scientific study—it’s uncontroversial as customary law but the plan bans it

**Pershing 19** (Abigail D., J.D. from Yale Law School. Robina Fellow at the Europcean Court of Human Rights. “Interpreting the Outer Space Treaty's Non-Appropriation Principle: Customary International Law from 1967 to Today,” 44 *Yale Journal of International Law* 149 2019)DR 22

The earliest hint of a change in customary international law relating to the interpretation of the non-appropriation clause came in 1969, when the United States first sent astronauts to the moon. As part of his historic journey, astronaut Neil **Armstrong** collected moonrocks that he brought back with him to Earth and promptly handed off to the National Aeronautics and Space Administration (NASA) as U.S. property.5 4 Later, the USSR similarly claimed lunar material as government property, some of which was eventually sold to private citizens.55

**These** first instances of space resource appropriation did not draw much attention, but they presented a distinct shift marking the beginning of a new period in State practice. Having previously been limited by their technological capabilities, States could now establish new practices with respect to celestial bodies. This was the beginning of a pattern of appropriation that slowly unfolded over the next few decades and has since solidified into the general and consistent State practice necessary to establish the existence of customary international law.

Currently, the U.S. government owns 842 pounds of lunar material.56 There is little question that NASA and the U.S. government consider this material, as well as other space materials collected by American astronauts, to be government property.5 7 In fact, NASA explicitly endorses U.S. property rights over these moon rocks, stating that "[1]unar material retrieved from the Moon during the Apollo Program is U.S. government property."

#### Private extraction key to study of space samples—costs

**OSI ND** (Outer Space Institute, network of world-leading space experts united by their commitment to highly innovative, transdisciplinary research that addresses grand challenges facing the continued use and exploration of space. http://outerspaceinstitute.ca/resources.html. No date but is referencing asteroid probes from 2021.)DR 22

Public-private partnerships are fostering the development of ISRU technology. NASA contracted [four private companies](https://www.nasa.gov/press-release/nasa-selects-companies-to-collect-lunar-resources-for-artemis-demonstrations/) to collect samples of regolith from the Moon’s south pole. Once collected, ownership of the samples will be [transferred to NASA in-situ](https://www.nasa.gov/press-release/nasa-selects-companies-to-collect-lunar-resources-for-artemis-demonstrations) as a move to kick-start space commerce and incentivize further investment in the development of ISRU technology. Additionally, [NASA awarded SpaceX](https://www.nasa.gov/press-release/as-artemis-moves-forward-nasa-picks-spacex-to-land-next-americans-on-moon) a $2.9 billion contract to build a human landing system that will carry astronauts to the lunar surface.

China has also made significant progress on the technological front with the success of their [Chang’e 5 spacecraft,](https://spaceflightnow.com/2021/01/01/chinese-mission-returned-nearly-4-pounds-of-lunar-samples/) which extracted a four-pound sample of lunar regolith and returned it to Earth.

The sample-return missions underway by [NASA](https://www.nasa.gov/osiris-rex) and [JAXA](https://www.hayabusa2.jaxa.jp/en/) serve as technological demonstrations of the possibilities, challenges, and dangers when interacting with asteroids. Other teams planning to do the same in the near future, some of which are commercial actors, will learn greatly from these missions

Mining asteroids could also become a very real prospect decades from now. New sample and return technology, namely the probes deployed by [JAXA](https://www.hayabusa2.jaxa.jp/en/) and [NASA,](https://www.nasa.gov/mission_pages/osiris-rex/about) have extracted material from the asteroids Ryugu and Bennu, respectively, and are returning it to Earth. Meanwhile, commercial launch companies, such as SpaceX, are drastically lowering the cost of launching equipment into space, making it accessible to a wider range of actors.

Despite[the declining investment into asteroid mining start-ups,](https://www.technologyreview.com/2019/06/26/134510/asteroid-mining-bubble-burst-history/) some ambitious companies remain waiting for a future date when it becomes economically feasible. In the meantime, they undertake other space activities, such as operating Earth imaging satellites, to maintain revenue streams.

Mining space resources, such as the Moon and asteroids, could greatly expand humanity’s knowledge about the origins of the solar system, the Earth, the abundance of water, and the origin of life. Ice and water-bearing minerals could be used to produce rocket fuel; fuel that, being sourced in space, will not need to be lifted – at great expense – out of Earth’s heavy gravity. Studying material from asteroids may also prove to be vital in humanity's defence against potential major impactors.

#### Specifically, SpaceX’s Starship enables sample collection at an unprecedented rate.

Heldmann et al 21 “Accelerating Martian and Lunar Science through SpaceX Starship Missions” May 2021 Jennifer L. Heldmann [NASA Ames Research Center, Division of Space Sciences & Astrobiology, Planetary Systems Branch], other authors listed in the article <https://surveygizmoresponseuploads.s3.amazonaws.com/fileuploads/623127/5489366/111-381503be1c5764e533d2e1e923e21477_HeldmannJenniferL.pdf> SM

Given the Starship’s anticipated low cost, high payload capacity, and potential for high flight cadence, the opportunities presented for planetary science missions have the potential to dramatically increase our progress towards NASA Planetary Science & Astrobiology goals and objectives. Building upon the NASA CLPS paradigm (Bussey et al. 2019), use of SpaceX Starships will allow for increased flights for science experiments, technology demonstrations, and capability development to enable human spaceflight missions through NASA partnership and purchase of flight payload accommodation. High priority science objectives as outlined in the Decadal Survey and NASA Strategic Plan for the Moon and Mars can uniquely be achieved through flights to lunar/Martian orbit and/or to the surface of these planetary bodies. In addition, Starship has the ability to deploy orbiters on approach. This capability would provide the opportunity to deliver either relatively large orbital assets with sophisticated remote sensing instrumentation and/or many smaller satellites that could serve a variety of purposes, including development of communications or meteorology networks.

Starship is designed to lift off from its planetary destination and return to Earth, thereby allowing not only the return of crew members but also the return of unprecedented quantities of lunar and Martian samples to Earth for scientific analysis. Because Starship can return tens of tons of payload from the surface of the Moon, the return sample mass of lunar samples from a single mission would dwarf the combined total returned mass of all lunar samples from all sample return missions to date. Many samples with greater sample variety will allow for more scientifically robust analytical studies in laboratories on Earth. Removing the need to severely high-grade and down-select samples on the Moon and Mars will also enable opportunistic science from returned samples to degrees previously not achievable. Never before has the science or exploration community had the potential to send such payload capacity to these destinations and return as much sample material as can be accommodated by Starship. The scientific progress achieved would be unprecedented.

#### Asteroid samples key to planetary defense

**Grove and Powell 20** (Phil Groves, producer of the award-winning documentary *Asteroid Hunters*. Corey Powell, reporter for discover magazine “We're Coming for the Asteroids. Are the Asteroids Coming for Us?” [https://www.discovermagazine.com/the-sciences/were-coming-for-the-asteroids-are-the-asteroids-also-coming-for-us November 30](https://www.discovermagazine.com/the-sciences/were-coming-for-the-asteroids-are-the-asteroids-also-coming-for-us%20November%2030), 2020)DR 22

Groves: The way I internalize that sort of thinking is an ounce of prevention is worth a pound of cure. You have a house. You buy a fire extinguisher, and the expense of that fire extinguisher relative to the overall cost of the house is pretty small. The amount of money that you would have to spend to send up a space telescope to look for asteroids so that we can find it before they find us, is pretty small compared to the overall economy of the world. When you go to sleep at night, you lock your front door. The chances of someone invading your house in the middle of the night is pretty minuscule as well, but you do it. This is the same thing, just on a grander scale.

And it doesn't even cost that much! NASA's budget for finding asteroids is probably less than what it costs to make **one** Hollywood asteroid-disaster movie.

Groves: That might be generous, by the way. NASA's budget for planetary defense in this past year is about 150 million bucks. Just about every Marvel movie made out there cost more than that. And this is the only natural disaster you can actually prevent from happening. You can't cork a volcano. You can't throw a net over a hurricane. You can't glue shut a fault line to stop earthquakes. But this we can stop.

What do you find most scientifically exciting about asteroids?

Groves: The coolest fact that I learned along the way [making Asteroid Hunters] is that the asteroid belt is a planet that never came to be because of this big gravitational bully called Jupiter. It jealously prevented a planet from ever taking shape because of its gravitational influences on planetesimals, which is what asteroids are. They're the leftover materials of construction of the planets of the solar system. The big gap between Mars and Jupiter is because of Jupiter's huge influence. It was the first planet to form, and it's the biggest. It kept things stirred up, gravitationally speaking, in that area, so the asteroids were never given a chance to come together and form a planet.

Then over the four-and-a-half billion years, most of the asteroids have either been sent packing outside of the solar system or sent inward, where they become impactors of the Moon and the Earth, not to mention Venus, Mercury, and Mars. Some also fall into the Sun. The asteroid belt today is maybe 1 percent of what it used to be. All of this stuff, it's a big ammo belt, just being flung outward and inward over the course of the eons.

It's an exciting time in **asteroid exploration**, with Hayabusa2 and OSIRIS-REx bringing asteroid samples back to Earth. Any thoughts **on these missions?**

Groves: They'll help us get an understanding of **the construction** of our solar system and maybe even the formation of life itself. A lot of these asteroids carry with them organic compounds. You want to know: Did they bring water to Earth and Mars and perhaps other planets?

What's also interesting about OSIRIS-REx is the asteroid it's investigating, Bennu, is one of these potentially hazardous asteroids I was referencing earlier. It's going to pass close to Earth in 2035. It's not going to hit then, but Earth's gravity could have some influence on its orbit around the Sun. After that, Bennu may become a real risk to our planet, and it's a pretty big asteroid. It’s about 500 meters across, more than 1,500 feet.

The images of Bennu are amazing. It's a diamond-shaped hunk of gravel.

Groves: It's a rubble pile, and **knowing that is an** important aspect of planetary defense. How you would mitigate the threat could depend on your understanding of the asteroid structure. Is it mostly metallic, like a big cannon ball? Or is it a rubble pile, where if you whack it too hard, it'll break apart? Then you'd have a pile of buckshot, which could be just as bad.

#### Core to deflection—poorly planned deflection makes collision more likely

**Andrews 21** (Robin George Andrews is a volcanologist and science writer based in London. His upcoming book Super Volcanoes: What They Reveal about Earth and the Worlds Beyond will be released in November 2021.“NASA’s DART Mission Could Help Cancel an Asteroid Apocalypse” <https://www.scientificamerican.com/article/nasas-dart-mission-could-help-cancel-an-asteroid-apocalypse/> November 18, 2021)DR 22

Mission planners are reasonably confident that DART’s hushed demise will successfully convey a billiardlike kick to Dimorphos, which seems hefty enough to be sufficiently squeezed by gravity’s clutches. But in the case of a slightly less substantial object, a kinetic impactor could just shoot right through, like a bullet through a cake, blowing it into small but still dangerous chunks. A successful deflection for such threats could require multiple, more gentle impacts rather than a one-and-done wallop.

Another huge unknown is Dimorphos’s appearance. It could be shaped like a potato, a dog bone, a rubber duck, [two bowling balls stuck together](https://www.scientificamerican.com/article/new-horizons-may-have-solved-planet-formation-cold-case/), or something else entirely. A colleague recently gifted Adams a donut-shaped fridge magnet, a wink to how often asteroids surprise scientists once unveiled up close by some deep-space robotic emissary. A near-spherical or even potatolike shape would be optimal for a clean hit, whereas the uneven distribution of mass from more **complex morphologies** would raise the chance of a glancing blow, one that could just “spin up the moonlet and not actually change its orbit,” says Olivier de Weck, a systems engineering researcher at the Massachusetts Institute of Technology.

In the specific and benign case of Dimorphos, all these uncertainties are mostly academic. But in the event of a deflection attempt for a true city-killer, they could prove critical. We could, for instance, **successfully deflect** a potentially hazardous asteroid only to inadvertently put it on a new orbit that makes it more likely to hit Earth in the long run. There are points in space around our planet known as gravitational keyholes, wherein Earth’s pull on the asteroid sets the errant space rock on an assuredly destructive journey. “Once you go through a keyhole, the probability of hitting the Earth is virtually 100 percent,” says de Weck. This, to put it mildly, constitutes a major hurdle for any preemptive strikes against nascent impact threats.

FOREWARNED IS FOREARMED

The emerging calculus is formidable indeed: Protecting ourselves from the most numerous and tricky (and thus most dangerous) space rocks requires more than making shots in the dark, especially when each “shot” is a multimillion-dollar deflection attempt. Ensuring **success** requires first scouting out the threat to learn any given space rock’s exact mass and ability to absorb a weighty impact.

Some of that work [can be done from Earth](https://www.scientificamerican.com/article/are-we-doing-enough-to-protect-earth-from-asteroids/), but as Dimorphos is deviously demonstrating, **tiny objects** are hard targets for remote studies. It is far better—albeit more difficult—to get up close and personal with any adversarial asteroid before trying to hit it at all. This was, in fact, ESA’s original plan, before schedule slips ensured that its reconnaissance spacecraft would arrive only after DART’s dramatic impact. In the future, miniaturized kinetic impactors could even be sent alongside scientific scouting missions, meant to merely nudge target asteroids to estimate how they would respond to more powerful deflective blows. “We have to go and characterize them better **before** we rest humanity’s fate in that one golden shot,” de Weck says.

#### Asteroid collisions cause extinction and nuclear miscalc

Baum 19 (Executive director of the Global Catastrophic Risk Institute, “Risk-Risk Tradeoff Analysis of Nuclear Explosives for Asteroid Deflection,” *Risk Analysis*, vol. 39, no. 11 (November 2019), p.2427-2442)DR 22

The most severe asteroid collisions and nuclear wars can cause global environmental effects. The core mechanism is the transport of particulate matter into the stratosphere, where it can spread worldwide and remain aloft for years or decades. Large asteroid collisions create large quantities of dust and large fireballs; the fire heats the dust so that some portion of it rises into the stratosphere. The largest collisions, such as the 10km Chicxulub impactor, can also eject debris from the collision site into space; upon reentry into the atmosphere, the debris heats up enough to spark global fires (Toon, Zahnle, Morrison, Turco, & Covey, 1997). The fires are a major impact in their own right and can send additional smoke into the stratosphere. For nuclear explosions, there is also a fireball and smoke, in this case from the burning of cities or other military targets.

While in the stratosphere, the particulate matter blocks sunlight and destroys ozone (Toon et al., 2007). The ozone loss increases the amount of ultraviolet radiation reaching the surface, causing skin cancer and other harms (Mills, Toon, Turco, Kinnison, & Garcia, 2008). The blocked sunlight causes abrupt cooling of Earth’s surface and in turn reduced precipitation due to a weakened hydrological cycle. The cool, dry, and dark conditions reduce plant growth. Recent studies use modern climate and crop models to examine the effects for a hypothetical India Pakistan nuclear war scenario with 100 weapons (50 per side) each of 15KT yield. The studies find **ag**riculture declines in the range of approximately 2% to 50% depending on the crop and location.11 Another study compares the crop data to existing poverty and malnourishment and estimates that the crop declines could threaten starvation for two billion people (Helfand, 2013). However, the aforementioned studies do not account for new nuclear explosion fire simulations that find approximately five times less particulate matter reaching the stratosphere, and correspondingly weaker global environmental effects (Reisner et al., 2018). Note also that the 100 weapon scenario used in these studies is not the largest potential scenario. Larger nuclear wars and large asteroid collisions could cause greater harm. The largest asteroid collisions could even **reduce sunlight below the minimum needed for vision** (Toon et al., 1997). Asteroid risk analyses have proposed that the global environmental disruption from large collisions could cause one billion deaths (NRC, 2010) or the death of 25% of all humans (Chapman, 2004; Chapman & Morrison, 1994; Morrison, 1992), though these figures have not been rigorously justified (Baum, 2018a).

The harms from asteroid collisions and nuclear wars can also include important secondary effects. The **food shortages** from severe global environmental disruption could lead to infectious disease outbreaks as public health conditions deteriorate (Helfand, 2013). Law and order could be lost in at least some locations as people struggle for survival (Maher & Baum, 2013). Today’s complex global political-economic system already shows fragility to shocks such as the 2007- 2008 financial crisis (Centeno, Nag, Patterson, Shaver, & Windawi, 2015); an asteroid collision or nuclear war could be an extremely large shock. The systemic consequences of a nuclear war would be further worsened by the likely loss of major world cities that serve as important hubs in the global economy. Even a single detonation in nuclear terrorism would have ripple effects across the global political-economic system (similar to, but likely larger than, the response prompted by the terrorist attacks of 11 September 2001).

It is possible for asteroid collisions to cause nuclear war. An asteroid explosion could be misinterpreted as a **nuclear attack**, prompting nuclear attack that is believed to be retaliation. For example, the 2013 Chelyabinsk event occurred near an important Russian military installation, prompting concerns about the event’s interpretation (Harris et al., 2015)

#### 1AR theory is skewed towards the aff – a) the 2NR must cover substance and over-cover theory, since they get the collapse and persuasive spin advantage of the 3min 2AR, b) their responses to my counter interp will be new, which means 1AR theory necessitates intervention. Implications – a) reject 1AR theory since it can’t be a legitimate check for abuse, b) drop the arg to minimize the chance the round is decided unfairly, c) use reasonability with a bar of defense or the aff always wins since the 2AR can line by line the whole 2NR without winning real abuse

#### Condo’s good – a) prep skew – they’re more familiar with the aff so I need to be able to leverage multiple forms of prep, b) reciprocity – no condo means every perm becomes a no risk issue which creates NIBs to ballot access

#### PICs are good – a) strat skew – they’ve had more time to prep the aff so I need to be able to test it from diff angles, b) they chose to put it in the aff and should be held accountable

### 4

#### Text – The United States should unilaterally restrict asteroid mining done by private entities.

#### Counterplan competes – the Plan is a multilateral agreement while the CP is just the United States.

#### Counterplan solves the Aff – 1] Everyone follows on

**Starling et al. 2021** (Clementine G. Starling, deputy director of Forward Defense and resident fellow of the Transatlantic Security Initiative at the Atlantic Council. she played a leading role in managing NATO’s official public-diplomacy efforts (“NATO Engages”) around the Alliance’s 2019 London Leaders’ Meeting and other summits. Starling was the 2020 Security and Defense fellow at Young Professionals in Foreign Policy (YPFP). Prior to joining the Atlantic Council, Starling worked in the UK Parliament with the House of Commons Defence Select Committee, providing analysis on UK defense, Middle East security, and technology. She graduated with honors from the London School of Economics with a bachelor’s of science in international relations and history. Mark J. Massa, second-year master’s student in the Security Studies Program at the Georgetown University School of Foreign Service. Lt Col Christopher P. Mulder, senior US Air Force fellow in Forward Defense within the Scowcroft Center for Strategy and Security at the Atlantic Council. Prior to his fellowship, Lt Col Mulder served as the 80th Operations Group deputy commander at Sheppard AFB, Texas, responsible for assisting the Operations Group commander in leading operations for the Euro-NATO Joint Jet Pilot Training Program. Julia T. Siegel, member of the Young Global Professionals program with Forward Defense at the Atlantic Council’s Scowcroft Center for Strategy and Security. She graduated with highest distinction from the University of Virginia’s Batten School of Leadership and Public Policy with a bachelor of arts in public policy and leadership and a second major in Spanish. “The Future of Security in Space: A Thirty-Year US Strategy” Report published by the Scowcroft Center for Strategy and Security in the Atlantic Council. <https://www.atlanticcouncil.org/wp-content/uploads/2021/04/TheFutureofSecurityinSpace.pdf>. April 2021)DR 22

The United States should approach the negotiation of the new treaty by **working first** with likeminded nations. It is likely to be significantly easier to come to agreement with traditional US partners and important spacefaring entities like the European Union and Japan. Combined, nations with a view of space security similar to that of the **U**nited **S**tates constitute a large fraction of activity in space.113 Once the United States and likeminded nations set forth an approach, other nations and commercial entities will have incentives to adhere to these rules, **eventually** incentivizing Russia and China **to follow** what will become an international standard. Moreover, this approach is more likely to generate some results in the short term, which would allow the **U**nited **S**tates to see immediate benefits from its investment in space diplomacy.

#### 2] 1AC Wall says the US actions over Mining fractures governance – the CP sets the US in-line.

#### Unilateral Actions solve – they’re legally binding and perceived internationally.

Su 17 Jinyuan, S. U. "Space arms control: Lex lata and currently active proposals." Asian Journal of International Law 7.1 (2017): 61-93. //Elmer

The unilateral statements led by Russia are important confidence-building measures for the security of outer space. However, in international law unilateral acts may also imply binding obligations, subject to the fulfilment of some conditions. The binding character of an international obligation assumed unilaterally, as the customary principle of pacta sunt servanda, is based on good faith. The legal effect of unilateral statements made vis-à-vis the whole world community was addressed by the ICJ in the Nuclear Tests case, in which France committed to cease nuclear tests in the South Pacific. The ICJ expounded: It is well recognized that declarations made by way of unilateral acts, concerning legal or factual situations, may have the effect of creating legal obligations. Declarations of this kind may be, and often are, very specific. When it is the intention of the State making the declaration that it should become bound according to its terms, that intention confers on the declaration the character of a legal undertaking, the State being thenceforth legally required to follow a course of conduct consistent with the declaration. An undertaking of this kind, if given publicly, and with an intent to be bound, even though not made within the context of international negotiations, is binding. In these circumstances, nothing in the nature of a quid pro quo nor any subsequent acceptance of the declaration, nor even any reply or reaction from other States, is required for the declaration to take effect, since such a requirement would be inconsistent with the strictly unilateral nature of the juridical act by which the pronouncement by the State was made.92

#### China uses space coop to bolster perception of credible leadership – that causes space 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.

#### China uses to increase aggression in the SCS.

Yang 18 Adam Yang 3-17-2018 “How Should the US Engage China in Space?” <https://thediplomat.com/2018/03/how-should-the-us-engage-china-in-space> (Major in the U.S. Marine Corp and a student at the Command and Staff College)//Elmer

Subsequently, China is pursuing international cooperation in space – not only for security and economic reasons, but also to bolster the legitimacy of the Chinese Communist Party to domestic and international audiences. The European Space Administration (ESA) has already expressed desires to cooperate with China on human space flight and the use of its future space station. China especially values its relationship with ESA due to the opportunities to trade and transfer technologies denied by the United States. China and Russia have also agreed to cooperate on human space flight and deep space exploration. Though these initiatives are not on the scale of a Maritime Silk Road, they do offer U.S. policymakers opportunities to work with a rising space power for positive ends. Finally, the [US] United States should pay attention to China’s diplomatic and engagement efforts with other nations. Contrary to the cooperative tenets for a Maritime Silk Road, in 2016, China convinced Cambodia to block an Association of South East Asian Nations (ASEAN) joint statement that recognized The Hague’s arbitration ruling on the South China Sea dispute in favor of the Philippines. In June 2017, Vietnam resisted China’s demands to vacate an oil venture within its EEZ, but eventually capitulated when China threatened to use force. The most concerning aspect for Vietnam was an atypical silence from its neighbors – particularly from the Philippines, Indonesia, and Singapore. Apparently, China’s political and economic leverage over these nations prevented them from publicly sympathizing with Vietnam or rebuking China’s actions. Seemingly, when pressed, China uses soft and hard power tactics bilaterally to dislodge multilateral initiatives that counter it interests. Could China disrupt the U.S.-European alliance as it did with ASEAN unity? At this stage, Chinese-European cooperation in space seems well intentioned. Nevertheless, U.S. policymakers should consider whether China’s growing space relations with Europe, Russia, or any other space power could complicate U.S. interests in other areas. As China strengthens its partnerships, its ability to shape laws, institutions and the strategic preferences of others increase as well.

#### Unchecked maritime expansion risks Nuclear War

Thayer and Han 19 (Bradley A. & Lianchao; professor of Political Science at the University of Texas San Antonio, fellow at the Belfer Center for Science and International Affairs at Harvard University; vice president of Citizen Power Initiatives for China, founder of the Independent Federation of Chinese Students and Scholars, legislative counsel and policy director in the US Senate for 12 years; ( 6-12-2019, https://nationalinterest.org/feature/%E2%80%98xi-doctrine%E2%80%99-proclaiming-and-rationalizing-china%E2%80%99s-aggression-62402, "The ‘Xi Doctrine’: Proclaiming and Rationalizing China’s Aggression," National Interest, Acc:9-20-2019 (ermo/sms)

Using the occasion of the Shangri-La Dialogue in Singapore this month, Chinese Minister of National Defense and State Councilor Gen. Wei Fenghe, delivered a sharp message to the United States, which may be termed the “Xi Doctrine” on China’s use of force, after Chinese premier Xi Jinping. Wei declaring both China’s resolve to aggress to advance its interests and a rationalization for the use of force. Wei’s de facto threat of war should not be lost in his nuances, deliberate ambiguity, or in translation. His remarks were so bellicose that the world has noticed, as was certainly intended by the leadership of the Chinese Communist Party (CCP). Empirical evidence of China’s aggression is increasingly common, from its attempt to dominate the South China Sea, the neo-imperialist effort to gain control of states through the Belt and Road Initiative, to its technological imperialism to control 5G and artificial intelligence technologies. What is rather less frequent are statements from high-level Chinese officials proclaiming the country’s intent to be aggressive and offering an attempted legitimizing principle justifying that aggression. While much of the content of Wei’s remarks were in keeping with the gossamer pronouncements on China’s peaceful intentions, as well as a paean to Xi Jinping’s leadership, they still conveyed that China is ready and willing to resort to war if the United States stands in its way of global expansion; and they made clear that China must go to war, or even a nuclear war, to occupy Taiwan. Specifically, there are four elements that comprise the Xi Doctrine and are indications of China’s signaling its willingness to use force. The first component is a new and alarming proclamation of the undisguised threats to use force or wage an unlimited war. China is becoming bolder as its military power grows. This is evidenced in Wei’s muscular remarks on the People’s Republic of China’s approach against Taiwan, his explicit statement that China does not renounce the use of force against Taiwan, and his effort to deter the United States and its allies from intervention should an attack occur. Wei forcefully stated: “If anyone dares to separate Taiwan from China, the Chinese military has no choice but must go to war, and must fight for the reunification of the motherland at all costs.” “At all cost” means that China **will not hesitate** to use nuclear weapons or launching another Pearl Harbor to take over Taiwan. This is a clear warning of an invasion. Second, the Xi Doctrine legitimizes territorial expansion. Through his remarks, Wei sought to convince the rest of the world that China’s seizure of most of the South China Sea is an accomplished fact that cannot be overturned. He made bogus accusations, which included blaming the United States for “raking in profits by stirring up troubles” in the region. He insisted that only ASEAN and China must resolve the issue. He claimed that China’s militarization on South China Sea islands and reefs were an act of self-defense. Should this be allowed to stand, then the Xi Doctrine will set a **perilous precedent** of successful territorial expansion, which will **further entice China** and jeopardize the peace of the region. Third, the doctrine targets the United States as a cause of the world’s major problems and envisions a powerful China evicting the United States from the region. Wei obliquely identified the United States as the cause wars, conflicts, and unrest, and **sought** to convey that the United States will abandon the states of the South China Sea (SCS) when it is confronted by Chinese power, a typical divide and conquer strategy used by the CCP regime. The Xi Doctrine’s fourth element is the mendacity regarding China’s historical use of force and current actions. While the distortions of history were numerous, there were three major lies that should be alarming for the states of the region and the global community. First, Wei said that China had never invaded another country, which is a claim so transparently false it can only be a measure of the contempt he held for the audience. China has a long history of aggression, including against the Tibetans and Vietnamese, and perhaps soon against the Taiwanese. Second, Wei argued that hegemony does not conform to China’s values when, in fact, China proudly was Asia’s hegemon for most of the last two thousand years. Lastly, he claimed that the situation in the SCS is moving toward stability—from China’s perspective this stability is caused by its successful seizure of territory. In fact, the SCS is far less stable as a result of China’s actions. Efforts to counter this grab are denounced by Wei as destabilizing, which is a bit like a thief accusing you of a crime for wanting your property returned. Wei’s belligerent rhetoric is an indication that the CCP regime faces deep external and internal crises. Externally, the Trump administration has shocked the CCP with the three major steps it has taken. First, it has shifted the focus of the U.S. national-security strategy and now identifies China explicitly as its primary rival—abandoning the far more muted policies of previous administrations. Second, Trump has acted on this peer competitive threat by advancing tangible measures, such as arms sales to allies and the ban of Huawei. Third, the administration has made credible commitments to assure partners and allies to counter China’s aggression and bullying. These have unbalanced the CCP regime, and its natural reaction is to bully its way out. Additionally, the CCP regime has perceived that the world today has begun to consider the negative implications of China’s rise, and the United States is determined to prevent what heretofore had been considered China’s unstoppable rise. From the perspective of CCP, conflict is increasingly seen as inevitable and perhaps even imminent. Wei’s bellicosity should be seen in this light, and the PLA is tasked with fighting and winning the war. Internally, Xi’s anti-corruption campaign that selectively targets his political rivalries, and his abandoning the established rules such as term limited of presidency, have introduced deep cleavages into the unity of the regime unity. China’s economic slowdown, made worse by the U.S. trade war, is a fundamental challenge to the regime’s legitimacy. Xi’s repression and suppression of the Chinese people, particularly human-rights defenders, Christians, Kazakhs, Uighurs, and other minorities, have miscarried. Drawing from the pages of unfortunate history, in a classic social-imperialist move, the regime wants to direct these internal tensions outward. At the same time, the nationalistic fervor advanced by the CCP’s propaganda and by the rapid military modernization have made many young militant officers in the PLA overconfident. This is infrequently noticed in the West. They can hardly wait to fight an ultimate war to defeat the arch-enemy. This plainly dangerous mentality echoes the Japanese military’s beliefs before Pearl Harbor.

## Case

### Adv 1

#### Can’t regulate debris – if they don’t fully ban that thumps the aff because mining inherently creates debris – kicking up lunar dust and all of their mining bad cards

#### AT Scoles:

#### 1] The real danger is from NASA’s mission to transplant rocks --- plan doesn’t affect, and there’s other methods of mining, we read blue

Sarah Scoles 15, “Dust from asteroid mining spells danger for satellites,” New Scientist, 5-27-2015, https://www.newscientist.com/article/mg22630235-100-dust-from-asteroid-mining-spells-danger-for-satellites/

NASA chose the second option for its Asteroid Redirect Mission, which aims to pluck a boulder from an asteroid’s surface 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 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). That may not have immediate consequences. But as Earth orbits get more crowded with spent rocket stages and satellites, we will have to worry about cascades of collisions like the one depicted in the movie Gravity. Handmer and Roa want to point out the problem now so that we can find a solution before any satellites get dinged. “It is possible to quantify and manage the risk,” says Handmer. “A few basic precautions will prevent harm due to stray asteroid material.”

#### 2] Collision risk is infinitesimally small

Fange 17 Daniel Von Fange 17, Web Application Engineer, Founder and Owner of LeanCoder, Full Stack, Polyglot Web Developer, “Kessler Syndrome is Over Hyped”, 5/21/2017, http://braino.org/essays/kessler\_syndrome\_is\_over\_hyped/

The orbital area around earth can be broken down into four regions. Low LEO - Up to about 400km. Things that orbit here burn up in the earth’s atmosphere quickly - between a few months to two years. The space station operates at the high end of this range. It loses about a kilometer of altitude a month and if not pushed higher every few months, would soon burn up. For all practical purposes, Low LEO doesn’t matter for Kessler Syndrome. If Low LEO was ever full of space junk, we’d just wait a year and a half, and the problem would be over. High LEO - 400km to 2000km. This where most heavy satellites and most space junk orbits. The air is thin enough here that satellites only go down slowly, and they have a much farther distance to fall. It can take 50 years for stuff here to get down. This is where Kessler Syndrome could be an issue. Mid Orbit - GPS satellites and other navigation satellites travel here in lonely, long lives. The volume of space is so huge, and the number of satellites so few, that we don’t need to worry about Kessler here. GEO - If you put a satellite far enough out from earth, the speed that the satellite travels around the earth will match the speed of the surface of the earth rotating under it. From the ground, the satellite will appear to hang motionless. Usually the geostationary orbit is used by big weather satellites and big TV broadcasting satellites. (This apparent motionlessness is why satellite TV dishes can be mounted pointing in a fixed direction. You can find approximate south just by looking around at the dishes in your northern hemisphere neighborhood.) For Kessler purposes, GEO orbit is roughly a ring 384,400 km around. However, all the satellites here are moving the same direction at the same speed - debris doesn’t get free velocity from the speed of the satellites. Also, it’s quite expensive to get a satellite here, and so there aren’t many, only about one satellite per 1000km of the ring. Kessler is not a problem here. How bad could Kessler Syndrome in High LEO be? Let’s imagine a worst case scenario. An evil alien intelligence chops up everything in High LEO, turning it into 1cm cubes of death orbiting at 1000km, spread as evenly across the surface of this sphere as orbital mechanics would allow. Is humanity cut off from space? I’m guessing the world has launched about 10,000 tons of satellites total. For guessing purposes, I’ll assume 2,500 tons of satellites and junk currently in High LEO. If satellites are made of aluminum, with a density of 2.70 g/cm3, then that’s 839,985,870 1cm cubes. A sphere for an orbit of 1,000km has a surface area of 682,752,000 square KM. So there would be one cube of junk per .81 square KM. If a rocket traveled through that, its odds of hitting that cube are tiny - less than 1 in 10,000.

#### 3] Concedes Asteroid Mining can be regulated to still be allowed to occur – says “possible to … manage risk” – no solvency deficit to the CP.

#### AT McKnight – It’s not talking abt Asteroid Mining – it’s talking about status quo debris from current dust and rockets – inserted the table below – their evidence isn’t predictive, it’s descriptive – means current dust thumps.

McKnight 17 Dr. Darren McKnight 17, Ph.D., Technical Director for Integrity Applications, Previously Senior Vice President and Director of Science and Technology Strategy at Science Applications International Corporation, “Proposed Series of Orbital Debris Remediation Activities,” 3rd International Conference and Exhibition on Satellite & Space Missions, 5/13/2017, https://iaaweb.org/iaa/Scientific%20Activity/debrisminutes03166.pdf [graphics omitted]

Table

Description automatically generated

#### Means D/B – either Squo Debris Thumps or disproves the I/L – past Debris didn’t trigger escalations.

#### Uncertainty from debris collisions creates restraint not instability.

MacDonald 16, B., et al. "Crisis stability in space: China and other challenges." Foreign Policy Institute. Washington, DC (2016). (senior director of the Nonproliferation and Arms Control Project with the Center for Conflict Analysis and Prevention)//Elmer

In any crisis that threatens to escalate into major power conflict, political and military leaders will face uncertainty about the effectiveness of their plans and decisions. This uncertainty will be compounded when potential conflict extends to the space and cyber domains, where weapon effectiveness is largely untested and uncertain, infrastructure interdependencies are unclear, and damaging an adversary could also harm oneself or one’s allies. Unless the stakes become very high, no country will likely want to gamble its well-being in a “single cosmic throw of the dice,” in Harold Brown’s memorable phrase. 96 The novelty of space and cyber warfare, coupled with risk aversion and worst-case assessments, could lead space adversaries into a situation of what can be called “hysteresis,” where each adversary is restrained by its own uncertainty of success. This is conceptually shown in Figures 1 and 2 for offensive counter-space capabilities, though it applies more generally. 97 These graphs portray the hypothetical differences between perceived and actual performance capabilities of offensive counter-space weapons, on a scale from zero to one hundred percent effectiveness. Where uncertainty and risk aversion are absent for two adversaries, no difference would exist between the likely performance of their offensive counter-space assets and their confidence in the performance of those weapons: a simple, straight-line correlation would exist, as in Figure 1. The more interesting, and more realistic, case is notionally presented in Figure 2, which assumes for simplicity that the offensive capabilities of each adversary are comparable. In stark contrast to the case of Figure 1, uncertainty and risk aversion are present and become important factors. Given the high stakes involved in a possible large-scale attack against adversary space assets, a cautious adversary is more likely to be conservative in estimating the effectiveness of its offensive capabilities, while more generously assessing the capabilities of its adversary.

Thus, if both side’s weapons were 50% effective and each side had a similar level of risk aversion, each may conservatively assess its own capabilities to be 30% effective and its adversary’s weapons to be 70% effective. Likewise, if each side’s weapons were 25% effective in reality, each would estimate its own capabilities to be less than 25% effective and its adversary’s to be more than 25% effective, and so on. In Figure 2, this difference appears, in oversimplified fashion, as a gap that represents the realistic worry that a country’s own weapons will under-perform while its adversary’s weapons will over-perform in terms of effectiveness. If both countries face comparable uncertainty and exhibit comparable risk aversion, each may be deterred from initiating an attack by its unwillingness to accept the necessary risks. This gap could represent an “island of stability,” as shown in Figure 2. In essence, given the enormous stakes involved in a major strike against the adversary’s space assets, a potential attacker will likely demonstrate some risk aversion, possessing less confidence in an attack’s effectiveness. It is uncertain how robust this hysteresis may prove to be, but the phenomenon may provide at least some stabilizing influence in a crisis. In the nuclear domain, the immediate, direct consequences of military use, including blast, fire, and direct radiation effects, were appreciated at the outset. Nonetheless, significant uncertainty and under-appreciation persisted with regard to the collateral, indirect, and climatological effects of using such weapons on a large scale. In contrast, the immediate, direct effects of major space conflict are not well understood, and potential indirect and interdependent effects are even less understood. Indirect effects of large-scale space and cyber warfare would be virtually impossible to confidently calculate, as the infrastructures such warfare would affect are constantly changing in design and technology. Added to this is a likely anxiety that if an attack were less successful than planned, a highly aggrieved and powerful adversary could retaliate in unanticipated ways, possibly with highly destructive consequences. As a result, two adversaries facing potential conflict may lack confidence both in the potential effectiveness of their own attacks and in the ineffectiveness of any subsequent retaliation. Such mutual uncertainty would ultimately be stabilizing, though probably not particularly robust. This is reflected in Figure 2, where each side shows more caution than the technical effectiveness of its systems may suggest. Each curve notionally represents one state’s confidence in its offensive counter-space effectiveness relative to their actual effectiveness. Until true space asset resilience becomes a trusted feature of space architectures, deterrence by risk aversion, and cross-domain deterrence, may be the only means for deterrence to function in space.

#### No Escalation over Satellites:

#### 1] Planning Priorities

Bowen 18 Bleddyn Bowen 2-20-2018 “The Art of Space Deterrence” <https://www.europeanleadershipnetwork.org/commentary/the-art-of-space-deterrence/> (Lecturer in International Relations at the University of Leicester)//Elmer

Space is often an afterthought or a miscellaneous ancillary in the grand strategic views of top-level decision-makers. A president may not care that one satellite may be lost or go dark; it may cause panic and Twitter-based hysteria for the space community, of course. But the terrestrial context and consequences, as well as the political stakes and symbolism of any exchange of hostilities in space matters more. The political and media dimension can magnify or minimise the perceived consequences of losing specific satellites out of all proportion to their actual strategic effect.

#### AT Xu:

#### 1] This card comes nowhere close to a space war argument – it says “conflicts” i.e. disputes, NOT a full on war. Just because they put WMD’s, doesn’t get them to space war – give them zero spin.

#### 2] MAD checks space escalation – nuclear response and debris

Bowen 18 [Bleddyn Bowen, Lecturer in International Relations at the University of Leicester. The Art of Space Deterrence. February 20, 2018. https://www.europeanleadershipnetwork.org/commentary/the-art-of-space-deterrence/]

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.

#### 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 heterogeneou

s (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

#### They do not solve multilateral governance – the aff fiats that states restrict mining but it does NOT fiat that they do so together – that would be extra T which is bad

#### Wall is about negotiations through the UN which is not the aff – hold them to the text of the plan – lines inserted

Mike Wall 20, Senior Space Writer, “US policy could thwart sustainable space development, researchers say,” Space, 10-8-2020, https://www.space.com/us-space-policy-mining-artemis-accords

The United States' space policy threatens the safe and sustainable development of the final frontier, two researchers argue. The U.S. is pushing national rather than multilateral regulation of space mining, an approach that could have serious negative consequences, astronomer Aaron Boley and political scientist Michael Byers, both of the University of British Columbia in Vancouver, write in a "Policy Forum" piece that was published online today (Oct. 8) in the journal Science. Boley and Byers cite the 2015 passage of the Commercial Space Launch Competitiveness Act, which explicitly granted American companies and citizens the right to mine and sell space resources. That right was affirmed this past April in an executive order signed by President Donald Trump, they note. The researchers also point to NASA's announcement last month that it intends to buy moon dirt and soil collected by private companies, and its plan to sign bilateral agreements with international partners that want to participate in the agency's Artemis program of crewed lunar exploration. Artemis, one of NASA's highest-profile projects, aims to return astronauts to the moon in 2024 and establish a long-term, sustainable human presence on and around Earth's nearest neighbor by the end of the decade. Making all of this happen will require the extensive use of lunar resources, such as the water ice that lurks on the permanently shadowed floors of polar craters, NASA officials have said. Boley and Byers take special aim at the planned bilateral agreements, known as the Artemis Accords. In promoting them, the U.S. "is overlooking best practice with regard to the sustainable development of space," the researchers write. "Instead of pressing ahead unilaterally and bilaterally, the United States should support negotiations on space mining within the UN [United Nations] Committee on the Peaceful Uses of Outer Space, the same multilateral body that drafted the five major space treaties of the 1960s and '70s," they write in the Science piece. (The most important of the five is the 1967 Outer Space Treaty, which forms the basis of international space law.) "Meanwhile, NASA’s actions must be seen for what they are — a concerted, strategic effort to redirect international space cooperation in favor of short-term U.S. commercial interests, with little regard for the risks involved," Boley and Byers add. The researchers worry that the U.S. is setting an unfortunate precedent for other countries to follow, and that space mining and other exploration activities may therefore proceed in a somewhat careless and chaotic fashion in the not-too-distant future. "That's kind of our worst-case scenario — that you have all of these different national regulations, and they can vary greatly, they allow for 'flag of convenience,' they cause disregard of the environment, large-scale pollution of orbital environments, of the surface of the moon in terms of waste materials and so forth," Boley told Space.com. "That's what we're worried about." He cited the growing space-junk problem as a cautionary tale. For decades, spacefaring nations have been licensing launches internally, without much international coordination, cooperation or long-term planning. In recent years, low-Earth orbit has become crowded enough with satellites and hunks of debris that collisions are a real concern. For example, the International Space Station has had to maneuver itself away from potential impacts three times so far in 2020 alone.

#### Pelton is not at all reverse causal – it says space agreements are PART of addressing a litany of existential threats, not that space governance is sufficient to solve climate change, AI, terrorism or any other disaster in their laundry list – read it if you don’t believe us.

#### Their solvency card is about the creation of a NEW BODY which the aff BETTER NOT DO and it doesn’t even say that we should restrict mining

Morgan Saletta 16, PhD, History and Philosophy of Science, The University of Melbourne, “All of humanity should share in the space mining boom,” Conversation, 4-17-2016, https://theconversation.com/all-of-humanity-should-share-in-the-space-mining-boom-57740

One solitary asteroid might be worth trillions of dollars in platinum and other metals. Exploiting these resources could lead to a global boom in wealth, which could raise living standards worldwide and potentially benefit all of humanity. There are already companies, such as Planetary Resources, hoping to make mining in space a reality. Peter Diamondis, co-founder of Planetary Resources and founder of the XPrize Grand Challenges, believes that the benefits to humanity give us a moral imperative to explore and utilise space. He has also declared “there are twenty-trillion-dollar checks up there, waiting to be cashed!” However, behind the utopian rhetoric and dazzling dreams of riches lie some very real problems. Ownership and the Outer Space Treaty The framework of international space law is given by the Outer Space Treaty (OST), which entered into force in 1967. Among its main principals, the OST includes these statements: the exploration and use of outer space shall be carried out for the benefit and in the interests of all countries and shall be the province of all mankind and, outer space is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means Because the OST is generally interpreted as preventing anything like private fee-simple ownership, it is sometimes claimed to be an obstacle to commercial ventures in space. But such claims simply do not hold water. There are numerous terrestrial examples where resources are profitably exploited in the absence of fee-simple ownership. Governments routinely licence companies to engage in timber extraction, mining, offshore oil exploration and other activities, receiving royalties payments on production. In the United States, revenues from such royalties totalled some US$13.5 billion dollars in 2014 from federally owned or managed lands alone. Nevertheless, some proponents of mining in outer space argue for serious modification or an end to the Outer Space Treaty and claim, against the evidence, that without fee-simple ownership, there is no incentive for commercial exploitation. The Unites States’ Space Act of 2015 was just one volley – and a deliberately vague one at that – in this ongoing international debate. A balanced approach? The riches exist, but how will humanity benefit from mining in outer space, or for that matter, other global commons such as the deep sea floor? Behind the lofty rhetoric of benefits to humanity, there is a dark shadow of voodoo economics, the shambling, walking dead figure of trickle down economics– and the possibility of a world where a few trillionaires enjoy the view from space while others barely eke a living on its surface. Yet we do suggest that commercial interests and profit seeking can be a healthy part of the exploration of outer space. Yet outer space is not the Wild West frontier of Frederick Jackson Turner, nor do we live in the Gold Rush days of Jack London’s tale of greed and death. In the common heritage of space, with multiple state and private actors engaging in exploration and potentially exploitation, international cooperation and oversight will benefit all. The Alaskan model There is a balanced, pragmatic approach that will promote commercial and profit driven activities, while also producing tangible benefits to all of humanity. Importantly, this pragmatic approach has a well established precedent that has existed for nearly 40 years. And this comes not from a social democracy or left-wing ideology, but was the brainchild of a libertarian, Republican governor of Alaska, Jay Hammond. That model is the Alaska Permanent Fund Corporation (APFC) created in 1976, and its unique “citizen’s dividend”. The APF is a resource wealth fund, which derives its revenue primarily from leases on oil fields. In 1977, Hammond suggested that “rather than permitting government to spend all public monies earned through the exploitation of the public’s resources for what government thinks best, let’s grant shares to Alaskans.” The first dividend payment was made in 1982, and in 2015 that payment amounted to US$2,072. Linking a citizen’s dividend to a sovereign wealth fund was unique, but the idea of a citizen’s dividend has a long and venerable tradition. One of the earliest advocates was no less than the political theorist and American Revolutionary, Thomas Paine. International body How would this work for outer space? We need an international body similar to the International Seabed Authority, which was established by the United Nations Convention on the Law of the Sea, or the International Telecommunications Union, which allocates satellite orbits. This would provide the stable business and investment environment that entrepreneurs seek by ensuring international law and obligations are met. This body could license outer space resources and levy a royalty on production, which is part of standard business practice between petroleum and other mining companies and governments here on Earth. In turn, these revenues, or a significant portion thereof, would be deposited in a Space Resource Fund, possibly under the aegis of the World Bank. And every single citizen on Earth, say aged 18 or above, would receive a dividend on a yearly basis as their rightful share as owners of the common province of humankind. Crucially, we are not suggesting redistribution, which has been an obstacle to the International Seabed Authority and the Moon Treaty in the past, but a fair share dividend of wealth that truly belongs to everyone. Our model doesn’t provide a handout, or a welfare cheque, or charity from a trillionaire philanthopist; it pays every owner in a global commons a share of what is rightfully theirs. Even tiny dividends by the standards of the world’s wealthy nations would make a difference for some developing world farmers. If there truly are trillions of dollars out there, then this might be something fundamentally world changing. We accept that Larry Page and Sir Richard Branson – founding investors and advisors in Planetary Resources – and its founders Eric Anderson and Peter Diamandis, truly want humanity to benefit from outer space, and that they truly believe in corporate social responsibility and a sustainable future. We would encourage them to embrace the idea that the sky really does belong to all of us, as the common “province of all mankind”. By paying rent for the right to exploit resources in space and royalties on production, the same way oil companies pay to exploit oil in the Gulf of Mexico, they’ll be engaging in business as usual. They will have bought the right to make a potentially enormous profit and prove they really are responsible global citizens. And they’d get a citizen’s dividend cheque too.

#### AT Borgwardt – 1] They haven’t read Brink U/Q that Nuke Terror is happening/possible and 2] This assumes a Trump administration lash-out to Nuke Terror