### 1AC---Advantage

#### Contention one is mining.

#### Space mining coming now – lack of regulations makes conflicts likely.

Zeisl 19 [Yasemin Zeisl, MSc in International Relations and Affairs from the London School of Economics and Political Science (LSE), “Three Salient Risks of Mining in Space,” 05/03/19, *GlobalRiskIntel*, https://www.globalriskintel.com/insights/three-salient-risks-mining-space, EA]

The harvesting of natural resources from space objects is the goal of numerous companies such as Planetary Resources or Deep Space Industries in the United States, Asteroid Mining Corporation in Scotland, or iSpace in Japan. While some companies such as iSpace are focusing on resources inside the Moon, others are developing strategies to identify and extract resources from asteroids and extinct comets. Given that calculations evaluate space mining as a highly lucrative business with potential profits amounting to trillions in U.S.-dollars, it is unsurprising that investment into space mining rose from 534 million USD in 2014 to 3.1 billion USD in 2018.

Research institutions such as the Center for Near-Earth Object Studies (CNEOS) — which cooperates with the National Aeronautics and Space Administration (NASA) — detects, traces, and assesses risks of objects moving close to the Earth. Such calculations are relevant for future ventures into space mining, which will focus on metals such as platinum, gold, iron, rhodium, zinc, cobalt, and nickel, as well as water and carbon found in asteroids and extinct comets. Celestial ice would be particularly useful for generating rocket fuel by splitting it into hydrogen and oxygen. This may facilitate long space travel to destinations such as Mars. The usage of extinct comets as gas stations may bring engineers and scientists one step closer to the goal of colonizing Mars. While rocket fuel extraction may be a relatively feasible project for the near future, it is expected that harvesting metals from space may require several more decades to realize.

Spotting the potential profitability of space mining, the United States passed the Commercial Space Launch Competitiveness Act in 2015 to grant U.S. citizens the right to harvest natural resources from celestial bodies. Similarly, Luxembourg established a space mining law and provided investment opportunities in August 2017. In January 2019, Russia started negotiating a bilateral cooperation arrangement with Luxembourg.

The fact that there is no clearly defined international treaty on space mining poses a major risk. Although the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies of 1984 may provide some detail on the issue by asserting that no state, organization, or natural person can lay claim to any object in space, the fact that only 18 countries have committed to this multilateral treaty leaves the majority of states unbound by this regulation. An inconsistent legal landscape in regard to resource extraction of celestial bodies could lead to legal clashes between different countries and potential disadvantages for companies or organizations from certain countries. Mining in space could turn into a fierce competition among various private businesses and states. Therefore, licensing regulations will also have to be clearly defined. Licenses will help to clarify both ownership of yields and the relationships among miners, investors, and governments in order to avoid conflict in the future.

#### Scenario one is debris.

#### Two internal links to space wars:

#### 1 – Private mining ventures cause resource wars – empirics prove.

Kelvey 14 [Jon Kelvey, writer and journalist based in central Maryland. Is It Legal to Mine Asteroids?,” 10/13/14, *Slate*, https://slate.com/technology/2014/10/asteroid-mining-and-space-law-who-gets-to-profit-from-outer-space-platinum.html]

If these mining ventures are successful, the world could see billions of dollars flowing down from space to American companies. Is there a system for dealing with any conflicts that asteroid mining will likely arouse? The historical record certainly suggests the possibility of bitter, even violent disputes.

Just consider the Arctic. Impenetrable ice was once the foil for those who dreamed of a Northwest Passage, but global warming has made the oil- and natural-gas-rich Arctic seabed accessible for the first time, and there has been a rush to lay claims to territory. The United States and Canada have been making careful geological measurements in order to determine territorial boundaries. Russia has pursued a different path: In 2007, the country used a submersible to plant its flag on the seabed at the North Pole. It’s an example of how contested things can get even when there is a system of rules in place, according to Joanne Gabrynowicz, a space lawyer and editor emeritus of the Journal of Space Law at the University of Mississippi School of Law. There is a system of international governance in place for the Arctic, but she says it is being strained by the recent thaw because, “it’s so much easier to govern something when you can’t get to it.”

If emerging space technologies can be thought of as melting Arctic ice, it might be time to start discussing some basic rules before everything thaws.

#### Specifically, confusion over space property undermines peace.

Renstrom 15 [Joelle Renstrom, Lecturer of Rhetoric at Boston University, “Will Mining Celestial Bodies Ruin Space?,” 12/09/15, WBUR, https://www.wbur.org/cognoscenti/2015/12/09/asteroid-mining-joelle-renstrom, EA]

We could certainly use these resources on Earth — especially water, if catastrophic drought predictions are accurate. Of course, asteroid mining companies that sell water to the rest of the world would need to be regulated, but that’s not really a new proposition. As with oil and gas companies, extracting, processing and selling water could promote worldwide competition and boost the economy. But how, exactly, would that competition work?

Planetary Resources might be the first asteroid mining company, but it won’t be the last. Once the technology and resources are in place, other companies from the U.S. and elsewhere will join them in the hunt for viable, resource-rich asteroids. And then what?

Earth has a history of oil crises, embargoes and conflicts. What’s to prevent similar clashes from arising in space?

Perhaps enough asteroids exist to keep companies from various countries out of each other’s way if they can’t share. But the situation could get tricky, especially because the asteroids themselves would remain sovereign territory, as dictated by the 1967 Outer Space Treaty. The new law makes clear its consistency with this Treaty: “the United States does not thereby assert sovereignty or sovereign or exclusive rights or jurisdiction over, or the ownership of, any celestial body.”

So no one would own the asteroids, but people would own the spoils. Would other countries recognize that? Would we recognize it if a Chinese or Russian company found a stockpile of platinum on an asteroid? Would asteroid mining become a first-come, first-served proposition?

The Asteroid Resources Property Act also paves the way for resource exploitation on planets, such as Mars. One of the primary arguments made for colonizing the Red Planet is its resources. Mars Society founder and colonization advocate Robert Zubrin argues that Mars “is endowed with all the resources needed to support not only life but the actual development of a technological civilization.” These resources include water, carbon, nitrogen, hydrogen, oxygen and deuterium, a rare (on Earth) and valuable hydrogen isotope used to make rocket fuel. As such endeavors become more feasible, their implications raise some slippery-slope fears -- namely, that in addition to lifeless asteroids, planets with the potential for microbial life such as Mars may become competitive mining stations.

#### That turns good mining – only reclassifying space property solves.

Yan 18 [Laura Yan, citing Ramin Skibba, an astrophysicist, ”Should We Really Be Mining in Space?,” 05/05/18, *Popular Mechanics*, https://www.popularmechanics.com/space/a20195040/should-we-be-really-be-mining-in-space/]

Imagine, for instance, an asteroid that contains as many platinum-group metals as all reserves on Earth. Businesses will compete for the precious resource, and the competing may soon turn into battle by armed satellites, which can lead back to conflicts on Earth. The act of mining itself could also be dangerous: if space-mining break up asteroids, it could harm other satellites, spacecrafts and astronauts.

Commerical space mining could lead to conflicts between profitability and public interest. "Once you’re on board with the commercial space industry, then you as a researcher must accept, if not support, everything that comes with it," Skibba writes. "To succeed, these businesses will seek profitable missions, while science, exploration, and discovery—goals that stimulate public interest—will inevitably have lower priority,"

The solution, according to Skibba, is to treat outer space as we do Antarctica: a place to encourage scientific investigation and discourage territorial claims. It's a commendable idea, but is it likely? Last week, President Trump has already suggested the idea of adding a "Space Force" to the military. According to The Independent, "experts have warned that space will be increasingly contested in years to come, as increasingly complex weapons are built and more opportunities are opened up for exploring the area outside the Earth."

#### 2 – Redirection – private asteroid mining causes proliferation of NEO redirection capabilities – accidents and terrorism cause extinction.

Drmola 15 [Jakub Drmola and Miroslav Mareš, \* PhD Security Studies, International Relations and Political Science at Masaryk University, \*\* Professor, at the Division of Security and Strategic Studies, Masaryk University, “Revisiting the deflection dilemma,” 2015, *Astronomy & Geophysics*, Vol. 56, Issue 5, pp. 5.15-5.18, https://academic.oup.com/astrogeo/article/56/5/5.15/235650, EA]

These authors presented a stark dilemma. We now know that the planet Earth orbits our Sun among thousands of other objects of varying sizes and trajectories. So far, well over 12 000 near-Earth objects (NEOs) have been discovered. Such objects are known to have collided with the Earth in the past and are certain to hit it in the future, with potentially catastrophic results. All the known rocky planets and moons are dotted with impact craters (with the notable exception of Jupiter's geologically hyperactive moon Io). Even the surface of the Earth, despite all its weathering, erosion, volcanic activity and cover of the biosphere, bears clear marks of past impacts, with dozens of craters of more than 10 km in diameter still discernible today. It is a dangerous neighbourhood that we live in – sometimes described as a shooting gallery.

The role of the Chicxulub impactor in the Cretaceous–Paleogene mass extinction event some 65 million years ago helps to make the severity of this point fairly apparent. Direct observations of events such as the jovian impact of the Shoemaker-Levy 9 comet in July 1994 further emphasized that we live in an active solar system and large collisions are not a thing of the past. The recent Chelyabinsk bolide (or the less recent but somewhat larger Tunguska airburst) remind us that Jupiter is not the only planet that can be hit by sizable objects (Chapman 2004).

The Shoemaker-Levy 9 collision made its mark not only in Jupiter's upper atmosphere, where it left blotches the size of our entire planet, but it also shook our perceptions and served as an inspiration for Hollywood films as well as for “planetary defence” concepts – often calling on nuclear weapons to break up the object or deflect it away from the Earth. The 2013 deluge of videos, injuries and damage reports from Chelyabinsk reinvigorated interest.

Sooner or later, in order to avoid the fate of the dinosaurs, humanity needs to develop scientific and technological capabilities to prevent extinction-level impact events. But most solutions bring about new challenges, because new technologies rarely have only one application. Here lies the dilemma: any technology allowing us to deflect asteroids from a collision trajectory with the Earth could also be used to direct them towards the Earth. This means we could potentially turn any future near-miss into an impact, with all its devastating consequences.

Sagan & Ostro (1994b) concluded that this is a risk not worth taking. Considering the very low probabilities of impacts with objects larger than 1 km (generally less than 1 in 5000 for a given century), they were more worried about the misuse of such trajectory-altering technology than the undiverted asteroids themselves. Humans visited a great deal of violence upon each other during the 20th century; war has been prevalent and increasingly technological. The beginning of the 21st century does not seem overly promising either. The risk that one of humanity's irrational totalitarian powers decides to have some nearby asteroid steered towards Earth might simply be too high. Many people still see the default cosmic odds as preferable to the lessons of recent history.

Later on, a modification of sorts to the deflection dilemma appeared, positing that the “real” dilemma (Schweickart 2004, Morrison 2010) lies in putting various parts of the Earth and its population in harm's way during a deflection attempt. Inevitably, any mission to deflect an object that is on a collision course with the Earth will involve moving its supposed point of impact across the surface until it misses the planet entirely. Should such a deflection attempt fail to modify the trajectory sufficiently, the impact would still occur, albeit in a different area. This could expose to risk countries that were not originally threatened by the asteroid (depending on its size and path), while diminishing the risk to those living near the original point of impact. The damage and casualties around this new and modified point of impact would then, to some extent, be caused by those who tried but failed to deflect the asteroid. The repercussions of such an event would certainly be grave.

Privatization and industry

Both of these versions of the deflection dilemma are essentially state-centric and neither presumes that this technology might be wielded by private companies and non-state actors. But the current trend of greater involvement of private companies in space suggests that states might be unable (or unwilling) to maintain their exclusive hold on the advanced space technologies. The private sector is currently hot on the heels of national and international space agencies in exploring feasible and economically viable options. At the moment, private companies are already in the business (or at least in the process of making it a profitable business) of resupplying the International Space Station, taking tourists to the edge of space and operating communication satellites. And, recently, a new area of potential commercialization of space, asteroid mining, has received increased attention and investment. It has already spawned private companies (such as Deep Space Industries and Planetary Resources, Inc.); this industry is highly relevant to the deflection dilemma (Ostro 1999).

While the idea of mining asteroids carries with it an air of science fiction (as all space-based endeavours do, at some stage), it is based on science fact. One of the most significant facts on which to base a space mining industry is the apparent abundance of highly valued raw materials in asteroids. Platinum, rhodium and other precious metals are extremely useful because of their catalytic and electrical properties, but are also exceedingly rare in the Earth's crust. While such metals sank deep into the planet during core formation, asteroids retained their original composition and even delivered much of the accessible reserves to our planet in the form of meteorite bombardment (Willbold et al. 2011). Some of the largest known deposits of these metals on Earth are found within ancient impact craters.

Platinum-group metals are deemed critical to our modern technology-based civilization, without substitutes in many applications, and their supply is at risk of “geopolitical machinations” (Graedel 2013). The combination of natural scarcity and industrial demand leads to their high price, which easily rivals that of gold. Because space missions are inherently expensive, these precious metals are prime high-value candidates for economically viable asteroid mining. Since the projected market value of these metals within an asteroid is in the order of billions or even hundreds of billions of US dollars (depending on the size of the asteroid), the success of the industry comes down to developing technically feasible and cost-effective methods of mining them and retrieving them (Blair 2000, Gerlach 2005).

The other interesting and potentially worthwhile resource we could harvest from asteroids is water. Not only is liquid water required by astronauts to survive, but it can also be broken down into oxygen and hydrogen to be used as fuel. And, while water is abundant and cheap here on Earth, it is very expensive to transport it to orbit. It costs $3000–$10 000 per kilogramme to launch water (or anything else) to low Earth orbit and about two or three times more for geostationary transfer orbit (Jain & Trost 2013). It is not the prospect of procuring something we covet here on the surface of the Earth that makes this venture attractive, but rather the idea of not having to wage an expensive battle with Earth's gravity each time we want to make use of something as mundane as water in space.

If the costs associated with mining water from asteroids can be brought below the cost of launching water from Earth, this seemingly counter-intuitive industry might take off and become profitable. Additionally, through the use of some form of refuelling depots, it would probably in turn make space endeavours more affordable and sustainable. The same would apply if some of the more common metals found in asteroids (such as iron or nickel) were used to build structures directly in orbit instead of launching them from the Earth.

The risks of mining asteroids

There are two basic ways to go about moving the resources contained within a given asteroid to the Earth. They can be extracted from the asteroid during its natural orbit and then transported to the Earth, or the entire asteroid might be moved closer to a more convenient location before starting mining. Thus repositioned, it might even be used as a shielded habitat, once hollowed out (Ostro 1999). There are different speculative costs and benefits associated with either option, which would vary with the size, orbit and composition of the asteroid. But, crucially, the second option would entail putting asteroids into orbit around the Earth, the Moon or possibly at one of the Earth's Lagrangian points. Indeed, NASA has already planned a mission to capture a small asteroid and place it in a high cislunar orbit, where it would serve as a destination for future manned missions and experiments. This “Asteroid Redirect Mission” is to take place in the next decade and is being pitched mainly as a stepping stone towards a future mission to Mars (see box “NASA's Asteroid Redirect Mission”; Brophy et al. 2012, Burchell 2014, Gates et al. 2015).

Programmes to redirect asteroids and, especially, plans to mine asteroids on an industrial scale essentially resurrect the deflection dilemma. But it is no longer a matter of superpowers intentionally misusing technology designed to prevent dangerous impacts. It becomes an issue of proliferation among private entities. Once private mining companies acquire the technical ability to redirect suitable NEOs (Baoyin et al. 2011) in order to extract platinum or water from them, perilous inflections become more likely.

The probability of accidents will rise with the number of asteroids whose trajectories we decide to manipulate. Such accidents might be very unlikely, but even a tiny technical or human error in the execution of an inflection meant to place an asteroid into the lunar or geocentric orbit might send it crashing into the Earth with potentially devastating consequences. And while we might find solace in the low probabilities associated with such an accident, even contemporary industries which are considered very safe suffer from unlikely tragedies. Despite being dependable and reliable, airliners do crash; there are a lot of them flying and very improbable accidents do happen if the dice are rolled often enough. Undoubtedly, we will not be steering as many asteroids as we steer planes any time soon, but industries tend to be more accident-prone during their infancy. Furthermore, a single asteroid can do a lot more damage than a single plane. And who is to say how much metal or water we are going to need in space over the course of the 21st century, or the next?

The second source of risk is the intentional misuse, similar to the original deflection dilemma. But the entry barrier for asteroid weaponization gets much lower if mining them and moving them around becomes a common industrial activity. This is in stark contrast to the original scenario which envisioned this technology to be used solely for planetary defence and under control of a very small number of the most powerful countries (Morrison 2010). If such a powerful technology becomes widely and commercially available, even rogue states and well-funded terrorist groups might be tempted to use it for an unexpected and devastating attack. In addition, an active asteroid mining industry would make it more difficult to detect any hostile inflection attempts among the number of legitimate and benign ones.

#### Even smaller asteroids cause debris cascades hitting satellites.

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

IF THE gold mine is too far from home, why not move it nearby? It sounds like a fantasy, but would-be miners are already dreaming up ways to drag resource-rich space rocks closer to home. Trouble is, that could threaten the web of satellites around Earth.

Asteroids are not only stepping stones for cosmic colonisation, but may contain metals like gold, platinum, iron and titanium, plus life-sustaining hydrogen and oxygen, and rocket-fuelling ammonia. Space age forty-niners can either try to work an asteroid where it is, or tug it into a more convenient orbit.

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.

#### Space wars trigger nuclear war – kills MAD.

Johnson 14 [Les Johnson is a NASA technologist and science writer. Living without Satellites. 2014. https://www.baen.com/living\_without\_satellites]

No matter the cause, once the cascade of collisions begins, the result may be the same: a debris cloud of increasing size will encircle the globe. The cloud will consist of thousands of debris objects, each traveling at over five miles per second. These objects will circle the globe every ninety minutes and on every orbit, each piece will have a small, but very real, probability of colliding with a functioning spacecraft. When these inevitable secondary collisions occur, more debris will be added to the cloud, increasing yet again the probability of future collisions. Like a nuclear chain reaction, the cascade of collisions will continue until the count of debris objects numbers in the millions. There are now nearly half a million pieces of debris with diameters of a few centimeters or more. Most of these objects are in orbits too high for them to naturally decay, enter the Earth’s atmosphere, and burn up. Once the cascade begins and the tipping point is crossed, no satellite will be completely safe. Is this inevitable? No. But unless we begin to take steps to clean up the existing debris, limit the creation of future debris, and harden our commercial satellites against extreme solar storms, then this frightening scenario may become a reality.

Some may be wondering why I call this scenario “frightening.” After all, space is out there and we’re down here. How can the loss of space satellites, things that didn’t exist in any significant number until the 1960s, possibly have any meaningful impact on our lives here on Earth? Most people don’t realize how their lives are affected by space technology and space satellites. When they think of space exploration, they think of the International Space Station, Apollo and sending people to Mars. What they should also be thinking about are the Global Positioning System (GPS), communications satellites, spy satellites and weather forecasting – among many other things.

GPS was developed first and foremost to support the needs of the U.S. military. It consists of a network of between 24 – 32 satellites that provide line-of-sight access for receivers on the ground from virtually any place on planet Earth. A receiver uses the signals from multiple satellites simultaneously, and the amount of time it took each signal to reach it (knowing that the signal travels at the speed of light), to calculate its position on the ground with very high accuracy. Since the early 1990s, GPS has allowed our armed forces to navigate and coordinate with precision unequaled in the history of warfare. GPS signals are used to navigate drones for reconnaissance and combat, soldiers on battlefields, ships at sea, and planes in the air. GPS allows precise navigation anywhere on the globe and under varied weather conditions including rain, fog and sand storms. A sudden loss of GPS for the modern warfighter would be akin to someone losing one of their primary senses – sight, sound, smell or touch. It would not necessarily be fatal, but it would certainly be debilitating.

It is so useful that other countries are building their own systems so as to not be dependent upon the US should we decide to turn off GPS signals. After all, if we can use it, so can our adversaries. The Global Navigation Satellite System (GLONASS) is Russia’s answer to GPS. Europe is building and deploying their Galileo positioning system and countries like India and China are building their own regional systems to provide comparable capability under their own control. Who can blame them?

Shortly after becoming operational, GPS entered the civilian economy like a tidal wave. Commercial electronics companies began selling portable GPS receivers for cars and trucks. Cell phone manufactures now have them embedded in virtually every cell phone produced. Google Maps changed the nature of mapping and how we travel, both in our cars and on foot. Local emergency personnel adopted the technology for E-911 services and for navigation. Cities have mapped the locations of fire hydrants and can direct emergency responders to the nearest one should the need arise.

Have you ever heard of Positive Train Control? In 2008, the U.S. Congress mandated that the nation’s rail system use GPS tracking to improve safety and reduce the risk of accidental collisions. Our rail system, which moves goods across the continent, is now dependent on GPS to function. And, as goes the rail system, so go the airlines. By 2025, U.S. air traffic control will move from ground-based beacons to space-based GPS tracking and navigation. Touted to increase the efficiency of air travel, with ever-increasing number of commercial airline flights, the Next Generation Air Transportation System will also be dependent upon satellites for routing planes and handling the complex traffic control near the nation’s airports.

Ships at sea already use GPS for navigation, with the thousands of cargo ships carrying everything from cars and electronics to food and diapers moving from country to country as international trade becomes increasingly globalized. Few countries make all the goods their citizens need within their own borders and GPS is one of the technologies that helped make massive international trade affordable.

The retail industry has embraced GPS for moving goods in a timely manner from warehouses to store shelves. Knowing where a particular shipment is located on its journey allows just in time manufacturing and inventory control, reducing costs and warehousing expenses. Retail companies also makes use of satellite technology in other ways. Credit card companies often use secure satellite links for card and check approvals at retail stores, bypassing the increasingly insecure Internet for transmitting financial data. The satellite dishes on the roofs of your favorite stores are not there for employees to watch DirecTV in the break room. They are likely VSAT (Very Small Aperture Terminal) antennas that are humming with the financial and inventory data needed for the store to keep its doors open and its shelves stocked. Some banks now use VSATs to transfer funds from one to the other, making them a part of the global financial infrastructure.

Cable television doesn’t originate at your local cable company and then get piped into your home. Instead, the myriad of channels conveniently aggregated into whatever bundle to which you happen to subscribe come to your local cable provider by satellite relay. Without satellites, news of what’s happening in Russia, China and other parts of the globe cannot otherwise make it into the daily newsfeed. Your favorite football team playing a game in another state this Monday night likely cannot be broadcast without going through a satellite relay. If our communications satellites are lost, your televisions and, to the extent that they play to a national audience, your radios, will become purveyors of only what’s happening locally.

We shouldn’t forget weather forecasting. A network of satellites provides critical data for forecasting the weather, particularly the outlook for several days in the future. Figure 2 shows a satellite image of Hurricane Ivan approaching Alabama’s gulf coast in 2004. This type of data saves lives and, almost as importantly, helps people and businesses determine if they are in the path of a storm and how to react appropriately. The vantage point of space allows the precise evacuation of the communities likely to be most affected and those that are not in the line of fire to know that they can remain in place, saving lives and millions of dollars.

Satellite imagery is used by the military and our political leaders to maintain the peace. When your potential adversaries can’t hide what they’re doing, where their armies are moving and what they are doing with their civilian and military infrastructure, then the danger of surprise attack is diminished. In our nuclear age with instant death only minutes away by missile attack, the doctrine of Mutual Assured Destruction (MAD) only works if both sides know whether or not they are being attacked. The launch of missiles or a bomber fleet can easily be seen from space far in advance of either reaching their potential targets halfway around the globe. The danger of surprise attack is therefore small, making an accidental war far less likely.

So what does all this mean? And what do we do about it?

First of all, it means that the advocates of space development, exploration and commercialization have succeeded far beyond their initial expectations and dreams. The economies and security of countries in the developed world are now dependent on space satellites. We space advocates should celebrate our success and be terrified of it at the same time. Should we lose these fragile assets in space, our economy would experience a disruption like no other: ship, air and train travel would stop and only restart/operate in a much-reduced capacity for years (GPS loss). Many banking and retail transactions would cease (VSAT loss). Distribution of news and vital national information would be crippled (communications satellite loss). Lives would be put at risk and the productivity of our farming would dramatically decrease (weather satellite loss). The risk of war, including nuclear war, would increase (loss of spy satellites) and our military’s ability to react to crises would be significantly reduced (loss of military logistics and intelligence gathering satellites).

#### Independently, it’s an impact filter – intelligence is key to environmental mitigation.

Harary 19 [David Harary is the board chair of the Center for Development and Strategy in D.C. "Space Wars Threaten Earthly Intelligence." 08/13/19, *Slate*, https://slate.com/technology/2019/08/space-militarization-earth-observation-satellites.html]

Earth observation is becoming increasingly important as global security threats are more intertwined with deteriorating environmental conditions. Opportunities for mass displacement, civil war, and even greater nuclear proliferation increase as a changing climate fundamentally shifts the geopolitical dynamics that govern countries and their resources. Environmental satellites provide the intelligence and acute warnings needed to mitigate these risks before they occur. Securing these signals in the sky is now more imperative than ever.

#### Scenario two is China.

#### Space mining kills the terrestrial mining industry – oversaturation.

Zeisl 19 [Yasemin Zeisl, MSc in International Relations and Affairs from the London School of Economics and Political Science (LSE), “Three Salient Risks of Mining in Space,” 05/03/19, *GlobalRiskIntel*, https://www.globalriskintel.com/insights/three-salient-risks-mining-space, EA]

A potential overhaul of the mining industry if not the global economy is the second risk of mining in outer space. While resources of essential metals on Earth are also slowly declining, they will likely not deplete in the near future. Importing metals from space would therefore not substitute depleted terrestrial reserves but could rather cause an oversaturation of certain resources on the market. This development would lead to a price drop of metals that are sourced from space. Additionally, a reduction in price of rare metals such as rhodium, platinum, or gold may change the value of existing reserves on Earth. Metals that are expensive now may then be used more lavishly, and this development could boost future progress in technology and engineering. Despite this positive outlook, a transformation of the global economy through space mining may imperil profits and jobs in the existing mining industry.

#### Key to Chinese economic growth.

GH 14 [Greenovation Hub, conducts research on China-relevant issues in climate, energy and sustainable finance with a global perspective, “China’s Mining Industry at Home and Overseas: Development, Impacts and Regulation,” 2014, https://www.ghub.org/cfc\_en/wp-content/uploads/sites/2/2014/11/China-Mining-at-Home-and-Overseas\_Main-report2\_EN.pdf, EA]

Economic Development and Employment Opportunities

The rapid growth China has experienced over the last three decades has been fuelled in part by its mining and metals industries. The industrialization of the country and extensive infrastructure development would not have been possible without high outputs of steel and other construction materials. Likewise, without China’s huge coal industry, there would have been insufficient electricity to power the factories and industries that propelled China to its current position as the world’s second largest economy.

Mining and metal production generates large revenues, which constitutes a significant portion of the country’s GDP. According to the National Bureau of Statistics, in 2010 mining directly contributed around 5.2% of China’s total GDP. This figure is significantly higher if downstream industries and revenues are taken into account. According to the International Council on Mining and Metals (ICMM), in 2010 the total production value of mining in China was over US$69.2 billion, which is an increase of over 555% since 2000. As well as generating revenue through taxation, royalties and sale of resources, mining also supports secondary industries such as those supplying machinery and other services to mining companies. Products of the mining industry can be traded on international markets, further adding to China’s foreign currency reserves.

The mining sector directly employs millions of Chinese citizens and according to the National Bureau of Statistics, in 2011 the total labour force in the mining sector was 6.11 million. The industry also creates downstream employment, for example, by creating business for companies that provide supplies or services to the mine and company employees. Mining companies may also contribute to the local economy in the vicinity of the mine by developing water and electricity supplies and other infrastructure, and in some cases may also contribute to local public services such as education, training and healthcare.

#### Slowing growth causes China lashout as it perceives a closing window of opportunity – emerging tech, digital authoriarianism, Taiwan war.

Brands 21 [Hal Brands and Michael Beckley, \* Henry Kissinger distinguished professor of global affairs at Johns Hopkins University’s School of Advanced International Studies, \*\* associate professor of political science at Tufts University, “China Is a Declining Power—and That’s the Problem,” 07/24/21, *Foreign Policy*, https://foreignpolicy.com/2021/09/24/china-great-power-united-states/, EA]

In some ways, all of this is welcome news for Washington: A China that is slowing economically and facing growing global resistance will find it exceedingly difficult to displace the United States as the world’s leading power—so long as the United States doesn’t tear itself apart or otherwise give the game away. In other ways, however, the news is more troubling. History warns the world should expect a peaking China to act more boldly, even erratically, over the coming decade—to lunge for long-sought strategic prizes before its fortunes fade.

What might this look like? We can make educated guesses based on what China is presently doing.

Beijing is already redoubling its efforts to establish a 21st century sphere of economic influence by dominating critical technologies—such as artificial intelligence, quantum computing, and 5G telecommunications—and using the resulting leverage to bend states to its will. It will also race to perfect a “digital authoritarianism” that can protect an insecure Chinese Communist Party’s rule at home while bolstering Beijing’s diplomatic position by exporting that model to autocratic allies around the world.

In military terms, the Chinese Communist Party may well become increasingly heavy-handed in securing long, vulnerable supply lines and protecting infrastructure projects in Central and Southwest Asia, Africa, and other regions, a role some hawks in the People’s Liberation Army are already eager to assume. Beijing could also become more assertive vis-à-vis Japan, the Philippines, and other countries that stand in the way of its claims to the South and East China Seas.

Most troubling of all, China will be sorely tempted to use force to resolve the Taiwan question on its terms in the next decade before Washington and Taipei can finish retooling their militaries to offer a stronger defense. The People’s Liberation Army is already stepping up its military exercises’ intensity in the Taiwan Strait. Xi has repeatedly declared Beijing cannot wait forever for its “renegade province” to return to the fold. When the military balance temporarily shifts further toward China’s favor in the late 2020s and as the Pentagon is forced to retire aging ships and aircraft, China may never have a better chance of seizing Taiwan and dealing Washington a humiliating defeat.

To be clear, China probably won’t undertake an all-out military rampage across Asia, as Japan did in the 1930s and early 1940s. But it will run greater risks and accept greater tensions as it tries to lock in key gains. Welcome to geopolitics in the age of a peaking China: a country that already has the ability to violently challenge the existing order and one that will probably run faster and push harder as it loses confidence that time is on its side.

#### Emerging tech goes nuclear.

Kroenig 18 [Matthew Kroenig and Bharath Gopalaswamy, \* Associate Professor of Government and Foreign Service at Georgetown University, \*\* director of the South Asia Center at the Atlantic Council, “Will disruptive technology cause nuclear war?,” 11/12/18, *Bulletin of the Atomic Scientists*, https://thebulletin.org/2018/11/will-disruptive-technology-cause-nuclear-war/, EA]

Rather, we should think more broadly about how new technology might affect global politics, and, for this, it is helpful to turn to scholarly international relations theory. The dominant theory of the causes of war in the academy is the “bargaining model of war.” This theory identifies rapid shifts in the balance of power as a primary cause of conflict.

International politics often presents states with conflicts that they can settle through peaceful bargaining, but when bargaining breaks down, war results. Shifts in the balance of power are problematic because they undermine effective bargaining. After all, why agree to a deal today if your bargaining position will be stronger tomorrow? And, a clear understanding of the military balance of power can contribute to peace. (Why start a war you are likely to lose?) But shifts in the balance of power muddy understandings of which states have the advantage.

You may see where this is going. New technologies threaten to create potentially destabilizing shifts in the balance of power.

For decades, stability in Europe and Asia has been supported by US military power. In recent years, however, the balance of power in Asia has begun to shift, as China has increased its military capabilities. Already, Beijing has become more assertive in the region, claiming contested territory in the South China Sea. And the results of Russia’s military modernization have been on full display in its ongoing intervention in Ukraine.

Moreover, China may have the lead over the United States in emerging technologies that could be decisive for the future of military acquisitions and warfare, including 3D printing, hypersonic missiles, quantum computing, 5G wireless connectivity, and artificial intelligence (AI). And Russian President Vladimir Putin is building new unmanned vehicles while ominously declaring, “Whoever leads in AI will rule the world.”

If China or Russia are able to incorporate new technologies into their militaries before the United States, then this could lead to the kind of rapid shift in the balance of power that often causes war.

If Beijing believes emerging technologies provide it with a newfound, local military advantage over the United States, for example, it may be more willing than previously to initiate conflict over Taiwan. And if Putin thinks new tech has strengthened his hand, he may be more tempted to launch a Ukraine-style invasion of a NATO member.

Either scenario could bring these nuclear powers into direct conflict with the United States, and once nuclear armed states are at war, there is an inherent risk of nuclear conflict through limited nuclear war strategies, nuclear brinkmanship, or simple accident or inadvertent escalation.

This framing of the problem leads to a different set of policy implications. The concern is not simply technologies that threaten to undermine nuclear second-strike capabilities directly, but, rather, any technologies that can result in a meaningful shift in the broader balance of power. And the solution is not to preserve second-strike capabilities, but to preserve prevailing power balances more broadly.

#### So does authoritarian expansion.

Orts 18 [Eric Orts, University of Pennsylvania Guardsmark Professor at The Wharton School, “Foreign Affairs: Six Future Scenarios (and a Seventh),” 06/27/18, https://www.linkedin.com/pulse/foreign-affairs-six-future-scenarios-seventh-eric-orts]

7. Fascist Nationalism. There is another possible future that the Foreign Affairs scenarios do not contemplate, and it’s a dark world in which Trump, Putin, Xi, Erdogan, and others construct regimes that are authoritarian and nationalist. Fascism is possible in the United States and elsewhere if big business can be seduced by promises of riches in return for the institutional keys to democracy. Perhaps Foreign Affairs editors are right to leave this dark world out, for it would be very dark: nationalist wars with risks of escalation into global nuclear conflict, further digital militarization (even Terminator-style scenarios of smart military robots), and unchecked climate disasters.

The global challenges are quite large – and the six pieces do an outstanding job of presenting them. One must remain optimistic and engaged, hopeful that we can overcome the serious dangers of tribalism, nationalism, and new fascism. These "isms” of our time stand in the way of solving some of our biggest global problems, such as the risks of thermonuclear war and global climate catastrophe.

#### And Taiwan war.

Sweeney 21 [Mike Sweeney, spent thirteen years as think tank analyst in Washington, DC, where he focused on U.S. foreign policy and defense planning, undertaking research and studies, including for the Department of Defense, “Why a Taiwan conflict could go nuclear,” 03/04/21, *Defense Priorities*, https://www.defensepriorities.org/explainers/why-a-taiwan-conflict-could-go-nuclear, EA]

Compounding matters, the Chinese public is likely to be deeply invested and supportive of a Taiwan campaign once begun. While polling in China is hardly an exact science, one study of multiple opinion surveys found a discernible hawkish bent among the Chinese populace, especially among the younger generations who have undergone so-called “patriotic education,” instituted in 1994.36 This particularly could be the case if U.S. forces were to attempt conventional strikes against air bases, missile launchers, radars, and other facilities on the Chinese mainland. Even though these are military targets, additional collateral damage and civilian casualties are likely. Such attacks could further inflame public sentiment in favor of the war—and against capitulation in the face of defeat—boxing in China’s leadership in the event of conventional setbacks.37

Finally, the existential nature of a potential Taiwan campaign is underscored by China’s understanding of its own military history. As naval scholar Toshi Yoshihara has pointed out, there is heightened recognition among the Chinese of the relationship between major defeat at sea and regime stability.38 For example, it is possible to draw a line from the Japanese destruction of the Qing Dynasty fleet at the Battle of the Yalu River in 1894 through to the Boxer Rebellion five years later.39 Fleets that take immense treasure and decades to construct can be destroyed in a matter of days (or even an afternoon) and the consequences for the nation seldom end with the loss of tonnage.

MAXIMALIST AIMS WILL INVITE MAXIMALIST MEANS

These factors raise an essential point in the calculation regarding Chinese nuclear use: how does any leader survive a defeat over a core tenet of modern Chinese identity like dominion over Taiwan? Or as Ambassador Chas Freeman has put it, for Beijing, a war over Taiwan could “escalate to the nuclear level against the domestic political consequences of accepting humiliation on the core issue of Chinese nationalism.”40

Freeman’s point is worth dwelling on. Any battle over Taiwan will not just be a question of territorial aggression but a fight over the core conception of modern China’s soul. And for the leaders who launch such an endeavor, their political futures will hinge on the outcome, as will, possibly, their physical safety and that of their families in the event of failure. Under such circumstances, nuclear use might not be palatable, but it could seem far more plausible if military defeat were to equate to loss of domestic power and possible death anyway.

Paul Heer, a former National Intelligence Officer for East Asia, has argued that China is not seeking excuses to invade Taiwan. To the contrary, in his view, Beijing fears action by either Washington or Taipei to alter the status quo thereby forcing China’s hand militarily.41

Given the stakes for any leader who ordered an invasion, such trepidation is understandable. Even with highly favorable conditions, amphibious landings remain among the most complex and risky of all military operations. And current conditions—including the immaturity of China’s anti-submarine warfare (ASW) capabilities,42 its lack of amphibious lift, the capabilities of the U.S. Navy, and the 100-mile width of the Taiwan Strait—cannot be construed as entirely favorable despite other advantages, such as Taiwan’s overall proximity and the general growth in Chinese military power.

On the one hand, this is good news as it discourages the likelihood of an overt attempt by China to capture Taiwan. On the other, it means that should such an operation be dared, all elements of Chinese national power would eventually be on the table, especially if U.S. intervention is forthcoming and proves decisive in the early going. This might be the case even if nuclear use was not seen as a viable option by Chinese leaders at the outset of the campaign. The prospect of catastrophic defeat could change their thinking.

COULD THE UNITED STATES RESORT TO NUCLEAR USE?

It is also not entirely outside the realm of possibility that the United States could contemplate nuclear use. (Indeed, some of the main advocates for more openly planning to defend Taiwan have also expressed interest in enhancing U.S. tactical nuclear options for Chinese and Russian conflict scenarios.)43 Up to this point, this paper has mainly addressed the notion that the China’s leadership could be panicked into nuclear escalation. But defending Taiwan should not be seen as either an easy or certain victory for the United States. Although China would face important challenges in accomplishing an amphibious landing on the island, U.S. forces would also have to surmount their own difficulties, which include operating in close proximity to the air and missile forces based on the Chinese mainland. In addition, U.S. warfighting efforts could be impeded by unreliable access to some regional bases (such as in the Philippines) and the vulnerability of other bases (such as in Japan) to Chinese conventional missile attacks.44

How would the American leadership respond in the event of an unexpected reversal? How would the American public? If, say, China was able to sink a single U.S. aircraft carrier—killing perhaps 5,000 Americans—it would inflict in an afternoon more fatalities than U.S. forces suffered in the eight-year Iraq War. As questionable and costly as its post-9/11 conflicts have been, U.S. forces were never routed in massive numbers. Even Vietnam was considered a slow bleed. And after that war’s end, it was frequently asserted as gospel that U.S. forces were never defeated outright on the battlefield. One has to go back 70-years to the Korean War to find examples of U.S. forces taking massive casualties in a single battle and openly retreating in ignominy. It would be jarring to an American public ensconced in the myth of post-Gulf War military superiority to suffer a sudden loss of thousands of lives on a carrier or other high profile naval asset.

Alternately, if China did use conventionally armed missiles against U.S. bases in Japan and Guam, perhaps killing not only U.S. and Japanese military personnel, but also local civilians and U.S. dependents, what reaction would that spark? Is it so far-fetched to consider the United States initiating nuclear use under those circumstances? The United States does have viable tactical options, which it has sought to make more robust in accordance with the findings of 2018 Nuclear Posture Review (NPR).45 These include the deployment of the submarine-launched low-yield W76-2 warhead and development of an upgraded version of the B61 tactical gravity bomb.46 Chinese observers have expressly noted that these systems could make U.S. nuclear use more likely, a situation compounded by diminishing U.S. conventional superiority in the Western Pacific.47

To be clear, as with all aspects of this discussion, the point is not to state with certainty that the United States would resort to nuclear use. It might not be even likely. But it is worth acknowledging that it is possible. That is the element that needs to be injected into the debate not only over the future of strategic ambiguity, but over defense planning for Taiwan scenarios more broadly.

The preferred U.S. style of warfare—to conduct attacks deep throughout an enemy’s territory rather than simply meeting them at a forward line of engagement—also presents problems and contains the prospect that non-nuclear strikes might unintentionally trip Chinese redlines regarding nuclear use. Within the U.S. academic community, this has produced a small, but important body of literature focused on the subject of “entanglement,” or the co-mingling of systems with both conventional and nuclear applications.48 This discussion has primarily focused on China’s ballistic missile force, as most of its systems are capable of firing both nuclear and non-nuclear warheads.49

China’s increasing reliance on road-mobile ICBMs (such as the DF-31 variants and the new DF-41) complicates this problem, creating the potential for their misidentification as shorter-range systems, such as the road-mobile DF-21 and DF-26, that might be used against U.S. ships or regional bases.50 Analysts have also expressed concern over the potential for U.S. forces to inadvertently sink a Chinese SSBN as part of its ASW campaign during a Taiwan conflict, a fear that echoes similar worries from the U.S.-Soviet struggle.51 Recall again the private comments of Chinese officials about conventional attacks on nuclear systems nullifying its NFU policy.

THE POTENTIAL FOR MUTUAL MISCALCULATION

Entanglement issues are far from the whole of the problem. There is still a fundamental misreading—perhaps on both sides—of the ability to manage escalation in Taiwan contingencies for reasons beyond strict operational matters. The very fact of China attempting something as complex and challenging as an amphibious invasion of an island of 24 million people would show an unwelcome tolerance for risk. For that matter, U.S. efforts to defend said island—halfway around the world on another nuclear power’s doorstep—also shows a fair amount of audacity. Put differently, the act of aggression against Taiwan and the effort to repel such an attack both demonstrate that each side is willing to take actions which could be viewed as inherently risky.

Through that lens, the additional step to unwanted nuclear escalation is not a great leap. States act rationally, right up until they do not. In considering how a Taiwan contingency would play out, it would therefore be prudent to assume that nuclear use is more viable than cold assessments of each side’s pre-conflict intentions suggest. If academic surveys of Chinese strategic literature are correct, overoptimism on the ability to manage escalation once hostilities commence is not confined to the U.S. side.52

#### Extinction.

Hamill 19 [Jasper Hamill, citing Coupe et al. 19, Rutgers doctoral student and numerous atmospheric scientists, “Post-apocalyptic ‘nuclear winter’ could send humanity into extinction, scientists warn,” 08/29/19, *Metro*, https://metro.co.uk/2019/08/29/post-apocalyptic-nuclear-winter-send-humanity-extinction-scientists-warn-10650938/, EA]

A nuclear war will plunge Earth into a ‘winter’ which threatens ‘nearly everyone’ on the planet and could cause the extinction of humanity.

Scientists have calculated what would happen if the US and Russia launched their nuclear arsenals during a war of mutually assured destruction.

This cataclysmic conflict would cause a post-apocalyptic nuclear winter that is almost too grim to imagine.

They confirmed that burning cities and forests would throw so much soot into the air that the whole planet would cloud over and shiver through a chilly period lasting up to 10 years.

This would blot out the sun’s light, stop crops from growing and cause a ‘global famine’ that could kill billions or even kill off our species.

A team from Rutgers University and the University of Colorado carried out sophisticated simulations to reveal the severity of a nuclear winter.

They wrote: ‘Massive forest ﬁres ignited by nuclear weapons would rage for weeks after a war, producing a pall of smoke that would obscure the Sun and reduce sunlight at the surface for the duration of the ﬁres.’

‘A nuclear winter could occur from this smoke,’ they added.

‘In a war where nuclear weapons would be used, military and industrial centers located in urban areas would be targeted, which contain fuel loading much higher than forests, thus creating an enormous amount of smoke when burned.

‘Urban ﬁres injecting smoke into the upper troposphere could produce severe climate changes and that urban ﬁrestorms could inject smoke into the stratosphere, leading to rapid interhemispheric transport and a long‐lasting smoke pall.’

The simulation suggests ‘surface light levels remain below 40% of normal for 3 years, returning to normal after about 10 years after the war starts’.

This would mean temperatures barely get above freezing in midsummer in many parts of the world, causing a ‘near 90% reduction in the growing season’ and leaving billions at risk of starvation.

### 1AC---Plan

#### Contention two is solvency.

#### Global public trust bans appropriation of space resources by private

Johnson 20 [Matthew Johnson, PhD, University of Technology Sydney, “Mining the high frontier: sovereignty, property and humankind’s common heritage in outer space,” 2020, PhD Thesis, https://opus.lib.uts.edu.au/handle/10453/142380, EA]

NewSpace techno-fixes offer the pleasant delusion that space colonisation could address contemporary crises of the global commons. NewSpace has linked the space frontier with the fate of the Earthly ecology – I will do the same. However, I will argue here that preserving global commons on Earth and in space requires a legal countermovement against neoliberal constitutionalism (as opposed to its extension) that is predicated on the fortification of intergenerational common and public property rights (as opposed to the further entrenchment of private mining rights in national law). The ‘common heritage of mankind’ principle bears similarities to the stewardship ethos of the public trust doctrine (Baslar 1998). If celestial bodies and terrestrial global commons were treated as public trusts, they could be preserved for the inheritance of future generations. There is an enormity to this task, given the grounding of off-world mineral rights in the sovereignty of the United States, the possibility that this unilateral move will be emulated by other states committed to preserving the neoliberal international legal order (as has already happened with Luxembourg), and the fact that these legislative moves are of a piece with the ‘rogue state’ recalcitrance that has deepened the political impasse on climate change. Yet, contra NewSpace and neoliberal environmentalism, establishing global public trusts for global commons is a goal that is at least grounded in established ‘technologies’ of environmental law.

How do we resist neoliberal constitutionalism – can state sovereignty be used to protect common interests rather than diminish them? Treating outer space as a global public trust is an intriguing possibility, and legal scholar Kemal Baslar (1998) has previously linked the common heritage principle of the Moon Agreement with the public trust project of environmental lawyer Joseph Sax (1969). Sax extended legal understanding of the public trust doctrine from the original ancient Roman focus on tidelands and floodplains. He explored US case law that effectively used this principle in relation to any public lands in which some public institution (federal government, environmental protection agencies and so on) is obligated to act as a trustee. Public trust law involves a public’s legal right to natural resources and creates a “judicially enforceable right which restrains government activities” such that commons “must be held available for the general public” (Sax 1969, p.477). A state’s failure to protect ecosystems and natural resources as public property represents an abrogation of the responsibility of trusteeship (ibid, p. 488-489). This would open states and public agencies to litigation.

Baslar makes the argument that the ‘common heritage of mankind’ principle is essentially a natural law concept (1998, ch.1). Legal rights to use public trusts are fundamental, self-evident rights of humans, and belong to the class of civil, political and solidarity rights that emerged from modernity and the post-WW2 climate of international cooperation (Baslar 1998, p.12). Baslar points to other UN declarations of international environmental solidarity, such as the 1972 Declaration of the UN Conference on the Human Environment (Stockholm) and the 1992 agreements arising from the UN Conference on Environment and Development (Rio de Janeiro; e.g. Agenda 21). Rather than being a ‘principle’, ‘concept’ or legal term of art, the common heritage of mankind needs to be treated as a human right, protected under global public trusts (Baslar 1998).

The public trust doctrine does not prevent private uses of common property, but rather requires that any private use is publicly justified. Sax points to the example of a highway being built through public wetlands, where potential damage to local ecosystems might be acceptable with at least “some public justification” (1969, p.496, emphasis in original). A potential scenario in off-world mining might be the irreversible extraction and use of asteroidal water ice in support of a NASA mission to the outer Solar System or the in situ construction of Martian habitats. Non-spacefaring or rival spacefaring member states of the UN might find this usage acceptable so long as it was used to support a scientific mission (rather than a colonisation project) in which research findings were publicly available and resulted in technological innovations that were patented under some form of open source license. A scenario such as this would entail usufructury rights – “an interest that incorporates the needs of others” (Sax 1969, p.485) – rather than private rights of exclusive ownership. As a public trust, humankind’s common heritage in outer space could still be used at an individual-level, but only with public approval and not for commercial exchange under a system of distributed decision-making (as is the case in market capitalism).

The public trust doctrine and common heritage principle are valuable because they underline the necessity of intergenerational rights in the governance of global commons. It is plainly inadequate to treat rights to the global commons as belonging to only the present generation of peoples. Heritage implies inheritance and ‘holding in trust’ – a more collective understanding of inheritance than the private philanthropy that funds think-tanks like the Heritage Foundation. If equal rights to freely access and use commons are only bestowed upon those alive today, the present generation’s exercise of those rights will prevent future generations from doing the same. George Monbiot (2019) has recently questioned the UN’s Universal Declaration of Human Rights, asserting that it “is almost meaningless, because there is nothing in the declaration insisting that one generation cannot steal from the next”. Monbiot’s phrasing is hyperbolic, considering the importance of this Declaration to national civil rights movements and domestic social welfare policies (among others), but his comment nonetheless accentuates how human rights need to be framed in environmental or intergenerational terms. The Anthropocene can be defined as an inter-generational project in intergenerational theft, from the destruction of essential life-supporting planetary systems to the appropriation of non-renewable resources, like that proposed for the off-world. Monbiot (2019) offers an additional article to the Universal Declaration of Human Rights: “Every generation shall have an equal right to the enjoyment of natural wealth”. Stewardship and preservation are essential to any commons.

The public-trust doctrine has been deployed as a solution to anthropogenic climate change, opening up the prospect of ‘atmospheric trust litigation’ – legal action against states unwilling to enact meaningful strategies to reduce carbon emissions. Numerous movements have either proposed creating a public trust for the atmosphere or have drawn on public trust precedents in order to charge nation states with a failure to protect inter-generational rights to an atmosphere capable of supporting human and non-human life. Australian academic Robert Costanza has argued that the atmosphere is one of many natural assets that “must be held in trust to serve the public good” and that it should be “every government’s responsibility as a trustee to protect these assets as natural capital, and to maintain them for the public’s use, not give them away or sell them to private parties” (2016, p.466). Costanza is part of the Claim The Sky movement, which has proposed an international Atmospheric Trust that could “collect claims for damages to the atmosphere and invest funds in mitigation, adaptation and compensation” (n.d.). The 2015 Urgenda climate case involved 886 Dutch citizens launching action against the Dutch Government for failing to protect their rights to the atmosphere. The initial decision in favour of the plaintiffs required the Government to reduce national carbon emissions to 25% of 1990 levels and was recently upheld in the Hague Court of Appeal (Urgenda 2018). In 2015, the Juliana et al. v. United States, et al. case was filed by 21 youth climate activists, charging that the US Government’s failure to act on climate change represented a failure to protect their constitutional rights to life, liberty and happiness.114 Public trust law has thus been revitalised during the escalation of our planetary climate emergency.

However successful public trust litigation may prove to be on Earth, these cases highlight the challenges in introducing something similar for outer space. Do global demoi have inalienable rights to pristine off-world environments? What is the ‘state’ that would be abrogating responsibility for protecting the space commons – the United Nations? Indeed, who would be the plaintiff in any legal action seeking to enforce the common rights of ‘all mankind’?115 In global commons like the oceans and atmosphere, the necessity of the stewardship ethos and intergenerational rights is clear, but in outer space it is less obvious. No living organism on Earth depends on celestial bodies (excluding the Sun and Moon, of course) for their survival. Moreover, the functioning of the public trust doctrine is clearer when the nation state is the unit of analysis – or, indeed, smaller jurisdictional units, such as the body of Massachusetts and Californian law that Sax drew on (1969).

Yet a stewardship ethos in outer space could be vitally important for future generations. At the risk of descending into NewSpace Malthusianism, the global population is projected to reach 9.7 billion people by 2050 (UN 2015). Future societies (if not the present generation) will likely deplete key resources on Earth and may have to attempt exploiting offworld resources (assuming a circular economy of efficient resource recycling does not eventuate). Lee (2012) links the space commons with the atmospheric commons by pointing to the potential expansion of the hydrogen economy. Hydrogen fuel cells in cars, for instance, produce electric power using water (rather than fossil fuels) and produce no greenhouse gases. However, hydrogen fuel cells are most commonly dependent on platinum as a catalyst, and – as space mining firms and Goldman Sachs have identified (Edwards 2017) – platinum is rare on Earth but abundant in outer space. A private property system of resource exploitation would lead to unequal access and risk over-exploitation of any valuable offworld mineral reserve – and, if NewSpace’s more expansive plans eventuated, could be used for in situ manufacturing of spacecraft and habitats rather than for the more essential goal of global adoption of zero emissions technologies.

#### The doctrine solves – its flexibility means it can adapt to deficits and new environments and bypass enforcement.

Babcock 19 [Hope M. Babcock, Professor of Law, Georgetown University Law Center, “The Public Trust Doctrine, Outer Space, and the Global Commons: Time to Call Home ET,” 2019, *Syracuse Law Review*, Vol. 69, https://lawreview.syr.edu/wp-content/uploads/2019/09/H-Babcock-Article-Final-Document-v2.pdf, EA]

F. The Public Trust Doctrine (PTD) as a Gap Filling, Place-Holding Management Approach506

The PTD offers both an approach for managing an open access commons and a gap-filling tool until a regulatory regime is adopted.507 The doctrine is based on the idea that the “sovereign holds certain common properties in trust in perpetuity for the free and unimpeded use of the general public.”508 The public’s right to access and use trust resources is never lost, and neither the government nor private individuals can alienate or otherwise adversely affect those resources unless for a comparable public purpose.509 The resources the doctrine protects “have long been part of a ‘taxonomy of property’ [that recognizes] the division of natural wealth into private and public property.”510

“The doctrine places on governments ‘an affirmative, ongoing duty to safeguard the long-term preservation of those resources for the benefit of the general public,’”511 thus limiting the sovereign’s power on behalf of both present and future individuals.512 It directs the government to manage trust resources for public benefit, not private gain.513 It applies to private as well as public resources and is used to preserve the public’s access to CPRs.514 Government agencies have the non-rescindable power to revoke uses of trust resources that are inconsistent with the doctrine.515 This effectively places a permanent easement over trust resources that burdens their ownership with an overriding public interest in the preservation of those resources.516 However, trust resources can be alienated in favor of private ownership, if the alienation will still serve the public’s interest in those resources and not interfere with trust uses of the remaining land.517 The PTD, therefore, protects the “people’s common heritage,”518 just as Article 11 of the Moon Treaty protects outer space as part of the common heritage of mankind.519

The doctrine also appears to be infinitely malleable. Original uses of the doctrine were restricted to only that “aspect of the public domain below the low-water mark on the margin of the sea and the great lakes, the waters over those lands, and the waters within rivers and streams of any consequence,”520 and covered only traditional uses of those lands, like fishing and navigation.521 Over time, the scope and application of the doctrine broadened to protect more public resources and different uses.522 Thus, the doctrine expanded to protect new trust resources, such as dry sand beaches, inland lakes, groundwater, dry riverbeds, and wildlife,523 and passive uses of those resources, like scientific study.524 The original link to navigable water and tidelands disappeared.525 Supporters of the doctrine successfully advocated that it be applied to “wildlife, parks, cemeteries, and even works of fine art,”526 while arguing more recently its application to the atmosphere.527

A doctrine that imposes a perpetual duty on the sovereign to preserve trust resources, prevents their alienation for private benefit, assures public access to them, and can be invoked by anyone seems particularly useful as a management tool in outer space.528 The fact that public access to trust resources is so central to the doctrine makes it reflective, not contradictory, of international space law’s bar against appropriation of outer space and of the principle of space being the “province of all mankind.”529 [BEGIN FN 529] 529. See Babcock, supra note 509, at 892 (internal footnote omitted) (“Since property containing trust lands is conveyed subject to the doctrine, absolute private dominion over property impressed with the public trust can never be granted unless it is in the public interest to do so.”); see also Ill. Cent. R.R. Co. v. Illinois, 146 U.S. 387, 453 (1892). [END FN 529] It avoids the problems of alienation and exclusion associated with any of the management approaches associated with some form of private property and requires neither the creation of a new administrative authority nor the presence of a close-knit group of like-minded people.530 Members of the public, both rich and poor, can invoke and enforce the doctrine as easily as the sovereign.531 It is cost effective to the extent that no separate apparatus is required to implement it, and the doctrine has shown itself to be highly adaptable and innovative as different needs arise.532 It could also fill the gap in international law with respect to managing celestial property. Therefore, of all the management approaches studied here, the PTD seems the most suited to keep order in space until a regulatory regime is imposed.

#### No turns – Public Trust threads the needle by allowing sustainable exploitation without appropriation.

Pastorius 13 [Claudia Pastorius, J.D., Barry University School of Law, “Law and Policy in the Global Space Industry's Lift-Off,” 2013, *Barry Law Review*, Vol. 19, Issue 1, https://lawpublications.barry.edu/cgi/viewcontent.cgi?article=1007&context=barrylrev, EA]

C. The Public Trust Doctrine

Rooted in Roman law, the public trust doctrine, whereby a state actor holds and manages property in trust for the benefit of the public, is now regularly applied through common law and statutory regulations around the world.280 The origins of the public trust doctrine are found in the Justinian Institute’s declaration that the air, running water, and the seas (and seashores) were common to mankind, and as such, are resources to be protected by the sovereign.281 Virgiliu Pop, a Romanian Space Agency researcher, postulates that the Outer Space Treaty essentially creates a public trust in the agreement by stating: “for the benefit of and in the interest of all countries” in Article I.282 The missing piece of the puzzle, he claims, is the undesignated trustee(s).283 The sovereign or state is traditionally the trustee in a public trust.284

In a public trust holding property ownership rights, the bundle of property rights285 is thus divided between the trustee (the State) and the beneficiaries (the Public).286

There are two co-existing interests to trust lands: the jus publicum which is the public’s right to use and enjoy trust lands; and the jus privatum which is the private property rights that may exist in the use and possession of trust lands. The State may convey the jus privatum to private owners, but this private interest is subservient to the jus publicum, which is the State’s inalienable interest that it continues to hold in the trust land or water.287

The ownership of the property thus remains with the trustee; but, the rights to exclude, use, and enjoy could be allocated to a group, an individual, or an entity.288

The United Nations created a Trusteeship Council in the hopes of applying the common heritage of mankind doctrine, but its operations centered on work with post-war decolonization territories and were suspended in 1994..289 In its inception, it was conceived that the Trusteeship Council would operate as the “trustee of the common heritage of humankind to ensure the necessary coordinated approach to this concern” and manage the jus privatum rights of common heritage properties.290 The board of trustees consisted of: China, France, Russia, the United Kingdom and the United States—the five permanent members of the Security Council.291 Proposals to utilize the Trusteeship Council to address management of “global commons” have made little progress.292 One contributing factor to the ineffectiveness of the Trusteeship Council may be that the political differences between Security Council members often leads to a stalemate in decisionmaking.293

Despite the dissolution of the Trusteeship Council, there are utilitarian reasons why the formation of a trust for outer space resources would minimize economic detriments to all nation-states and optimize economic benefits of outer space development for all, particularly for spacefaring pioneer nations.294 The common heritage of mankind and public trust doctrine’s proposals and applications have been met with resistance due to the tension between the “haves” and the “have-nots,” or the developed and developing nations.295 However, the successful application of public trusts to environmental resource management could be changing perspectives on the utility of the doctrine.296 Where there are common preservation and conservation goals for a given resource, the public trust is more likely to succeed as the means for managing the benefits and responsibilities relative to the resource.297

Two successful applications of the public trust principles that could influence the management of outer space resources are the International Telecommunications Union (ITU) and the United States Bureau of Land Management (BLM).298 The ITU issues licenses for orbital allocations of satellites and the use of radio frequencies.299 By necessity, the nation-states of the world have peaceably participated in the licensing regime.300 A true tragedy of the commons would result if our telecommunications channel appropriations were chaotic, and, if entities placed satellites into orbit unilaterally with no precautionary coordination.301 Without coordination and commitment to the rules, the overlapping noises would prevent people from hearing each other on the radio, and millions of dollars of satellite equipment, as well as our communication systems, would be at risk.302

The BLM raises an incredible amount of revenue for the government by selling leases of publicly managed lands for oil and natural gas exploration and exploitation to the United States.303 The BLM raised $233 million through leases of public lands in 2012 alone.304 Methods the BLM employs that could be adopted for use with outer space leaseholds are: (1) the auctioning of leases; (2) relative pricing per acre of lease payments depending on whether or not the land is producing; (3) imposing environmental resource management limits on resource exploitation, and (4) issuing fixed term leases with conditions for renewal.305 Some space law academics have noted that United Nations’ treaties and other space law accords will need to distinguish surface property rights on celestial bodies and extraction rights.306 Some even argue that asteroids should be treated as chattel and not land.307 The BLM legal property rights management is an excellent model to look to for establishing the legal property rights that will be needed in outer space for mining minerals, extracting water, and harvesting Helium-3.

If leasehold estates held in trust were conferred in outer space, then measures could be taken to ensure optimal and equitable allocation of outer space leaseholds, and rules could be imposed to manage the sustainable exploitation of space resources.308 Problems such as space debris pollution could be avoided by reviewing development plans to ensure measures to prevent pollution, exit strategies of endeavors, or plans of relative permanence are in place before the projects take-off.309 Controversies regarding planned celestial land use and competing claims to more lucrative territories could be arbitrated and resolved on Earth. From an economic perspective, even though the possibility of “free” appropriation of outer space resources might encourage more space exploration initiatives, development with consistent and reliable rules would provide the stronger incentive of protecting the commercial investments in space exploration.310

An outer space public trust can also be more economically beneficial for nation-states and the people within them. Lease payments for outer space exploration, exploitation, and building rights could be very lucrative for spacefaring nation-states.311 A different form of income from the global space industry may help re-capture lost economic benefits of space program investments that may occur because of the transferability of financial benefits within the globalized economy.312 Beneficiaries do not have to benefit equally in a trust; in fact, the principles of the common heritage of mankind doctrine assert that the benefits should be shared “equitably.”313 Distributions could be made equitably by establishing pro rata criteria for nation-state “shares” in the trust such as space program budget investments, the value of nationally incorporated space technology firms, and a nation-state’s stake in a given venture. Non-spacefaring nations could have nominal shares in the trust with the option of increasing their number of shares when they invest in the global space industry. Spacefaring nations could economically benefit in proportion to their investments in the global space industry and in particular ventures. In this manner, the benefits of space activities could be commonly shared by nation-states in a more equitable manner while also encouraging investments in infrastructure and funding to benefit the commercial space corporations.

#### We affirm: The appropriation of outer space by private entities is unjust.

#### Plan: states ought to recognize that the appropriation of outer space by private entities is unjust through an implementation of a global public trust doctrine regulating outer space.

### 1AC---Framework

#### The standard is maximizing expected wellbeing.

#### 1] Actor spec – governments must use util because they don’t have intentions and are constantly dealing with tradeoffs—takes out calc indicts since they are empirically denied.

#### 2] Death is bad and outweighs – a] agents can’t act if they fear for their bodily security which constrains every ethical theory, b] it destroys the subject itself – kills any ability to achieve value in ethics since life is a prerequisite which means it’s a side constraint since we can’t reach the end goal of ethics without life

#### 3] Pleasure and pain are the starting point for moral reasoning – they’re our baseline desires and the only things that explain the intrinsic value of objects or actions.

Moen 16 [Ole Martin Moen, Professor of Ethics at Oslo Metropolitan University, “An Argument for Hedonism,” 2016, *The Journal of Value Inquiry*, Vol. 50, pp. 267-281, https://link.springer.com/article/10.1007/s10790-015-9506-9]

Let us start by observing, empirically, that a widely shared judgment about intrinsic value and disvalue is that pleasure is intrinsically valuable and pain is intrinsically disvaluable. On virtually any proposed list of intrinsic values and disvalues (we will look at some of them below), pleasure is included among the intrinsic values and pain among the intrinsic disvalues. This inclusion makes intuitive sense, moreover, for there is something undeniably good about the way pleasure feels and something undeniably bad about the way pain feels, and neither the goodness of pleasure nor the badness of pain seems to be exhausted by the further effects that these experiences might have. ‘‘Pleasure’’ and ‘‘pain’’ are here understood inclusively, as encompassing anything hedonically positive and anything hedonically negative.2

The special value statuses of pleasure and pain are manifested in how we treat these experiences in our everyday reasoning about values. If you tell me that you are heading for the convenience store, I might ask: ‘‘What for?’’ This is a reasonable question, for when you go to the convenience store you usually do so, not merely for the sake of going to the convenience store, but for the sake of achieving something further that you deem to be valuable. You might answer, for example: ‘‘To buy soda.’’ This answer makes sense, for soda is a nice thing and you can get it at the convenience store. I might further inquire, however: ‘‘What is buying the soda good for?’’ This further question can also be a reasonable one, for it need not be obvious why you want the soda. You might answer: ‘‘Well, I want it for the pleasure of drinking it.’’ If I then proceed by asking ‘‘But what is the pleasure of drinking the soda good for?’’ the discussion is likely to reach an awkward end. The reason is that the pleasure is not good for anything further; it is simply that for which going to the convenience store and buying the soda is good.3 As Aristotle observes: ‘‘We never ask [a man] what his end is in being pleased, because we assume that pleasure is choice worthy in itself.’’4 Presumably, a similar story can be told in the case of pains, for if someone says ‘‘This is painful!’’ we never respond by asking: ‘‘And why is that a problem?’’ We take for granted that if something is painful, we have a sufficient explanation of why it is bad.

If we are onto something in our everyday reasoning about values, it seems that pleasure and pain are both places where we reach the end of the line in matters of value.

#### 4] Specifically, extinction outweighs – magnitude, irreversibility, uncertainty.

MacAskill 14 [William MacAskill, Associate Professor in Philosophy and Research Fellow at the Global Priorities Institute, University of Oxford, “Normative Uncertainty,” 2014, University of Oxford PhD Thesis, http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.677.4121&rep=rep1&type=pdf]

However, even if we believe in a moral view according to which human extinction would be a good thing, we still have strong reason to prevent near-term human extinction. To see this, we must note three points. First, we should note that the extinction of the human race is an extremely high stakes moral issue. Humanity could be around for a very long time: if humans survive as long as the median mammal species, we will last another two million years. 188 On this estimate, the number of humans in existence in the future, given that we don’t go extinct anytime soon, would be 2×10^14. 189 So if it is good to bring new people into existence, then it’s very good to prevent human extinction.

Second, human extinction is by its nature an irreversible scenario. If we continue to exist, then we always have the option of letting ourselves go extinct in the future (or, perhaps more realistically, of considerably reducing population size). But if we go extinct, then we can’t magically bring ourselves back into existence at a later date.

Third, we should expect ourselves to progress, morally, over the next few centuries, as we have progressed in the past. So we should expect that in a few centuries’ time we will have better evidence about how to evaluate human extinction than we currently have.