## Off – T

#### Interpretation: the affirmative must only defend the appropriation of outer space by private entities is unjust

#### Two violations:

#### 1] Appropriation means to take as property in the exclusion of others – not to put into space

Leon 18 (Amanda M., Associate, Caplin & Drysdale, JD UVA Law) "Mining for Meaning: An Examination of the Legality of Property Rights in Space Resources." Virginia Law Review, vol. 104, no. 3, May 2018, p. 497-547. HeinOnline.

Appropriation. The term "appropriation" also remains ambiguous. Webster's defines the verb "appropriate" as "to take to oneself in exclusion of others; to claim or use as by an exclusive or pre-eminent right; as, let no man appropriate a common benefit."16 5 Similarly, Black's Law Dictionary describes "appropriate" as an act "[t]o make a thing one's own; to make a thing the subject of property; to exercise dominion over an object to the extent, and for the purpose, of making it subserve one's own proper use or pleasure."166 Oftentimes, appropriation refers to the setting aside of government funds, the taking of land for public purposes, or a tort of wrongfully taking another's property as one's own. The term appropriation is often used not only with respect to real property but also with water. According to U.S. case law, a person completes an appropriation of water by diversion of the water and an application of the water to beneficial use.167 This common use of the term "appropriation" with respect to water illustrates two key points: (1) the term applies to natural resources-e.g., water or minerals-not just real property, and (2) mining space resources and putting them to beneficial use-e.g., selling or manufacturing the mined resources could reasonably be interpreted as an "appropriation" of outer space. While the ordinary meaning of "appropriation" reasonably includes the taking of natural resources as well as land, whether the drafters and parties to the OST envisioned such a broad meaning of the term remains difficult to determine with any certainty. The prohibition against appropriation "by any other means" supports such a reading, though, by expanding the prohibition to other types not explicitly described.168

#### 2] The word ‘through’ means by means of - the 1ac defends space debris as a means of appropriation which it isn’t

7th Circuit Court of Appeals 77 (United States v. Nerone, 563 F. 2d 836 - Court of Appeals, 7th Circuit 1977) EE

Appellants Seppi and Nerone formulate the second prong of their argument by first noting that the Government could have drafted the indictment by charging the "enterprise" consisting of Fox, Nerone, and Seppi to the exclusion of Maple Manor, Inc. They assert that the Government had a two-fold purpose in including the corporate entity. First, the Government wanted to bring the conduct of Fox within the scope of § 1962. Second, the Government wanted to secure a forfeiture of the property of Maple Manor, Inc. under 18 U.S.C. § 1963. The appellants further contend that the Congressional use of the word "through" in § 1962(c) was not intended to be meaningless. They submit, correctly we think, that the most logical definitions to ascribe to that word as used in the statute are "by means of, in consequence of, by reason of." See Black's Law Dictionary 1652 (Rev. 4th ed. 1968). Their fundamental contention, although we have somewhat paraphrased it, is that if the word "through" is to have operative meaning, the Government must offer some proof that the affairs of the charged enterprise were conducted through a pattern of racketeering activity or through collection of unlawful debt.

#### 1] Precision: Pre-round prep is centered around DAs against formal sovereignty and case responses to it, their interp means the only basis for predictability becomes the wiki, which moots all pre-topic prep.

#### 2] Limits: They blow up the topic to putting anything into outer space, allowing affs to rush to the margins to anything from the ISS to space hotels, telescopes, types of satellites, rockets,

#### DTD – most logical - T indicts the entire aff

#### Ccompeting interps – reasonability is arbitrary and requires intervention

#### No RVIs – 1] illogical – shouldn’t win for being fair 2] forces us into a theory debate which crowds out substance 3] norming – I can’t concede the counterinterp if I realize I’m wrong

## Off – DA

#### ACA passed the House, but PC is key to get bipartisan support through the Senate.

Gump 2-15 [Akin; 2-15-22; Strauss Hauer & Feld LLP; “America COMPETES Act v. US Innovation and Competition Act—Summary of Key Differences and Takeaways,” <https://www.jdsupra.com/legalnews/america-competes-act-v-us-innovation-8714158/>] brett

On Friday, February 4, 2022, the House passed the America COMPETES Act on nearly a straight party line vote to, among many other priorities, fund domestic semiconductor chip manufacturing, dramatically increase scientific research and development funding, revive lapsed trade programs and re-orient the United States’ international posture towards competition with China. In taking this step, the House is catching up to the Senate, which passed the United States Innovation and Competition Act (USICA) last July on a bipartisan vote of 68-32. This alert includes side-by-side summaries comparing the two bills in each of those areas, which can be found in the previous links. Over the coming weeks and months, leaders from the House and Senate will seek to negotiate a final bill that can meet approval of 60 Senators and a majority in the House. The bill likely represents one of the last opportunities for significant bipartisan legislative achievement this Congress. While the Biden-Harris administration and Democratic congressional leaders have a publicly stated goal of completing negotiations ahead of the State of the Union on March 1, it is far more likely that a final agreement is not reached until weeks or months after that speech. This timeline is dictated not just by the political incentives for each party, but also the wide policy gulfs that must be overcome between the two bills. To make clear the differences between these two bills, each totaling nearly 3,000 pages, Akin Gump is creating side-by-side tables comparing the major titles of the House-passed COMPETES Act and the Senate-passed USICA. In this alert, you will find comparison tables for the titles regarding CHIPS Act funding, funding for scientific research and development, trade policy, and foreign policy. Readers can use the table of contents to jump to different subject matters to see what the bills have in common and how they differ. A future Akin Gump policy alert will deliver the side-by-sides for the remaining titles. In addition, we are planning a series of webinars to discuss the various subject matters. The first one is scheduled for Wednesday, February 23 at 3 p.m. ET and will discuss a proposed outbound investment screen and export controls. A formal invite will be circulated shortly. The battle between the House and Senate on visions for improving America’s competitiveness is now joined, but whether a final bill will reach the President’s desk remains to be seen.

#### The plan trades off -- treaties require PC and floor time.

---even if popular, opposition ensures immense floor time due to Senate procedures.

Kelley & Pevehouse 15 [Judith G.\*, Duke Sanford School of Public Policy; AND Jon C.W.\*\*, University of Wisconsin-Madison; International Studies Quarterly (2015); “An Opportunity Cost Theory of US Treaty Behavior,” <https://dukespace.lib.duke.edu/dspace/bitstream/handle/10161/12521/isqu12185.pdf?sequence=1>] brett

An Opportunity Costs Theory

Although existing theories about veto players and political ideology explain the fate of some treaties, they leave some questions open. To complement these theories, we draw on economic theory to offer an opportunity cost theory of treaty ratification. In economics, the opportunity cost of a resource refers to the value of the nexthighest-valued alternative use of that resource. Scholars of domestic legislation have applied this concept to the time and resources of individual policymakers (Schiller 1995) but also to the fixed chamber time. For example, Koger refers to “[T]he foregone uses of the same [chamber] time for legislators as individuals as well as for the chamber collectively” (Koger 2010:22). Indeed, the Senate’s chamber time is not only fixed, but also scarce. A vast portion of its time goes to required routine business. This leaves little opportunity for discretionary activities (Walker 1977). Given that international policy matters have to draw on exactly the same remaining discretionary floor time as domestic policy, we argue that the United States sometimes delays or derails treaty ratification simply because political capital and Senate floor time are fixed and entail opportunity costs (Heitshusen 2013:4). As Koger (2010:33) argues more generally for legislation, “The expected gains from making a proposal must exceed the time and effort legislators invest in preparing it, organizing and coalition to support it, and taking the time of the chamber to debate and pass it.”

For a treaty to progress, the opportunity cost logic thus would mean that the net gains of the treaty must outweigh the opportunity costs of the advice and consent process. Thus, if the President or some Senators assign only low political value to a particular treaty or if they believe that passage of the treaty will take a lot of Senate floor time, they may decide that they would rather spend their political capital on other matters. If they think they have to fight a war of attrition to overcome opposition, this cost in terms of time and resources may tip the scales against moving the treaty forward. Under these conditions, the opportunity cost of processing the treaty may be too high for the treaty to gain attention, even if the President or more than the required two-thirds of the Senators think the treaty yields some benefits. As a result, whether or how fast a treaty makes it through the process depends on whether it has sufficient support to pass the constitutional process and on whether its value to politicians outweighs the opportunity cost of their political resources: legislative floor time and political capital.

The Fixed Political Agenda Space and Policy Priorities

Why do treaties incur these opportunity costs? Opportunity costs arise when resources are fixed and fully employed. Political agenda space is such a resource; there are only so many policy priorities a President can promote, and only so much Senate floor time to consider them. The media will pay attention to only so many issues on the Washington agenda. Both the President and the Senate must protect their legislative opportunities. They each face opportunity costs.

For the President, the transmittal process is not simple. If the United States signs an international agreement that falls under Article II of the Constitution, the President must transmit it to the Senate for advice and consent before the United States can ratify it. This process entails an analysis of the implications of the treaty including possible implementation legislation required, and the writing of a transmittal letter that serves as a report to the Senate Foreign Relations Committee (SFRC). Because of these requirements, usually there has to be some push from the White House (Halloran 2011), and this can take precious time away from domestic legislative priorities. Thus, transmittals can be costly, especially in the face of expected opposition. Indeed, in 1995 when President Clinton wanted to transmit the UN Convention on the Rights of the Child to the Senate, Jessie Helms, who chaired the SFRC, and 26 cosponsors introduced a resolution urging him to not transmit the Convention. Such opposition can be distracting or politically harmful for the President. Furthermore, because the President usually endorses the treaty in the transmittal letter, he may incur a reputational cost by transmitting treaties that stall (Krutz and Peake 2009:140). Dealing with treaties thus involves political costs, and withholding transmittal can conserve political capital.

For the Senate, floor time is of the essence. After transmittal, the SFRC must hold a meeting on the treaty, and eventually issue its own analysis and recommendation, and (if it has enough support) pass it out of committee. The treaty then has to be scheduled for debate, possible amendments, and a vote. To gain Senate advice and consent, the treaty must pass with at least a two-thirds majority. Crucial to differentiating the opportunity cost argument from a straight veto player model, the Senate rules for debate and passage enable opponents to increase the time expended on a treaty, even if they do not have the ability to vote it down on the floor. Dealing with a treaty thus ties up the SFRC time, but even more importantly, it could potentially take up scarce discretionary time on the Senate floor. Senators seek to maximize their reputational returns from the issues they spend time on, favoring issues that have broad appeal (Walker 1977:430). Before scheduling a treaty for debate and a vote, the relevant actors therefore have to consider the opportunity cost of dealing with the treaty: What else could the Senate accomplish with that time? Even if the Senate is not being productive in terms of passing legislation, what else does the Senate want to be seen focusing on at that moment? Even if there is strong support for a treaty, Senators may hold back if they anticipate serious and potentially time consuming opposition—opposition that can result in any number of procedural maneuvers that could take up costly time in the Senate. This explains why so few treaties ever take up much floor time for debate. If senators expect them to take time, they do not schedule them.

Thus, both the President and the Senate face opportunity costs of fixed resources: Presidents are concerned with “misusing” political capital and opportunities. The Senators are protective of floor time, or how they are seen to be using their time by a public foremost focused on domestic matters. At the same time, the political benefits of treaty ratification are uncertain. Treaty ratification is often invisible, because the media rarely covers such events and whatever benefits treaties may bring may never be attributed to the treaty advocates directly.

The implication of these political calculations is central to our argument: Contrary to standard assumptions of international relations, the decision to push a treaty through the advice and consent process may be less about an isolated examination of costs and benefits of the treaty itself than about the political benefit of spending time on the treaty relative to the benefit of other possible agenda activity that may produce important domestic legislation such as health-care reform, for example. In other words: Senate advice and consent and, by association, transmittal decisions depends on the associated legislative opportunity cost.

The opportunity cost can manifest itself for many types of treaties. Even nondivisive treaties require some Presidential attention and Senate floor time to move through the process (Johnson 2010), and therefore even these may fall by the wayside, which is of course even more likely to occur if they are not considered particularly vital. More important treaties might also be affected by the opportunity cost, however. Even if opponents might not command the requisite 1/3 of Senators to block the treaty, their willingness to obstruct it (even the threat to do so) may impose such high costs in terms of time that supporters are reluctant to spend time on it when they have many competing priorities. In a time-constrained Senate, minimal winning coalitions that reach supermajority status have become less important. Each piece of legislation must compete with all other legislation and having only a minimum backing can deprioritize legislation on the agenda, slowing it down (Oppenheimer 1985:410). And although the Senate can use a cloture vote to end filibustering and technically should be able to do so easily if the treaty commands two-thirds support, Senators may be reluctant to push for treaties that push these boundaries (for example, by objecting to a unanimous consent request (Heitshusen 2013:4)).

#### ACA key to struggling U.S. economy.

DelBene 2-2 Suzan DelBene, American politician and businesswoman, 2-2-2022, "American competitiveness legislation is the key to tackling today's economic challenges, creating tomorrow's opportunities," TheHill, [https://thehill.com/blogs/congress-blog/technology/592447-american-competitiveness-legislation-is-the-key-to-tackling //](https://thehill.com/blogs/congress-blog/technology/592447-american-competitiveness-legislation-is-the-key-to-tackling%20//) ella

The ongoing COVID-19 pandemic, supply chain disruptions, and decades of underinvestment in U.S. infrastructure and manufacturing have resulted in higher prices for Americans at the grocery store and gas pump. The Biden administration and Congress have already acted to ease inflation and clear bottlenecks by extending operations at major ports, releasing oil from the Strategic Petroleum Reserve, and enacting the bipartisan infrastructure law. But this can’t be the end of our work. Right now, Congress can address the challenges facing families and keep the Biden Boom going by taking bipartisan action on American competitiveness legislation to secure our supply chains, cut costs, strengthen American leadership, spur innovation and create good-paying jobs that will set the U.S. up for long-term economic success. In December, the New Democrat Coalition announced our top priorities for this legislation and worked to ensure they were included in the House’s America COMPETES Act. Doing so will address many of the problems we face today, create opportunities for tomorrow, and help America succeed in the 21st century. First and foremost, this legislation must address the global microchip shortage. From cars and clean energy technologies to cell phones and dishwashers, semiconductors and microchips are critical to the products Americans rely on every day. But the current global chip shortage is driving prices up for American consumers in many sectors. For example, new car prices rose by as much as 14% over the last year and used car prices rose 37%. Passing legislation that strengthens global supply chains and supports domestic manufacturing will not only bolster our supply of microchips, but also lower costs, create good American jobs, and help the U.S. lead in the global economy. That’s a win, top to bottom. To compete globally, we also need to leverage the talent of hard-working Americans in diverse communities across this country. Right now, jobs in the technology and innovation sectors are concentrated in just a handful of cities on the coasts. Just five U.S. cities account for 90% of the recent growth in innovation jobs. That’s a lot of untapped potential and communities being left behind. By investing in new innovation centers in regions outside of existing technology hubs like Silicon Valley, we can unlock the potential of communities like Madison, Wis., and Allentown, Pa., to attract new industries, tackle break-through challenges, and create the jobs of the future. If we’re going to fill those jobs, we also need to support the next generation of high-tech and highly skilled American workers. I understand personally how important well-funded educational and research opportunities are to STEM jobs. Before I came to Congress, I was lucky to receive a quality education that prepared me for a job in science and technology. By expanding research fellowships and undergraduate research opportunities, specifically at historically Black colleges and universities, Hispanic-serving institutions, and tribal colleges and universities, American workers will gain the skills to thrive in the global economy. Increasing educational opportunities and funding will also ensure America leads the world as innovators and creators. None of these investments happen in a bubble. America is made stronger through the support of our allies and close trading partners. That’s why we must leave behind the isolationist policies of the last administration and reclaim the mantle of being rule makers, not rule takers. We are in a global race for the future and if we don’t make these key investments, we put our national security, our allies, and our values at risk. As countries around the world ramp up their investments in science and technology, we must make sure we aren’t just keeping pace, but are staying one step ahead. This legislation levels the playing field so that the U.S. can fairly compete on the global stage.

#### Economic decline encompasses AND outweighs every existential threat

Posen 21, Adam S. Posen is the president of the Peterson Institute for International Economics. PIIE, Feb 2021. “Rebuilding the Global Economy” <https://www.piie.com/sites/default/files/documents/piieb21-1.pdf> brett

The world economy is experiencing a corrosion of globalization. The web of economic and commercial ties across the world is fraying, with more frequent and larger gaps in it—even as trade in goods, services, and technology shifts locations and in some places grows. For globalization is multidimensional, encompassing much more than international trade, though panic about trade gets most of the political and press attention. What matters for human welfare is the quality, not the quantity, of globalization. As global economic integration deteriorates, its benefits for everyone are eroding.

Worldwide, people want to be left in peace, make a decent living, educate their children, look after their families, and, if possible, save for the future. For decades that simple but profound state of economic safety and freedom became ever more widely attained, largely hand-in-hand with increased international openness. But we have been going mostly in the wrong direction on both counts since at least 2008, well before COVID-19. The economic and social impact of the pandemic has not just accelerated the corrosion of commerce and relationships across borders but also made undeniable the extreme vulnerability of the world’s population to disease, economic insecurity, and exclusion.

As a result, the risks of the most genuinely existential threats—climate change, technological slowdown, racial and gender-based oppression, digital disinformation and removal of privacy, aging populations, and the likely recurrence of epidemics—have risen. All of these threats are global, in that they are common to all humanity, and can be lastingly reduced only by global cooperative action. All of these threats are economic, in that beyond their direct human toll, their causes and lasting impact are meaningfully changed by our economic activities and policies. Both markets and international institutions have failed to deliver economic safety in the absence of global engagement by governments. Successful economic cooperation needs specific constructive policies with tangible deliverable results.

## Off –k

#### The Role of the Judge is to decide the virtue of Empire- with Apocalypse on the horizon, the question we must ask was whether it was all worth it.

**Grove 19** [Jarius, PoliSci at the University of Hawai’i. 2019. “Savage Ecology: War and Geopolitics in the Anthropocene.”] brackets for bad words // pat //rc sosa– ask me for the PDF

Because I wanted this book to inspire curiosity beyond the boundaries of international relations (ir), I considered ignoring the field altogether, removing all mentions of ir or ir theory. However, upon closer reflection, I have decided to keep these references as I think they are relevant for those outside the discipline and for those who, like myself, often feel alienated within its disciplinary boundaries. In the former case, it is important to know that, unlike some more humble fields, ir has always held itself to be a kind of royal science. Scholarship in ir, particularly in the United States, is half research, and half biding time until you have the prince’s ear. The hallowed names in the mainstream of the field are still known because they somehow changed the behavior of their intended clients—those being states, militaries, and international organizations. Therefore, some attention to ir is necessary because it has an all-too-casual relationship with institutional power that directly impacts the lives of real people, and ir is all too often lethal theory. As an American discipline, the political economy of the field is impossible without Department of Defense money, and its semiotic economy would be equally dwarfed without contributory figures like Woodrow Wilson, Henry Kissinger, and Samuel Huntington. The ubiquity of Huntington’s “clash of civilizations” thesis and Kissinger’s particular brand of realpolitik are undeniable throughout the field, as well as the world. Each, in their own way, has saturated the watchwords and nomenclature of geopolitics from an American perspective so thoroughly that both political parties in the United States fight over who gets to claim the heritage of each. Although many other fields such as anthropology and even comparative literature have found themselves in the gravitational pull of geopolitics, international relations is meant to be scholarship as statecraft by other means. That is, ir was meant to improve the global order and ensure the place of its guarantor, the United States of America. Having spent the better part of a decade listening to national security analysts and diplomats from the United States, South Korea, Japan, Europe, China, Brazil, and Russia, as well as military strategists around the planet, I found their vocabulary and worldview strikingly homogeneous.

If this seems too general a claim, one should take a peek at John Mearsheimer’s essay “Benign Hegemony,” which defends the Americanness of the ir field. What is most telling in this essay is not a defense of the U.S. as a benign hegemonic power, which Mearsheimer has done at length elsewhere. Rather, it is his vigorous defense that as a field, ir theory has done well by the world in setting the intellectual agenda for global challenges, and for creating useful theoretical approaches to addressing those problems. For Mearsheimer, the proof that American scholarly hegemony has been benign is that there is nothing important that has been left out. A quick scan of the last ten or twenty International Studies Association conferences would suggest otherwise.

That issues like rape as a weapon of war, postcolonial violence, global racism, and climate change are not squarely in the main of ir demonstrates just how benign American scholarly hegemony is not. As one prominent anthropologist said to me at dinner after touring the isa conference in 2014, “it was surreal, like a tour through the Cold War. People were giving papers and arguing as if nothing had ever changed.” These same provincial scholars aspire and succeed at filling the advisory roles of each successive American presidency. One cannot help but see a connection between the history of the ir field, and the catastrophes of U.S. foreign policy during the twentieth and twenty-first centuries. One could repeat the words of the anthropologist I mentioned to describe the 2016 presidential campaign debates over the future of U.S. foreign policy: it is as if “nothing had ever changed.” And yet these old white men still strut around the halls of America’s “best” institutions as if they saved us from the Cold War, even as the planet crumbles under the weight of their failed imperial dreams.

If international relations was meant to be the science of making the world something other than what it would be if we were all left to our own worst devices, then it has failed monumentally. The United States is once again in fierce nuclear competition with Russia. We are no closer to any significant action on climate change. We have not met any of the Millennium Development Goals determined by the United Nations on eradicating poverty. War and security are the most significant financial, creative, social, cultural, technological, and political investments of almost every nation-state on Earth. The general intellect is a martial intellect.

Despite all this failure, pessimism does not exist in international relations, at least not on paper. The seething doom of our current predicament thrives at the conference bar and in hushed office conversations but not in our research. In public, the darkness disavowed possesses and inflames the petty cynicisms and hatreds that are often turned outward at tired and predictable scapegoats.

After the fury of three decades of critique, most ir scholars still camp out either on the hill of liberal internationalism or in the dark woods of political realism. Neither offers much that is new by way of answers or even explanations, and each dominant school has failed to account for our current apocalyptic condition. One is left wondering what it is exactly that they think they do. Despite the seeming opposition between the two, one idealistic about the future of international order (liberals) and the other self-satisfied with the tragedy of cycles of war and dominance (realists), both positions are optimists of the positivist variety.

For both warring parties, ir optimism is expressed through a romantic empiricism. For all those who toil away looking for the next theory of international politics, order is out there somewhere, and dutifully recording reality will find it—or at least bring us closer to its discovery. For liberal internationalism, this will bring the long-heralded maturity of Immanuel Kant’s perpetual peace. For second-order sociopaths known as offensive realists, crumbs of “useful strategic insight” and the endless details that amplify their epistemophilia for force projection and violence capability represent a potential “advantage,” that is, the possibility to move one step forward on the global political board game of snakes and ladders. Still, the cynicism of ir always creeps back in because the world never quite lives up to the empirical findings it is commanded to obey. Disappointment here is not without reason, but we cynically continue to make the same policy recommendations, catastrophe after catastrophe.

I have an idea about where ir’s recent malaise comes from. I think it is a moment, just before the awareness of the Anthropocene, after the Cold War and before September 11, when the end of everything was only a hypothetical problem for those of a certain coddled and privileged modern form of life. The catastrophe of the human predicament was that there was no catastrophe, no reason, no generation-defining challenge or war. Now the fate of this form of life is actually imperiled, and it is too much to bear. The weird denial of sexism, racism, climate change, the sixth extinction, and loose nukes, all by a field of scholars tasked with studying geopolitics, is more than irrationalism or ignorance. This animosity toward reality is a deep and corrosive nihilism, a denial of the world. Thus ir as a strategic field is demonstrative of a civilization with nothing left to do, nothing left to destroy. All that is left is to make meaning out of being incapable of undoing the world that Euro-American geopolitics created. Emo geopolitics is not pretty, but it is real. The letdown, the failure, the apocalypse-that-was-not finally arrived, and we are too late.

Still, the United States of America continues to follow the advice of “the best and the brightest,” testing the imperial waters, not quite ready to commit out loud to empire but completely unwilling to abandon it. Stuck in between, contemporary geopolitics—as curated by the United States—is in a permanent beta phase. Neuro-torture, algorithmic warfare, drone strikes, and cybernetic nation-building are not means or ends but rather are tests. Can a polis be engineered? Can the human operating system be reformatted? Can violence be modulated until legally invisible while all the more lethal? Each incursion, each new actor or actant, and new terrains from brains to transatlantic cables—all find themselves part of a grand experiment to see if a benign or at least sustainable empire is possible. There is no seeming regard for the fact that each experiment directly competes with Thomas Jefferson’s democratic experiment. One wonders if freedom can even exist anywhere other than temporarily on the fringe of some neglected order. Is this some metaphysical condition of freedom, or is the world so supersaturated with martial orders that the ragged edges between imperial orders are all that we have left? It feels like freedom’s remains persist only in the ruins of everything else. No space is left that can be truly indifferent to the law, security, or economy. Such is the new life of a human in debt. The social contract has been refinanced as what is owed and nothing more: politics without equity. Inequity without equality.

What about the impending collapse of the post–World War II order, the self-destruction of the United States, the rise of China and a new world order? If humanity lasts long enough for China to put its stamp on the human apocalypse, I will write a new introduction. Until then, we live in the death rattle of Pax Americana. While I think the totality of this claim is true, I do not want to rule out that many of us throughout the world still make lives otherwise. Many of us even thrive in spite of it all. And yet, no form of life can be made that escapes the fact that everything can come to a sudden and arbitrary end thanks to the whim of an American drone operator, nuclear catastrophe, or macroeconomic manipulation like sanctions. There are other ways to die and other organized forms of killing outside the control of the United States; however, no other single apparatus can make everyone or anyone die irrespective of citizenship or geographic location. For me, this is the most inescapable philosophical provocation of our moment in time.

The haphazard and seemingly limitless nature of U.S. violence means that even the core principles of the great political realist concepts like order and national interest are being displaced by subterranean violence entrepreneurs that populate transversal battlefields, security corridors, and border zones. Mercenaries, drug lords, chief executive officers, presidents, and sports commissioners are more alike than ever. Doomsayers like Paul Virilio, Lewis Mumford, and Martin Heidegger foretold a kind of terminal and self-annihilating velocity for geopolitics’ technological saturation, but even their lack of imagination appears optimistic. American geopolitics does not know totality or finality; it bleeds, mutates, and reforms. Furthermore, the peril of biopolitics seems now almost romantic. To make life live? Perchance to dream. The care and concern for life’s productivity is increasingly subsumed by plasticity—forming and reforming without regard to the telos of productivity, division, or normative order.

There are, of course, still orders in our geoplastic age, but they are almost unrecognizable as such. When so many citizens and states are directly invested in sabotaging publicly stated strategic ends, then concepts like national interest seem equally quaint. We are witnessing creative and horrifying experiments in the affirmative production of dying, which also deprive those targeted and in some cases whole populations from the relief of death. To follow Rucker, I want to try to see the world for what it is. We can only say that tragedy is no longer a genre of geopolitics. Tragedy redeems. The occluded character of contemporary geopolitics shoehorned into experience produces the feeling that there is no relief, no reason, no victory, no defeats, and no exit within the confines of national security’s constricted world. This is not tragedy: it is horror. We live in an age of horror that, like the victims of gore movies who never quite die so that they can be tortured more, furthers our practice of collective violence and goes on for decades as a kind of sustainable warfare.

Why would I bother with the “night side” of ir theory? In part, I wish to move away from the rationalist fallacy among both defenders and critics of empire. There is a shared belief in the strategic competence of nations like the United States. Even those most vocally critical often see in the covert operations and vast military occupations a kind of purpose or conspiracy. The debate about empire then becomes about its moral virtue rather than the factual question of the strategic competence of imperial states. However, the lives of millions annihilated in Iraq, Yemen, Afghanistan, and now increasngly throughout the continent of Africa do not reflect an amoral strategic competence. The mass murder in pursuit of the war on terrorism and its vision of nation-building is the result of lethal ~~stupidity~~  [silliness].48 In some sense, the investigative journalism of Jeremy Scahill and Glen Greenwald attributes too much reason and order to the catastrophic floundering of the American empire.49 To see even a dark vision of order in the last thirty years of U.S. policy is itself a form of optimism. No one is in control, there is no conspiracy, and yet the killing continues. A pessimistic reading of U.S. empire and the geopolitical history that precedes it is neither tragedy nor farce. It is a catastrophic banality lacking in any and all history, a pile of nonevents so suffocating that we often hope for a conspiracy, punctuating event, or villain worthy of the Introduction—25 scale of violence.50 For those of us who continually rewatch the reruns of The Walking Dead and Jericho on our laptops in bed, we are waiting for relief in our privileged but increasingly fragile bubble. I know I am not the only one who finds respite from the weight of politics’ “cruel optimism” by watching fantasies of cruel pessimism. A pessimistic understanding of global politics helps explain how we could come to a place where there is a sense of relief in watching everything come to an end.5

#### The 1AC’s framing of satellites being the bastion of deterrence reifies insecurity, reinforcing conformation bias and a global pursuit of violence.

**Masco, 12** (Joseph, Prof. of Anthropology @ U. of Chicago, “The End of Ends” *Anthropological Quarterly*, Vol. 85, No. 4 (Fall 2012), pp. 1107-1124) ask for PDF // sosa

In an extreme age, we might well ask: what are the possibilities for a productive shock, an experience or insight that would allow us to rethink the terms of everyday life? In the discipline of biology, the recent discov- ery of microbial extremophiles in deep-sea volcanic vents has fundamen- tally challenged longstanding scientific definitions of life (Helmreich 2008). Living under conditions of extreme heat and pressure, these methane- eating beings have redefined the very limits of life on planet Earth and beyond. What could produce a similar effect in the domain of security? Opportunities for such a critique are ever present, an endless stream of moments in fact, yet constantly **subsumed by the normalizing effects** of a national security culture committed to a **constant state of emergency**. A return to basic questions of how to define profit, loss, and sustainability is a key concern today in the US and this paper asks what kind of analy- sis could begin to redefine the limits of a collective security? What kind of **de-familiarization** and/or **productive shock** might allow insight into the cultural terms of expert judgment today in the US, allowing us to **rethink** the logics and practices that have simultaneously produced a **global war on terror**, a global **financial meltdown**, **and a planetary climate crisis**? How can Americans- extremophiles of the national sort- assess their own his- tory within a national-cultural formation devoted to the **normalization of violence (as war, as boom and bust capitalism, as environmental ruin**) as the basis for everyday life? This short paper does not provide an answer to these questions (would that it could!), but rather seeks to offer a provocation and a meditation on paths constantly not taken in US national security culture. It asks: how can we read against the normalizing processes of the security state to assess **alternative futures,** alternative visions rendered invisible by the complex **logistics of military science, economic rationality**, and **global governance**? To do so is to break from the normalizing force of everyday national security/capitalism, and interrogate the assumed structures of security and risk that support a global American military deployment and permanent war posture. To accomplish this kind of critical maneuver, however, one needs to be able to recognize the **alternative futures rendered void** by the **specific configurations of politics and threat** empowering **military industrial action** at a given moment. An extreme critique requires the ability to assess the alternative costs and benefits that remain suspended within the spaces of an everyday American life constantly rehearsing (via media, political culture, and military action) terror as normality. What follows then is both an examination and a performance of extremity- pushing a critical history and theory well beyond the usual scholarly comfort level. It seeks less to settle and explain than to agitate and provoke. To engage an extreme point of view on crisis, both exterior and ob- jective, let's turn to a spectacular new technology that seemed to offer just such a perspective on US security culture in 1960- that of an exterior gaze on planet Earth. **The first satellite imagery** was not only a techno- logical revolution of profound importance to the military (and ultimately the earth and information sciences), it also **constituted a rare moment of ob- jective critique to** American Cold War fantasies at their most virulent and violent. Covert and extremely fragile, the first Corona satellite was secretly launched into outer space in August of 1 960, offering a new optics on Cold War military technologies and fantasies. Imagine, if you will, a rocket carrying not a warhead but a giant panoramic camera (see Figures 1 and 2), slung into a low orbit over Europe, running a long reel of 70mm film, spe- cially designed by Kodak to function in outer space. The satellite makes a series of orbits exposing its film over designated areas, and then ejects a fire-proof capsule carrying the film, sending it back into Earth's atmosphere (see Figure 3). As the capsule descends via a series of parachutes, it emits a homing signal, allowing a specially equipped plane to detect the signal and swoop in, capturing the now charred film canister in mid-air via a gi- ant hook (see Figure 4). On August 18, 1960 the Corona Project became the first space based reconnaissance system, providing the CIA with the first satellite photographs of Soviet military installations (see Figures 5 and 6; as well as Day, Logsdon, and Latell 1998; and Peebles 1997). Corona provided the most accurate images of Soviet military capabilities to date, offering concrete photographic evidence of Soviet missile capabilities at a time of near hysterical speculation about imminent Soviet attack. Soon US officials knew via photo- graphic documentation of commu- nist military bases that the Soviets did not have a vast and growing ICBM superiority capable of over- whelming US defenses. In fact, the US had something on the order of a ten to one advantage in missiles, and even more in nuclear devices. At this moment in the Cold War, **outer space provided the only clear view of nuclear threat- providing a series of photographs that dramatically changed how US officials viewed the immediacy of nuclear war** (Richelson 2006). Over the next decade, **the race to the moon became the public face of a covert enterprise to extend and expand space surveillance**. Plans for manned photographic studios in space with Hubble telescope- sized lenses pointed toward Earth, soon were enhanced by digital communications that allowed in- stant data transmission (see Willis and Bamford 2007). The Corona cameras evolved quickly, moving from the 40-foot resolution offered in 1960 to five-foot resolution by 1967, a revolution in optics that was soon followed by digital satellite systems capable of three-inch resolution, in- frared imaging, and the near instantaneous transfer of information. These remote sensing technologies have since revolutionized everything from geography, to climate sciences, to the now ubiquitous GPS systems and Google Earth. The Central Intelligence Agency (CIA) has long considered the Corona satellite one of its most im- portant achievements, a pure suc- cess story. As Director of the CIA, Richard Helms held a ceremony in honor of the Corona Program's re- tirement in 1 972 (in favor of the next generation digital satellite system). He presented a documentary film, entitled "A Point in Time" to CIA personnel detailing the crucial his- tory of the top-secret program, its technological achievements, and its central role in Cold War geopolitics. litics. A Corona capsule and an exten- sive photographic display of Corona satellite imagery was then centrally installed at CIA Headquarters in Langley to document its success for all future employees. On display there through the end of the Cold War, com- ponents of this exhibit can now be seen at the Smithsonian Air and Space Museum. The extensive Corona photographic archive became available Corona as a fantastically successful covert spy system and others today value its photographic record for non-military scientific research, a basic lesson of the Corona achievement remains unrecognized: the first satellite system not only offered a new optic on Soviet technology, it also revealed how fantastical American assessments of Soviet capabilities were in the 1 950s. It offered a new remote viewing photography but also new insight into the American national security imaginary. The first Corona images have as much to say about the ferocious US commitment to nuclear weapons and a global nuclear war machine already set on a minute-to-minute trig- ger by 1960, as about Soviet weapons. The first Corona images contra- dicted expert US judgments of Soviet capabilities and desires, providing a powerful counterweight against arguments for a preemptive US attack on the Soviet Union. The slightly blurry satellite photographs thus held the potential for a radical critique of American perceptions of the Soviet Union, showing that US officials were as much at war with their own apocalyptic projections in 1 960 as with Soviet plans for territorial expansion. An anthropology of extremes requires a non-normative reading of cul- ture and history, an effort to push past consensus logics to interrogate what alternative visions, projects, and futures are left unexplored at a given historical moment. The rapidly evolving historical archive provides one op- portunity for this kind of critique: our understanding of the 20th century American security state is changing with each newly declassified program and document, dramatically reshaping what we know about US policy, mil- itary science, and threat assessments since World War II. The Corona pho- tographs are a compelling illustration of the power of the evolving national security archive. As the enormous military state apparatus that constitutes the core of the American political and economic machine is grudgingly opened to new kinds of conceptual interrogation, Americans should seize the opportunity to learn about their own commitments, political processes, and security imaginaries. Indeed, the national security archive is one place where we can formally consider how the 20th century "balance of terror" has been remade in the 21st century as a "war on terror"- following the affective politics, technological fetishisms, and geopolitical ambitions that have come to structure US security culture. The declassified Cold War ar- chive allows us to pursue an extreme reading of US security culture, one committed to pushing past official policy logics at moments of heightened emergency to consider how threat, historical contingency, technological revolution, propaganda, and geopolitical ambition combine in a specific moment of extreme risk. The first Corona images, for example, constitute a moment when administrators of the national security state had their own logics and fears negated in the form of direct photographic evidence, opening a potential conceptual space for radical reassessment of their own ambitions, perceptions, and drives, powerfully revealed in black and white photos as fantasy. We might well ask why the Corona imagery (and any number of similar moments when existential threat has objectively dissolved into mere projection**- most** recently, the missing weapons of mass destruction used to justify the US invasion of Iraq in 2003)- did not pro- duce a radical self-critique **in the US**. The Cold War nuclear standoff installed **existential threat as a core structure of everyday American life**, making nuclear fear the coordinat- ing principle of US geo-policy and a **new psychosocial reality** for citizens increasingly connected via images of their own imminent death. Indeed, few societies have prepared so meticulously for collective death as did Cold War America while simultaneously denying the possibility of an ac- tual ending. From large scale civil defense drills in which the destruction of the nation-state became a kind of public theater, to the articulation of a Cold War militarism that understood all global political events as condi- tioning everyday American life, the height of the Cold War worked in novel ways both to enable and deny the possibility of a collective death (Masco 2008). **The early history of the Corona Satellite System offers a compel- ling story about the technological achievement of a total ending, and the Cold War hysteria of the years 1957-1962 in the US**. This is a moment of maximal danger but also of new perspectives- crucially those derived from outer space- that momentarily opened up multiple contingent and radically different security futures. For an anthropology of extremes, this period of Cold War can be approached as an ur-moment; foundational in terms of the technology, theory, politics, and ambitions supporting the American security state. Interrogating this first period of global nuclear danger via recently declassified materials allows us to ask: how does one end the possibility of a total ending? How does a society pursuing war as a normalized condition of everyday life pause and reflect on its own intel- lectual and psychosocial processes? Within modern political theory the means to an end has been embed- ded within the very concept of rationality, making ends and means syn- onymous with progress, a perpetual engine of improving the infrastruc- tures of everyday life as well as the morality of those living within it. Within this modernity- glossed here as the application of reason to nature as progress- we have few efforts to theorize the reality or implication of con- ceptual blockages or blindnesses within the very notion of security. The assumption that instrumental reason is not only a means to an end but an essential good structures a Euro-American modernity in which supersti- tion is set against the possibility of an unending technological progress (Horkheimer and Adorno 2002:1). Benjamin (1969) offers perhaps the most powerful critique of "progress" by showing how the promise of the "new" can be the vehicle of social mystification and entrenchment. His call to "brush history against the grain" and establish a critical method that can "seize hold of a memory as it flashes up at a moment of danger" is ultimately a call to resist the normalization (and naturalization) of violence in everyday life. But how, and under what terms, can this be accomplished in a national security state that is premised on the total ending of nuclear war? Having built the war machine as a global system, how can a society turn towards an alternative notion of security, one not grounded in the technological possibility of total nuclear war? How, indeed, does thinking about an absolute ending work to install a new set of fantasies and short circuits that prevent reflexive critique? How do rational modes of planning work not to eliminate the possibility of collective death but rather, through self-mystification, to install its pos- sibility ever deeper into an expert state system? Kant (1986) articulated one central area where reason is installed as a compensation for a lack of understanding in his notion of the sublime. Sublime experience, in his view, overwhelms the human sensorium providing that strange mix of pleasure and terror involved in surpassing one's cognitive limit. For Kant, the experi- ence of incomprehensibility is then managed by an act of categorizing- by a naming of the event- rather than through understanding. Compensation rather than comprehension is thus achieved, installing at the very center of his notion of reason an irreducible problem about means, ends, and the ability of human beings in extreme moments to comprehend both. "Terror" has an inherent sublimity, one that has been multiplied across contempo- rary crisis- war, economy, environment- to create a new complex con- figuration of planetary risk that exceeds the power of the national security state (Masco 201 0). Nuclear terror, as a permanent state system, however, is not a momentary experience (as Kant's sublime requires) but is instead a global infrastructure- one that coordinates American military power as well as its domestic politics. This infrastructure requires constant affective as well as technological support, merging complex social and technologi- cal processes that become fused in perceptions of global risk. Put differently, instrumental reason has orchestrated our globalized, economized, technologized modernity but it has also installed a set of compensations for those events, desires, and biological facts that dis- rupt specific calculations of progress/profit. By the mid-20th century, the products of instrumental reason- the very means to an end- produced new forms of war that ultimately challenged the survival of the species. The atomic bomb stands as both a rational technology- produced via the combined work of physicists, engineers, chemists, industrialists, military planners, defense intellectuals, and civilian policy makers- and as a limit case to that instrumental reason (see Edwards 1996, Oakes 1994). In the early days of the nuclear age, some Manhattan Project scientists hoped this new technology would be so terrible that it would simply end the pos- sibility of war (e.g., Federation of American Scientists 1946). Instead, US war planners built a global system for nuclear war that could end life itself within a few minutes of actual conflict. Each new nuclear system- bomb- er, submarine, and missile- was both a technological achievement of the first order and an accelerating progression towards the end of modernity in the form of nuclear war. What these technical experts were attempting to negotiate through engineering is a basic relationship to death, a perverse project of build- ing ever more destructive machines in the name of producing "security." Indeed, **displacing** the threat of **one machine** (the bomb) with another (the bomb) became the basis for **deterrence theory, a way of organizing and containing the thought of death by expanding technological systems**. Freud (1991) saw this contradiction in militarism early on, and in his remarkable 1915 essay "Thoughts for the Times on War and Death" he is definitive that it is impossible to comprehend- to actually believe in- one's own death. Thus, he notes, even as the human organism moves closer to death with each tick of the clock, the ego pursues a program of immortality and works **to relocate the** onrushing **reality of death to exterior locations**- to novels, to foreign populations, to distant wars, **to a radical outside**. Thus, the thought of an "ending" here literally pro- duces a new set of means- fantasies, projections, displacements, and amnesias all mobilized to suture together an idea of an eternal self. In American national-culture, the Cold War performed this task through a series of circuits: the communist threat was simultaneously everywhere and nowhere, and the immanent threat of nuclear war was mitigated by a fetishistic focus on technological detail. Cold War planners managed the threat of nuclear war through constant proliferation- of weapons, deliv- ery systems, images, theories, and calculations. Through this prolifera- tion, Cold War planners pursued a program of intellectual compensation for the confrontation with a new kind of death. They did so by mobilizing all national resources (changing the very temporal horizon of war from days, to hours, to minutes in the process), as well as by pursuing proxy wars and covert actions around the world. In the process, Americans learned how to be committed to total war as a precondition for everyday life while locating death as exterior to the nation, even as the war machine grew ferociously in its technological capacities. This represents a distinc- tive national-cultural achievement: a notion of security that brings collective death ever closer in an attempt to fix its location with ever more precision. By the time of the first Corona photograph, the US nuclear system was on constant and permanent alert, managing a global war machine on a minute-by-minute temporal scale- one that imagined a Soviet nuclear strike coming with less than seven minutes warning (Keeney 201 1 :1 86).

#### Voting negative adopts failed IR for a healthy dose of pessimism – at the end of the world, all we can do is be buried alive together.

Grove ‘19

[Jarius, PoliSci at the University of Hawai’i. 2019. “Savage Ecology: War and Geopolitics in the Anthropocene.”] pat // rc sosa– ask for pdf

Failed ir affirms the power of this kind of negative thinking as an alternative to the endless rehearsing of moralizing insights and strategic foresight. The negative is not “against” or reacting to something. Rather, it is the affirmation of a freedom beyond the limits of life and death. That is, it is making a life by continuing to think about the world, even if that thinking is not recuperative, and even if nothing we think can save us. In the face of it all, one celebrates useless thinking, useless scholarship, and useless forms of life at the very moment we are told to throw them all under the bus in the name of survival at all costs. This is a logic referred to lately as hope and it is as cruel as it is anxiety inducing. Hope is a form of extortion. We are told that it is our obligation to bear the weight of making things better while being chided that the failure of our efforts is the result of not believing in the possibility of real change. In such an environment, pessimism is often treated as a form of treason, as if only neoliberals and moral degenerates give up—or so goes the op-ed’s insisting upon the renewed possibility of redemption.

In response to these exhortations, pessimism offers a historical atheism, both methodologically and morally. The universe does not bend toward justice. Sometimes the universe bends toward the indifference of gravity wells and black holes. Affirming negativity, inspired by Achille Mbembe, is grounds for freedom, even if that freedom or relief is only fleeting and always insecure. I am not arrogant enough to think a book can attain freedom of this sort, but this book is inspired by refusals of critique as redemption in favor of useless critique and critique for its own sake.

That the pursuit of knowledge without immediate application is so thoroughly useless, even profane, is a diagnosis of our current moment. The neoliberal assault on the university is evidence of this condition, as is the current pitch of American politics. Our indifference as intellectuals to maximizing value has not gone unnoticed. We are still dangerous, worthy of vilification, of attack, sabotage, and derision because we fail so decadently. We are parasites according to Scott Walker, Donald Trump, and the rest. So be it. We are and shall remain irascible irritants to a worldwide assault on thinking that is well underway and facing few obstacles in other jurisdictions.

What would failed scholarship do? Learn to die, learn to live, learn to listen, learn to be together, and learn to be generous. These virtues are useless in that they do not prevent or manage things. They do not translate into learning objectives or metrics. Virtues of this order are selfsame, nontransferable experiences. They are meaningful but not useful. These are luxurious virtues. Like grieving or joy, they are ends unto themselves. But how will these ideas seek extramural grants, contribute to an outcomes-based education system, or become a policy recommendation? They will not, and that is part of their virtue.

Even if there is no straight line to where we are and where we ought to be, I think we should get over the idea that somehow the U.S. project of liberal empire is conflicted, or “more right than it is wrong,” or pragmatically preferable to the alternatives. I hope this book can contribute to the urgent necessity to get out of the way by reveling in the catastrophic failure that should inspire humility but instead seems to embolden too many to seek global control yet again. Demolition may be an affirmative act if it means insurgents and others can be better heard. And yet this may fail too. If we can accomplish nothing at all, we can at least, as Ta-Nehisi Coates and other pessimists have said, refuse to suborn the lie of America any longer. Telling the truth, even if it cannot change the outcome of history, is a certain kind of solace. In Coates’s words, there is a kind of rapture “when you can no longer be lied to, when you have rejected the dream.” Saying the truth out loud brings with it the relief that we are not crazy. Things really are as bad as we think.

If there are those of us who want to break from this one-hundred-year-old race to be the next Henry Kissinger, then why do we continue to seek respect in the form of recognizable standards of excellence? I am not sure where the answer finally lies, but I do know that professionalization will not save us. To appear as normal and recognizably rigorous will not be enough to stave off the neoliberal drive to monetize scholarship, or to demand of us strategically useful insights. The least we can do in the face of such a battle is to find comfort in meaningful ideas and the friendships they build rather than try to perform for those we know are the problem. Some will ask, who is this “we” or is that “they”—where is your evidence? More will know exactly what I am talking about.

The virtues I seek are oriented toward an academy of refuge, a place we can still live, no matter how dire the conditions of the university and the classroom. It is not the think tank, boardroom, or command center. We are, those of us who wish to be included, the last of the philosophers, the last of the lovers of knowledge, the deviants who should revel in what Harney and Moten have called the undercommons.

In one of his final lectures, Bataille speaks of the remnants of a different human species, something not quite so doomed, something that wasted its newly discovered consciousness and tool-being on the art that still marks the walls of prehistoric caves. This lingering minor or vestigial heritage is philosophy’s beginning. Philosophy survives war, atrocity, famine, and crusades. Thinking matters in a very unusual way. Thinking is not power or emancipation. Thinking matters for a sense of belonging to the world, and for believing in the fecundity of the world despite evidence to the contrary.

How do you get all this from pessimism, from failure? Because willing failure is a temptation, a lure to think otherwise, to think dangerous thoughts. Pessimism is a threat to indifferentism and nihilism in the sense of the phenomenon of Donald Trump. Pessimism is a provocation and an enemy of skepticism, particularly of the metaphysical variety. It is not redemption from these afflictions, but in pessimism there is solace in the real. To put it another way, to study the world as it is means to care for it.

The exhortation that our care or interest should be contingent on how useful the world is and how much of it conforms to our designs is as much opposed to care as it is to empiricism. We can study airports, poetry, endurance races, borders, bombs, plastic, and warfare, and find them all in the world. To consider the depth of their existence can be an invitation to the world rather than a prelude to another policy report. One cannot make a successful political career out of such pursuits, but you might be able to make a life out of it, a life worth repeating even if nothing else happens.

At the end of Jack Halberstam’s The Queer Art of Failure, we are presented with the Fantastic Mr. Fox’s toast as an exemple of something meaningful in these dark times of ours.

They say all foxes are slightly allergic to linoleum, but it’s cool to the paw—try it. They say my tail needs to be dry cleaned twice a month, but now it’s fully detachable—see? They say our tree may never grow back, but one day, something will. Yes, these crackles are made of synthetic goose and these giblets come from artificial squab and even these apples look fake—but at least they’ve got stars on them. I guess my point is, we’ll eat tonight, and we’ll eat together. And even in this not particularly flattering light, you are without a doubt the five and a half most wonderful wild animals I’ve ever met in my life. So let’s raise our boxes—to our survival.

Halberstam says of this queer moment:

Not quite a credo, something short of a toast, a little less than a speech, but Mr. Fox gives here one of the best and most moving—both emotionally and in stop-motion terms—addresses in the history of cinema. Unlike Coraline, where survival is predicated upon a rejection of the theatrical, the queer, and the improvised, and like Where the Wild Things Are, where the disappointment of deliverance must be leavened with the pragmatism of possibility, Fantastic Mr. Fox is a queerly animated classic in that it teaches us, as Finding Nemo, Chicken Run, and so many other revolting animations before it, to believe in detachable tails, fake apples, eating together, adapting to the lighting, risk, sissy sons, and the sheer importance of survival for all those wild souls that the farmers, the teachers, the preachers, and the politicians would like to bury alive.

Although not as much fun as Halberstam’s monument to low theory, Savage Ecology is for all the other wild animals out there studying global politics. May we be buried alive together.

## Case

### 1NC – Framing

#### Duval ev – the k is IR education, case defense will answer this but the k turns it bc it makes a root cuase claim of war

### 1NC – Solvency

#### 1] plan flaw -- vagueness ensures circumvention -- they don't explain what space debris is or how it amounts to appropriation, or delineate what activities lead to appropriation and how the various policies they defined mitigate that. , companies don’t care – backlash exists in the squo

#### The shah 20 ev under the plan just says things that produce debris is bad – which means companies circumvent by claiming they wont collide

#### Long time frame.

Burns Interviewing Kessler **’**13 Corrinne Burns, interviewing Donald Kessler, who made up the concept. [Space junk apocalypse: just like Gravity? 11-15-2013, https://www.theguardian.com/science/blog/2013/nov/15/space-junk-apocalypse-gravity]//BPS

Now? Are we in trouble? Not yet. Kessler syndrome isn't an acute phenomenon, as depicted in the movie – it's a slow, decades-long process. "It'll happen throughout the next 100 years – we have time to deal with it," Kessler says. "The time between collisions will become shorter – it's around 10 years at the moment. In 20 years' time, the time between collisions could be reduced to five years." Fortunately, communications satellites are, in the main, situated high up in geosynchronous orbit (GEO), whereas the risk of collisions lies mainly in the much lower, and more crowded, low Earth orbit (LEO). But that doesn't mean we can relax. "We've got to get a handle on it – we need to prevent the cascade process from speeding up." And the only way to do that is, he says, to begin actively removing junk from space. Charlotte Bewick agrees. She's a mission concepts engineer with the German space technology company OHB System, with special expertise in space junk – specifically, how we can capture it and bring it back to Earth. While agreeing with Kessler that the movie scenario is exaggerated, she remains concerned. "Fragments of junk can naturally re-enter the atmosphere [and so be removed from orbit]. But we're at the stage where the rate of creation of new debris fragments is higher than the rate of natural removal. The orbits most at risk harbour important space assets – satellites for weather forecasting, oil spill and bush fire detection, and polar ice monitoring." Bewick highlights the case of Envisat, a defunct 8,000kg spacecraft circling Earth in an orbit that is very popular with space agencies and, hence, pretty crowded. "If Envisat collides with a piece of debris or a micrometeorite, the fragments could render the whole orbital region unusable." So can we get the junk down, I asked Massimiliano Vasile, part of the Mechanical & Aerospace Department at the University of Strathclyde and co-ordinator of the Stardust network. He told me defunct satellites in the high GEO region have, for some time, been shifted to higher "graveyard orbits" to keep them out of the way. But that's not an option for items in low Earth orbit. For this, he tells me, researchers are looking seriously into active debris removal – in-orbit capture techniques like harpooning, netting and tethering, the use of contactless systems like ion-beams or lasers, and even onboard robotics to position the junk away from high-risk orbital regions. As for middle Earth orbit – well, ideas are welcome, he says. We're in no immediate danger from Kessler syndrome – but it's not a problem that's going away. Despite Gravity's artistic license, Donald Kessler is pleased to see the phenomenon represented on the big screen. "It is very improbable that events would play out as they did in the film," he says. "But if it raises awareness, then that's great."

### 1NC – Space war

#### No space war -- Official statements prove

Colby 16 (Elbridge, Senior Fellow at the Center for a New American Security, “From Sanctuary to Battlefield: A Framework for a U.S. Defense and Deterrence Strategy for Space”)SLAIR

But such a threat is of substantially decreasing credibility. In today’s much different context, no one really believes that a limited space attack would necessarily or even plausibly be a prelude to total nuclear war. Would the United States respond with a major strategic strike if China or Russia, in the context of a regional conflict with the United States, struck discriminately at implicated U.S. space assets in the attempt to defang U.S. power projection, all while leaving the broader U.S. space architecture alone? Not only does such a massive response seem unlikely – it would be positively foolish and irresponsible. Furthermore, would other nations regard attacks on assets the United States was actively employing for a local war as off limits to attack? Indeed, any reasonable observer would have to judge that such discriminate attacks on U.S. space assets would not necessarily be illegitimate, as, by the United States’ own admission, it relies greatly on its space architecture for conventional power projection. Moreover, official U.S. statements on how the United States would respond to attacks on its space assets – to the limited extent such statements exist and the degree to which those given are clear – offer no indication it would respond massively to such strikes.53 Perhaps more to the point, senior responsible U.S. officials have telegraphed that the United States would indeed not necessarily respond massively to attacks against its space assets.54 In light of these factors, any U.S. space deterrence strategy that is predicated on an all-or-nothing retaliation to space attacks will become increasingly incredible and thus decreasingly effective – and indeed might even invite an adversary’s challenge in order to puncture or degrade U.S. credibility. In other words, since space assets can increasingly be attacked segmentally and discriminately rather than totally, this means that credibly and effectively deterring such attacks requires a less than total response. Since the threat is more like a rapier than a broadsword, the United States needs rapier-like ripostes of its own. Accordingly, the United States Any U.S. space deterrence strategy that is predicated on an all-or-nothing retaliation to space attacks will become increasingly incredible and thus decreasingly effective. needs a more discriminate deterrent for space. In particular, it needs a flexible deterrent capable of meeting the intensifying challenge of deterring an adversary – and particularly a highly capable potential opponent like China or Russia – from attacking (or attacking to a sufficient degree) those U.S. space assets needed for the United States to effectively and decisively project power and ultimately prevail in a conflict in a distant theater. At the same time, this flexible deterrent must contribute to dissuading such an enemy from striking at the nation’s broader military and civilian space architecture, and in particular those core strategic space assets needed for central deterrence.

#### Even absent treaty cred, no space war—interdependence checks.

Bragg et al 18—(principle research scientist at NSI, Inc. Lecturer in polisci @ Texas A&M). , July 2018.. Allison Astorino-Courtois. Robert Elder. Belinda Bragg. “Contested Space Operations, Space Defense, Deterrence, and Warfighting: Summary Findings and Integration Report,” NSI, <https://nsiteam.com/social/wp-content/uploads/2018/11/Space-SMA-Integration-Report-Space-FINAL.pdf>

Everyone needs space While the US may be relatively more dependent on space for national security than are other states, it is far from alone in relying on space. Nuclear armed states are dependent on space for important command and control functions, and major powers are increasingly using space for battlefield situational awareness and communications. China and Russia were identified as having significant (and fairly equal) levels of strategic risk in space (ViTTa Q16), although their regional security priorities and (to date) less spacedependent economies place them at an advantage to the US. They may, therefore, see the strategic risk of conflict is space as lower than does the US. Still, space capabilities remain a source of economic expansion and national pride for both, and their calculations of the cost of conflict involving space may include consideration of these factors. Even now, there is a general consensus that the US and other actors have more to gain from space than they have from the loss of space-based capabilities (ViTTa Q3). This suggests that, although the US is more vulnerable in the space domain than are other states, the likelihood that aggressive action against an adversary’s space assets would be reciprocated may provide a degree of security. It also creates another incentive for actors to use diplomacy and international law to reduce risk and increase transparency in the space domain.

#### No miscalc from satellite disruptions, but terrestrial conflict turns it

Mazur 12 (Jonathan Mazur, Manager Engineering at Northrop Grumman, writing in Space & Defense, from the Eisenhower Center for Space and Defense Studies. Past U.S. Actions: Redlines in Space. Space & Defense, Volume 6, Number 1, Fall 2012. https://inss.ndu.edu/Portals/97/Space\_and\_Defense\_6\_1.pdf?ver=2018-09-06-135424-147)

U.S. Reactions To Foreign Disruption Of U.S. Capabilities

In the 1970s, it was suspected that a U.S. maritime communications satellite was turned off by the Soviets when it was outside of the range of U.S. tracking stations.25 There does not appear to be any documented U.S. reaction, and I suspect there was none. In the mid-1990s, satellite hackers in Brazil began hijacking U.S. military communication satellite signals to broadcast their own information, though it took until 2009 for Brazil to crack down on the illegal activity with the support of the DoD.26 In 1998, a U.S.-German satellite known as ROSAT was rendered useless after it turned suddenly toward the sun. NASA investigators later determined the accident was possibly linked to a cyber-intrusion by Russia.

The fallout? Though there was an ongoing criminal investigation as of 2008; NASA security officials have seemed determined to publicly minimize the seriousness of the threat.27 In 2003, a signal originating from Cuba—later determined to be coming from Iranian embassy property— was jamming a U.S. communications satellite that was transmitting Voice of America programming over Iran, which was publicly referred to as an “act of war” by a U.S. official. 28 Press reporting indicates the U.S. administration was [frozen]“paralyzed” about how to cope with the jamming that continued for at least a month, even after U.S. diplomatic protests to Cuba.29 In 2005, U.S. diplomats protested to the Libyan government after two international satellites were illegally jammed disrupting American diplomatic, military, and FBI communications.30 In 2006, press reporting indicates that China hit a U.S. spy satellite with a ground-based laser. This action was acknowledged by the then director of the NRO, though the DoD remained tight lipped about the incident.31

“We’re at a point where the technology’s out there, and the capability for people to do things to our satellites is there. I’m focused on it beyond any single event.” – Air Force Space Command Commander, General Chilton, 2006 32

In 2009, a U.S. commercial Iridium communications satellite—extensively used by the DoD—was accidently destroyed by a collision with a dead Russian satellite.33 The U.S. company, Iridium, was able to minimize any loss of service by implementing a network solution within a few days.34 As of early 2011, no legal action had been taken by the company either because it is not clear who was at fault or because it might be politically problematic for the United States, which is trying to enter into bi-lateral transparency and confidence-building measures (TCBM) with Russia regarding space activities.35 Since August of 2010, North Korea has been intermittently using GPS jamming equipment, which reportedly has been interfering with U.S. and South Korean military operations and civilian use south of the North Korean border.36 Reportedly, only South Korea and the United Nations International Telecommunications Union—at the request of South Korea—have issued letters to Pyongyang demanding the cessation of disruptive communications signals in South Korea.37

It appears that the only time the U.S. military has responded with force to a disruption in U.S. space capabilities was in 2003, a few days after the start of the Iraq war.38 According to U.S. officials, Iraq was using multiple GPS jammers—which supposedly did not affect military GPS functionality. However, the U.S. military bombed the jammers anyway after a diplomatic complaint to Russia.39 The use of military force against the GPS jamming threat was possibly because the United States was already intervening in Iraq, and the bombing probably would not have occurred if the United States was not at war.

### 1NC – Ozone

#### No ozone impact

Ridley 14 -- Matthew White Ridley, 5th Viscount Ridley DL FRSL FMedSci, known commonly as Matt Ridley, is a British journalist, businessman and author of popular science books. Since 2013 Ridley has been a Conservative hereditary peer in the House of Lords. “THE OZONE HOLE WAS EXAGGERATED AS A PROBLEM” <http://www.rationaloptimist.com/blog/the-ozone-hole-was-exaggerated-as-a-problem.aspx>

**Serial hyperbole does the environmental movement no favours** My recent [Times column](http://www.thetimes.co.uk/tto/opinion/columnists/article4206440.ece) argued that the alleged healing of the ozone layer is exaggerated, but so was the impact of the ozone hole over Antarctica: The ozone layer is healing. Or so said the news last week. Thanks to a treaty signed in Montreal in 1989 to get rid of refrigerant chemicals called chlorofluorocarbons (CFCs), the planet’s stratospheric sunscreen has at last begun thickening again. Planetary disaster has been averted by politics. For reasons I will explain, this news deserves to be taken with a large pinch of salt. You do not have to dig far to find evidence that the ozone hole was never nearly as dangerous as some people said, that it is not necessarily healing yet and that it might not have been caused mainly by CFCs anyway. The timing of the announcement was plainly political: it came on the 25th anniversary of the treaty, and just before a big United Nations climate conference in New York, the aim of which is to push for a climate treaty modelled on the ozone one. Here’s what was actually announced last week, in the words of a Nasa scientist, Paul Newman: “From 2000 to 2013, ozone levels climbed 4 per cent in the key mid-northern latitudes.” That’s a pretty small change and it is in the wrong place. The ozone thinning that worried everybody in the 1980s was over Antarctica. Over northern latitudes, ozone concentration has been falling by about 4 per cent each March before recovering. Over Antarctica, since 1980, the ozone concentration has fallen by [40 or 50 per cent each September](http://bigstory.ap.org/article/scientists-say-ozone-layer-recovering) before the sun rebuilds it. So what’s happening to the Antarctic ozone hole? Thanks to a diligent blogger named Anthony Watts, I came across a press release also from Nasa about nine months ago, which said: “ [Two new studies show](http://wattsupwiththat.com/2014/09/12/is-the-atmospheric-ozone-recovery-real-or-just-for-scoring-political-points/) that signs of recovery are not yet present, and that temperature and winds are still driving any annual changes in ozone hole size.” As recently as 2006, Nasa announced, quoting Paul Newman again, that the Antarctic ozone hole that year was “the largest ever recorded”. The following year a paper in Nature magazine from Markus Rex, a German scientist, presented new evidence that suggested CFCs may be responsible for less than 40 per cent of ozone destruction anyway. Besides, nobody knows for sure how big the ozone hole was each spring before CFCs were invented. All we know is that it varies from year to year. How much damage did the ozone hole ever threaten to do anyway? It is fascinating to go back and read what the usual hyperventilating eco-exaggerators said about ozone thinning in the 1980s. As a result of the extra ultraviolet light coming through the Antarctic ozone hole, southernmost parts of Patagonia and New Zealand see about 12 per cent more UV light than expected. This means that the weak September sunshine, though it feels much the same, has the power to cause sunburn more like that of latitudes a few hundred miles north. Hardly Armageddon. The New York Times reported “an increase in Twilight Zone-type reports of sheep and rabbits with cataracts” in southern Chile. Not to be outdone, Al Gore wrote that “hunters now report finding blind rabbits; fisherman catch blind salmon”. Zoologists briefly blamed the near extinction of many amphibian species on thin ozone. [Melanoma in people](http://www.wunderground.com/resources/climate/holefaq.asp?MR=1) was also said to be on the rise as a result. This was nonsense. Frogs were dying out because of a fungal disease spread from Africa — nothing to do with ozone. Rabbits and fish blinded by a little extra sunlight proved to be as mythical as unicorns. An eye disease in Chilean sheep was happening outside the ozone-depleted zone and was caused by an infection called pinkeye — nothing to do with UV light. And melanoma incidence in people actually levelled out during the period when the [ozone got thinner](http://www.heritage.org/research/commentary/2007/09/ozone-the-hole-truth). Then remember that the ozone hole appears when the sky is dark all day, and over an uninhabited continent. Even if it persists into the Antarctic spring and spills north briefly, the hole allows 50 times less ultraviolet light through than would hit your skin at the equator at sea level (let alone at a high altitude) in the tropics. So it would be bonkers to worry about UV as you sailed round Cape Horn in spring, say, but not when you stopped at the Galapagos: the skin cancer risk is 50 times higher in the latter place. This kind of eco-exaggeration has been going on for 50 years. In the 1960s Rachel Carson said there was an epidemic of childhood cancer caused by DDT; it was not true — DDT had environmental effects but did not cause human cancers.

**Warming alt cause – its warranted by thehir own impact card that warming causes ozone depeltion**

#### humans can survive post-collapse.

Hough 14 [Rupert, Environmental Scientist with Expertise in Risk Modelling and Exposure Assessment and PhD from Nottingham University, February, “Biodiversity and human health: evidence for causality?” Biodiversity and Conservation, Vol. 23 No. 2, pg. 272-3/AKG]

Large country-level assessments (e.g. MEA 2005; Huynen et al. 2004; Sieswerda et al. 2001) must be interpreted with some caution. Data measured at country-level are likely to mask regional and local-level effects. Apart from the fact that there are limitations to regression analysis in providing any proof of causality, least squares regression models assume linear relationships between reductions in biodiversity and human health and thus imply a linear relationship between loss of biodiversity and the provision of relevant ecosystem goods and services. A number of authors, however, have suggested that ecosystems can lose a proportion of their biodiversity without adverse consequences to their functioning (e.g. Schwartz et al. 2000). Only when a threshold in the losses of biodiversity is reached does the provision of ecosystem goods and services become compromised. These models also tend to assume a positive relationship between socio-economic development and loss of biodiversity. One problem with this expectation is that the loss in biodiversity in one country is not per definition the result of socio-economic developments in that particular country, but could also be the result of socio-economic developments in other parts of the world (Wackernagel and Rees 1996). Furthermore, the use of existing data means researchers can only make use of available indicators. Unlike for human health and socio-economic development, there are no broadly accepted core-set of indicators for biodiversity (Soberon et al. 2000). The lack of correlation between biodiversity indicators (Huynen et al. 2004) shows that the selected indicators do not measure the same thing, which hinders interpretation of results. Finally, there is likely to be some sort of latency period between ecosystem imbalance and any resulting health consequences. To date, this has not been investigated using regression approaches. Finally, it is thought that provisioning services are more crucial for human health and well-being that other ecosystem services (Raudsepp-Hearne et al. 2010). Trends in measures of human well-being are clearly correlated with food provisioning services, and especially with meat consumption (Smil 2002). While \*60 % of the ecosystem services assessed by the MEA were found to be in decline, most of these were regulating and supporting services, whereas the majority of expanding services were provisioning services such as crops, livestock and aquaculture (MEA 2005). Raudsepp-Hearne et al. (2010) investigated the impacts on human well-being from decreases in non-food ecosystem services using national-scale data in order to reveal human well-being trends at the global scale. At the global scale, forest cover, biodiversity, and fish stocks are all decreasing; while water crowding (a measure of how many people shared the same flow unit of water placing a clear emphasis on the social demands of water rather than physical stress (Falkenmark and Rockstro¨m 2004)), soil degradation, natural disasters, global temperatures, and carbon dioxide levels are all on the rise, and land is becoming increasingly subject to salinization and desertification (Bennett and Balvanera 2007). However, across countries, Raudsepp-Hearne et al. (2010) found no correlation between measures of wellbeing and the available data for non-food ecosystem services, including forest cover and percentage of land under protected-area status (proxies for many cultural and regulating services), organic pollutants (a proxy for air and water quality), and water crowding index (a proxy for drinking water availability, Sieswerda et al. 2001; WRI 2009) This suggests there is no direct causal link between biodiversity decline and health, rather the relationship is a ‘knock-on’ effect. I.e. if biodiversity decline affects mankind’s ability to produce food, fuel and fibre, it will therefore impact on human health and well-being. As discussed in the introduction, the fact that humans need food, water and air to live is an obvious one. All these basic provisions can be produced in a diversity-poor environment. Therefore, to understand whether there is a potential causality relationship between biodiversity in its own right and human health, we need to move beyond the basic provisioning services.

### 1NC – Grid

#### Tons of alt causes to grid collapse and no impact

NASEM 17 National Academies of Sciences, Engineering, Medicine, “Enhancing the Resilience of the Nation's Electricity System”, 2017, <https://www.nap.edu/read/24836/chapter/5#66> // ella

Reviewing the causes of outages Earthquake Moving through Figure 3.1 from left to right, the first point is labeled E for earthquake. Especially in the West, the central Mississippi valley, the coastal area of South Carolina, and southern Alaska and Hawaii (Figure 3.3), the potential for disruption of major power system equipment by earthquake is significant. Severe damage to distribution poles, transmission towers, and substations can result. Generators may be damaged or subjected to enough stress that they have to be taken off-line. For example, the North Anna Nuclear Power Station was taken off-line following a magnitude 5.8 earthquake in Virginia in 2011 and remained off-line for more than 10 weeks as the owner and operator conducted thorough damage assessments and the Nuclear Regulatory Commission granted approval for restart (Vastag, 2011; Peltier, 2012). In addition, there is substantial risk of the loss of fuel, particularly from natural gas systems, given the long supply chain and vulnerability of pipelines to earthquakes. While earthquakes typically come without warning, the propagation velocity of earthquake waves is much slower than the speed of light, so that in some cases it is possible with appropriate instrumentation to obtain several seconds of advance warning (hence the horizontal line that runs to the right of point E in Figure 3.1). When possible, such warning could give time to de-energize critical components so as to minimize damage. Research is continuing on a wide range of grid-specific technologies. Organizations like the Pacific Earthquake Engineering Center are working on technologies such as more durable ceramic and non-ceramic insulators, flexible electrical connectors, and advanced materials for towers and attachments. Restoration following a major earthquake is a massive problem requiring a wide range of difficult engineering and construction projects in a compromised environment, with competition from other restoration priorities. For example, key bridges or roads required to access damaged facilities may be impassable. If an earthquake destroys key generating, substation, or transmission equipment, it may take weeks or months to restore service. Physical Attack A physical attack, denoted by point P, could occur without warning or with only limited warning. Physical attacks on major system components could cause serious physical damage, especially to large transformers and other hard to replace substation and transmission equipment such as high-voltage circuit breakers. The possibility of such attacks has been a concern for many years (OTA, 1990; NRC, 2012; DOE, 2015; Parfomak, 2014). Globally, transmission and distribution systems have been a focus of physical attacks, bombings, and terrorist activity—for example, in Afghanistan, Colombia, Iraq, Peru, and Thailand (NRC, 2012). In the United States, there have been relatively few well-planned attacks on the electricity system, though the 2013 sniper attack of the Metcalf transmission substation (Box 3.1) provides a reminder of the physical vulnerability of the system. Recovery could easily require many days or weeks. Generation facilities tend to have greater physical security and thus are less vulnerable to physical attack than substation and transmission facilities. Cyber Attack Like a physical attack, a cyber attack, denoted with a C, could also occur with limited or no warning. The best defense against cyber attacks is preventing intrusions to critical systems and detecting and expunging malware before it becomes activated. However, if that is not possible, the consequences of a successful cyber attack may be almost instantaneous, they could take a few seconds to some minutes to be fully realized, or an attacker may lay dormant for months collecting information as happened in the 2015 cyber attack on the Ukrainian power system (Box 3.2). It is difficult to determine how many cyber attacks have been attempted against U.S. utilities, by what means, and with what consequences. In the time between detection of an intrusion and manifestation of any consequences, it may be possible to take some steps to limit the potential disruptive impacts. In many cases a cyber attack may not give rise to major physical damage to the system, although in some circumstances physical damage can result, especially if the attackers are sophisticated. Depending on the nature of the attack, just how long it would take to restore is unclear. The unique issues associated with cyber risks and restoration are discussed in Chapters 4 and 6. There are also diverse types of cyber attacks and vulnerabilities within the electricity system. According to recent analysis done for the Quadrennial Energy Review (Argonne National Laboratory et al., 2016), the electricity system vulnerabilities include the following: Supervisory control and data acquisition systems that rely on modern communication infrastructure to collect data and send control signals in both the bulk power system (generation and transmission) and at the substation level; Large power plant distributed control systems that use local communications channels to perform local control on large power plants; Smart grid technologies, including software-based components with communication capabilities, used to increase the reliability, security, and efficiency of the grid as well as communicate data between utilities and customers; Distributed energy resources that are connected to open networks for communication and can include smart inverters with remote access; Supply chain that might have vulnerabilities of legacy software systems from commercial vendors; and Corporate communication networks that might have an entry point to electricity systems’ control networks. The modern power system also makes extensive use of the global positioning system (GPS), especially for time synchronization. Hence, disruption of GPS by space weather, or through cyber attack, could cause disruption in the bulk power system. Operations Error A number of historical blackouts have been caused by one or more faults, typically when the system is heavily loaded, that could have been managed if not for a sequence of subsequent operator errors. The network structure of the grid allows large-scale disruptions to result from distant, localized electrical faults, and system irregularities can propagate near instantaneously, generally through the work of protection relays acting unexpectedly to unusual system conditions. For example, the infamous 2003 Northeast blackout was triggered by a simple fault—a tree caused a transmission line short circuit—but within hours it became the largest blackout in U.S. history, owing to two computer/software errors that caused a lack of situational awareness from grid operators. A smaller but similar cascading failure BOX 3.1 Summary of the Metcalf Substation Attack In April 2013, the Pacific Gas and Electric-owned Metcalf Transmission Substation outside of San Jose, California, was attacked by one or more gunmen. The attack was well planned and executed, with the attacker(s) severing several fiber-optic cables to disrupt local communications prior to beginning the attack with military-style rifles. In the hour between when communications lines were cut and the first law enforcement officers arrived, 17 transformers had been seriously damaged as oil leaked from bullet holes allowing electric components to overheat. No major outages occurred, as operators were able to re-route power flows from nearby generators, but the attack caused more than $15 million in damages. Of course, compared with the havoc that would result from a coordinated attack on multiple key substations, the Metcalf event was rather minor. BOX 3.2 Summary of the Cyber Attack on the Ukrainian Grid In a recent, well-publicized cyber attack, approximately 225,000 people were left without power for approximately 6 hours on December 23, 2015, in Ukraine. The attackers gained access to internal networks of three utilities through spear-phishinga schemes, malware, and manipulation of long-known Microsoft Office macro vulnerabilities. Rather than try to engineer breaches through the firewall, the attackers patiently harvested the credentials needed to gain access to the supervisory control and data acquisition (SCADA) system and learned how to operate the SCADA software. The attackers executed a well thought out strategy, including the following: Creating virtual workstations inside SCADA systems that were trusted to issue system commands; Co-opting remote terminal units within SCADA systems to issue “open” commands to specific breakers at substations; Severing communications by targeting firmware in serial-to-Ethernet devices, making most unrecoverable; Installing and running a modified KillDisk program that deleted information on what was occurring while making recovery reboots nearly impossible; Shutting down uninterruptible power supplies at control centers; and Executing a large denial-of-service attack on utility call centers that prevented customers from reporting outages and reduced the utilities’ understanding of the extent of outages. These actions prevented operators from accessing the SCADA systems, left control centers without power, and left cyber monitoring and control systems inoperable. Service was restored by shutting off the SCADA system and resorting to manual operation. Although power was restored relatively quickly, control centers were not fully operational for months following the attack (E-ISAC and SANS ICS, 2016). a Spear phishing is a targeted email that appears to be from a known business or individual but is not. It is designed to gain unauthorized access to internal systems by prompting the target to download unwanted software. occurred in 2011 in the southwestern United States, when a problem at a single substation in Arizona grew into a major outage across Southern California in a few minutes. There are a vast number of potential types of operations error—in both control rooms and in the field—that can lead to cascading blackouts, which makes planning difficult. Fortunately, because virtually all key components of the power system have protective devices that disconnect before damage can occur, cascading blackouts typically do not cause serious physical damage to system components beyond the initiating failure. Depending on system conditions and the nature of faults, operator error can unfold over periods of minutes to hours, and there may be opportunities to detect errors and take corrective action. With improved training and drilling, better instrumentation, improved situational awareness, and improved control methods, the risks of operator error leading to cascading failure have been, and can continue to be, reduced. At the same time, other external threats such as terrorist attacks and pandemics can place operators under stress and potentially increase the probability of errors. In Figure 3.1, operations errors are denoted by point O. Tsunamis The domain of damage for tsunamis, denoted T in Figure 3.1, is limited to coastal regions. Figure 3.4 shows locations in the United States that have experienced major tsunami events over the past millennium, which are almost entirely on the Pacific coast. A large international warning system, involving 26 nations, monitors and provides warning across the Pacific basin. As part of that system, the United States hosts the Pacific Tsunami Warning Center near Honolulu, Hawaii, and also operates the Alaska Tsunami Warning Center in Palmer, Alaska. With advance warning, critical facilities can be shut down to reduce damage. Although the best way to reduce the risks to the power system is to place major facilities in locations that are not vulnerable to tsunamis, abandoning and moving existing installations is expensive, and there may be other protective steps that can be taken such as elevating backup generators. This is increasingly a factor in utility planning in Hawaii and along the West Coast. Regional Weather Weather events can be a major cause of disruption for the power system. Scientific knowledge about both the causes of severe weather events and the ability to detect changes in the risks varies considerably. Some changing risks, such as the likelihood of more frequent and extreme precipitation events and more frequent heat waves, are reasonably well understood in both regards. Others, like the frequency andintensity of ice storms (which can devastate power systems), are not understood in either regard. Figure 3.5 displays this considerable variation in the level of scientific understanding of weather and how the frequency and intensity of different weather events may evolve as a consequence of natural variability, climate system oscillations (El Niño–Southern Oscillation, North Atlantic Oscillation, etc.), and secular climate changes (IPCC, 2013; NASEM, 2016). In Figure 3.1, point R denotes regional weather events such as intense convective storms and tornadoes that are capable of widespread damage, especially to distribution systems. Generally, individual tornadoes impact only a small area, and the specific locations at which damages occur are often difficult to anticipate. However, increasing resolution in weather forecasts does provide system operators with some ability to prepare and be ready to respond quickly once damage has occurred—for example, by pre-positioning repair crews. Tornadoes have occurred in all parts of the country, but they are rare west of the Rocky Mountains. Similarly, tornadoes do not occur at a uniform rate across the year and are most frequent in April, May, and June (Figure 3.6). Utilities and communities in high-frequency areas are aware of the risk and routinely prepare, building shelters for people and hardening the utility infrastructure. The frequency of tornadoes shows a strong temporal and seasonal variation (Figure 3.7). The annual frequency of tornadoes strong enough to cause damage to power lines shows no apparent time trend. On the other hand, Tippett et al. (2016) report that “the largest U.S. effects of tornadoes results from tornado outbreaks . . . we find that the frequency of U.S. outbreaks with the many tornadoes is increasing and that it is increasing faster for more extreme outbreaks.” Tippett et al. (2016) report that, to date, they have been unable to link this increase to climate change. While not ruling out climate change, they speculate that low-frequency climate variability may be a contributing factor, among others. Figure 3.8 shows a track of storms on April 21 and 22, 2006, impacting four states from Mississippi to North Carolina. Often these different events are not connected by local authorities, each of which is responsible for recovery from a fraction of the total impact. Ice Storms Point I in Figure 3.1 denotes ice storms (freezing rain). As is evident from the experience in 1998 in Québec, Ontario, and in upstate New York, ice storms (freezing rain) can result in very widespread damage after which full recovery may take many weeks. Figure 3.9A shows the historical distribution of freezing rain events in the United States over the past 50 years. Figure 3.9B shows the slight upward trend in event frequency over the period 1975 to 2014. Figure 3.9C shows the likely trend in the frequency of future ice storms across the different regions at risk. Ice storms interrupt power through the accumulation of ice on distribution and transmission lines, as the added weight brings lines down and causes damage to poles and towers. In addition to increased weight, wind blowing against ice-laden transmission lines can cause low-frequency (1 Hz) high-amplitude (1 m) oscillations (called conductor gallop) that further stress towers and insulators. Ice accumulation on nearby trees can cause branches to fall on lines or bring vegetation close enough to allow arcing current to cause a short. Impacts to distribution systems are common, whereas damage to transmission towers is less common but requires more resources and time to recover from. Many evocative pictures of damaged transmission and distribution infrastructure are available, dating back nearly 100 years. Figure 3.10A illustrates the extent to which ice can accumulate on distribution systems, and Figure 3.10B shows towers that collapsed due to ice accumulation during a massive storm in Québec in 1998. After the first tower failed, others were pulled down. Winter storms are a leading cause of power outages nationally but do not receive as much national attention as concentrated events like hurricanes. However, they often do not meet Department of Energy (DOE) reporting requirements and might be exempt from the system average interruption duration index and the system average interruption frequency index reliability metric reporting. Because winter storm outages may be underreported, accurate statistics are not available. The majority of outages are relatively localized and handled by utility crews experienced with recovering from them. There are established and emerging techniques to reduce the risk of damage from ice storms and accelerate restoration. Building towers to higher standards is a known strategy, but there is insufficient data on the likelihood of extreme ice events and the associated costs of outages to support greater investment. Techniques being explored for distribution systems include helically staked guying for poles, hydrophilic coating to help electrical infrastructure shed ice, and disconnecting wires that fall to the ground without damaging poles. Floods Floods (Point F in Figure 3.1) can take many forms, from very abrupt flash floods that follow a sudden rainstorm or the breach of a dam, to events whose buildup occurs over extended periods. Floods can damage distribution or transmission towers and their footings or damage equipment installed on the ground. Most utilities have used historical flood data to choose locations for major facilities, such as substations, that are unlikely to be inundated. However, as the climate changes, the frequency of inundation is also changing (e.g., in some places a “100-year event” may have a much more frequent return period). Hurricanes and tropical storms are a principal cause of flooding. Detailed maps of the “100-year flood plan” are available for much of the United States from the Federal Emergency Management Agency (FEMA). As of 2005, about one million miles of stream have been mapped. Figure 3.11 shows an example map for an area impacted by the flood following Hurricane Agnes. The map reproduced here is compressed (and hence the legends are not readable), but it is included here to convey the type of information that is available. The Intergovernmental Panel on Climate Change (IPCC) fifth assessment report anticipates that, in light of climate change, North America will experience “an increase in the number of heavy precipitation events” and “increased damages from river and coastal urban floods” (IPCC, 2014). These changes suggest that it is time to explore the development of more informative strategies to communicate the likely extent and frequency of future flooding since the traditional 30-year or 100-year flood metric is problematic when the underlying physical processes are not stationary. The National Research Council Committee on Floodplain Mapping Technologies examined map accuracy in 2007 in a report titled Elevation Data for Floodplain Mapping and recommended much greater use of lidar altimetry (NRC, 2007). There are several challenges to accurate flood mapping, including these two: (1) the changes in the rate of river flows (and height of crest) as land is developed in a watershed, and (2) popular pressure to understate risk to lower flood insurance costs and avert an adverse impact on real estate value. Despite these limitations, the FEMA flood maps, if interpreted conservatively, provide a superb basis for assessing flood risks to electrical assets and planning flood remediation. In addition to disrupting the bulk power system, flooding can make access difficult for distribution system repair crews, cause damage by flooding manholes, and cause other problems in underground distribution systems and components. This suggests that care should be taken in design and building of underground systems in flood-prone areas. Space Weather and Other Electromagnetic Threats A variety of solar activities (referred to as space weather, point S in Figure 3.1) can impact the earth’s environment (NRC, 2008). Large bursts of charged particles ejected by storms on the sun, called coronal mass ejections, can intersect the earth, causing fluctuations in earth’s magnetic field that create very low frequency voltage gradients across land, generally at northerly latitudes, and induce quasi-steady-state current that can flow in long transmission lines. These low-frequency currents can cause saturation of transformer magnetic cores and result in damage from overheating. Transformer saturation can also result in reactive power and harmonic generation, which can impact the entire power system. The largest storm of this type in the historical record is the 1859 Carrington Event, which caused telegraph systems in the United States and Europe to fail. More recently, smaller solar storms have caused blackouts and very limited damage in power systems. In March 1989, approximately 6 million people lost power for up to 9 hours across Québec from a solar storm that damaged a few transformers and other equipment. A smaller hour-long outage occurred in Sweden in October 2003.

### 1NC – Accidification

#### No acidification impact – key studies they cite have major flaws, and species adaptation and ocean buffering prevent their impacts

**Delingpole, 2016** (James, citing Patrick Moore, co-founder of Greenpeace and Howard Broman, marine scientist with 35 years of experience, “Ocean acidification: yet another wobbly pillar of climate alarmism”, The Spectator, 4/30/2016, http://www.spectator.co.uk/2016/04/ocean-acidification-yet-another-wobbly-pillar-of-climate-alarmism/)//JBS

No indeed. Ocean acidification is the terrifying threat whereby all that man-made CO2 we’ve been pumping into the atmosphere may react with the sea to form a sort of giant acid bath. First it will kill off all the calcified marine life, such as shellfish, corals and plankton. Then it will destroy all the species that depend on it — causing an almighty mass extinction which will wipe out the fishing industry and turn our oceans into a barren zone of death. Or so runs the scaremongering theory. The reality may be rather more prosaic. Ocean acidification — the evidence increasingly suggests — is a trivial, misleadingly named, and not remotely worrying phenomenon which has been hyped up beyond all measure for political, ideological and financial reasons. Some of us have suspected this for some time. According to Patrick Moore, a co-founder of Greenpeace, long one of ocean acidification theory’s fiercest critics, the term is ‘just short of propaganda’. The pH of the world’s oceans ranges between 7.5 and 8.3 — well above the acid zone (which starts below ‘neutral’ pH7) — so more correctly it should be stated that the seas are becoming slightly less alkaline. ‘Acid’ was chosen, Moore believes, because it has ‘strong negative connotations for most people’. Matt Ridley, too, has been scathing on the topic. In The Rational Optimist he wrote, ‘Ocean acidification looks suspiciously like a back-up plan by the environmental pressure groups in case the climate fails to warm.’ I agree. That’s why I like to call it the alarmists’ Siegfried Line — their last redoubt should it prove, as looks increasingly to be the case, that the man-made global warming theory is a busted flush. To the alarmist camp, of course, this is yet further evidence that ‘deniers’ are heartless, anti-scientific conspiracy theorists who don’t read peer-reviewed papers and couldn’t give a toss if the world’s marine life is dissolved in a pool of acid due to man’s selfishness and greed. Unfortunately for the doom-mongers, we sceptics have just received some heavy fire-support from a neutral authority. Howard Browman, a marine scientist for 35 years, has published a review in the ICES Journal of Marine Science of all the papers published on the subject. His verdict could hardly be more damning. The methodology used by the studies was often flawed; contrary studies suggesting that ocean acidification wasn’t a threat had sometimes had difficulty finding a publisher. There was, he said, an ‘inherent bias’ in scientific journals which predisposed them to publish ‘doom and gloom stories’. Ocean acidification theory appears to have been fatally flawed almost from the start. In 2004, two NOAA scientists, Richard Feely and Christopher Sabine, produced a chart showing a strong correlation between rising atmospheric CO2 levels and falling oceanic pH levels. But then, just over a year ago, Mike Wallace, a hydrologist with 30 years’ experience, noticed while researching his PhD that they had omitted some key information. Their chart only started in 1988 but, as Wallace knew, there were records dating back to at least 100 years before. So why had they ignored the real-world evidence in favour of computer-modelled projections? When Wallace plotted a chart of his own, incorporating all the available data, covering the period from 1910 to the present, his results were surprising: there has been no reduction in oceanic pH levels in the last -century. Even if the oceans were ‘acidifying’, though, it wouldn’t be a disaster for a number of reasons — as recently outlined in a paper by Patrick Moore for the Frontier Centre for Public Policy. First, marine species that calcify have survived through millions of years when CO2 was at much higher levels; second, they are more than capable of adapting

### 1NC – Miscalc

#### No miscalc from satellite disruptions, but terrestrial conflict turns it

Mazur 12 (Jonathan Mazur, Manager Engineering at Northrop Grumman, writing in Space & Defense, from the Eisenhower Center for Space and Defense Studies. Past U.S. Actions: Redlines in Space. Space & Defense, Volume 6, Number 1, Fall 2012. https://inss.ndu.edu/Portals/97/Space\_and\_Defense\_6\_1.pdf?ver=2018-09-06-135424-147)

U.S. Reactions To Foreign Disruption Of U.S. Capabilities

In the 1970s, it was suspected that a U.S. maritime communications satellite was turned off by the Soviets when it was outside of the range of U.S. tracking stations.25 There does not appear to be any documented U.S. reaction, and I suspect there was none. In the mid-1990s, satellite hackers in Brazil began hijacking U.S. military communication satellite signals to broadcast their own information, though it took until 2009 for Brazil to crack down on the illegal activity with the support of the DoD.26 In 1998, a U.S.-German satellite known as ROSAT was rendered useless after it turned suddenly toward the sun. NASA investigators later determined the accident was possibly linked to a cyber-intrusion by Russia.

The fallout? Though there was an ongoing criminal investigation as of 2008; NASA security officials have seemed determined to publicly minimize the seriousness of the threat.27 In 2003, a signal originating from Cuba—later determined to be coming from Iranian embassy property— was jamming a U.S. communications satellite that was transmitting Voice of America programming over Iran, which was publicly referred to as an “act of war” by a U.S. official. 28 Press reporting indicates the U.S. administration was [frozen]“paralyzed” about how to cope with the jamming that continued for at least a month, even after U.S. diplomatic protests to Cuba.29 In 2005, U.S. diplomats protested to the Libyan government after two international satellites were illegally jammed disrupting American diplomatic, military, and FBI communications.30 In 2006, press reporting indicates that China hit a U.S. spy satellite with a ground-based laser. This action was acknowledged by the then director of the NRO, though the DoD remained tight lipped about the incident.31

“We’re at a point where the technology’s out there, and the capability for people to do things to our satellites is there. I’m focused on it beyond any single event.” – Air Force Space Command Commander, General Chilton, 2006 32

In 2009, a U.S. commercial Iridium communications satellite—extensively used by the DoD—was accidently destroyed by a collision with a dead Russian satellite.33 The U.S. company, Iridium, was able to minimize any loss of service by implementing a network solution within a few days.34 As of early 2011, no legal action had been taken by the company either because it is not clear who was at fault or because it might be politically problematic for the United States, which is trying to enter into bi-lateral transparency and confidence-building measures (TCBM) with Russia regarding space activities.35 Since August of 2010, North Korea has been intermittently using GPS jamming equipment, which reportedly has been interfering with U.S. and South Korean military operations and civilian use south of the North Korean border.36 Reportedly, only South Korea and the United Nations International Telecommunications Union—at the request of South Korea—have issued letters to Pyongyang demanding the cessation of disruptive communications signals in South Korea.37

It appears that the only time the U.S. military has responded with force to a disruption in U.S. space capabilities was in 2003, a few days after the start of the Iraq war.38 According to U.S. officials, Iraq was using multiple GPS jammers—which supposedly did not affect military GPS functionality. However, the U.S. military bombed the jammers anyway after a diplomatic complaint to Russia.39 The use of military force against the GPS jamming threat was possibly because the United States was already intervening in Iraq, and the bombing probably would not have occurred if the United States was not at war.

#### No war.

Bowen 18 [Bleddyn, Lecturer in International Relations at the University of Leicester; ELN; 20 Februrary 2018; “The Art of Space Deterrence,” <https://www.europeanleadershipnetwork.org/commentary/the-art-of-space-deterrence/>] brett

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

### 1NC – Drones

#### Loss of satellites shuts down drones

Daniel Ventre 11, Engineer for CNRS and Researcher for CESDIP, Cyberwar and Information Warfare, p. 198-199

The introduction of cyberspace operations is part of a specific context; a major evolution in the operation environment and the nature of the conflicts, which make irregular wars the rule, and make regular actors the exception to the rule. But the battle against unconventional, non-state governed, irregular actors raises specific problems: there are multiple actors, unpredictable at that, who do not abide by the same rules. New orders in conflicts are imposing the implementation of an ever more important need for information, and information collection and processing. Networks now have an incredible importance. The document refers to the growing threats against American heritage: the USA is a target and the increasing amount of attacks against their networks is indeed the proof of this. There are many obstacles which need to be removed before they can achieve real superiority and freedom to act, especially as vulnerable points may originate within the very operations of the armed forces. An example of this is the vulnerability of using products (software and hardware), commercial products (off-the-shelf), and sometimes even foreign products123. This brings to mind the fact that the US Air Force uses commercial, even foreign, applications for its cyberspace operations.

Information space extends to space124, particularly via communication and observation satellites125. Satellites are the keystone to the cyberspace and communication systems, but also the security system: monitoring (Echelon network is the symbol), observation, communication. These are at the heart of the C4ISR systems, without which a concept such as network-centric warfare could not exist. There would be no drones without satellites. It is even a question of extending the Internet to extra-atmospheric space. Projects in this vein (Interplanetary Networks) were being formed in the 1990s, but ran into several technical difficulties (delays in important transmissions due to high distances and costs) [GEL 06]. NASA dedicates a few pages on its website to this project126. The development of communication systems based on the infrastructures in extra-atmospheric space will also raise questions for legal, geopolitical and geostrategic domains: questions of seizing this space, questions of regulation of human activity in this space, of sovereignty, new territoriality and independence.

#### Drone prolif is inevitable and causes global nuclear war

Dr. Michael C. Horowitz 19, Professor of Political Science at University of Pennsylvania, NDT Champion from Emory University, PhD in Government from Harvard University, Adjunct Senior Fellow at the Center for a New American Security, “When Speed Kills: Autonomous Weapon Systems, Deterrence, and Stability”, 5/2/2019, https://papers.ssrn.com/sol3/papers.cfm?abstract\_id=3348356

Thus, the reason to deploy autonomous systems would have to be their reliability and effectiveness rather than signaling. And giving up human control to algorithms in a crisis that could end with global nuclear war would require an extremely high level of perceived reliability and effectiveness. Few things are more important to militaries in crisis situations than informational awareness and control over decisions, and there might be fear that autonomous systems are prone to accidents.

This counterfactual illustrates that the development and deployment of lethal autonomous weapon systems by national militaries, if it occurs, is unlikely to have simple, easy, and linear consequences. Instead, human factors, including the psychological desire for control and organizational politics, will strongly shape how militaries think about developing and using LAWS. This will not just influence the potential for arms races in peacetime, but deterrence and wartime stability due to the organizational processes militaries implement for the deployment and use of autonomous systems on the battlefield.

This paper draws on research in strategic studies and examples from military history to assess how LAWS could influence the development and deployment of military systems, including arms races, crisis stability, and wartime stability, especially the risk of escalation. It also discusses the potential for arms control. It focuses on these questions through the lens of key characteristics of LAWS, especially the potential for increased operational speed and, simultaneously, less human control over battlefield choices. One of the primary attractions of autonomous systems, even compared to remotely piloted systems, is the potential to operate at machine speed. Another potential benefit is the possibility of machine-like accuracy in following programming, but that comes with a potential downside: the loss of control and the accompanying risk of accidents, adversarial spoofing, and miscalculation. Even if LAWS malfunction at the same rate as humans in a given scenario, the ability of operators to control the impact of those malfunctions may be lower, which could make LAWS less predictable on the battlefield. The paper then examines how these issues interact with the large uncertainty parameter associated with AI-based military capabilities at present, both in terms of the range of the possible and the opacity of their programming.

The results highlight several critical issues surrounding the development and deployment of LAWS.1 First, the desire to fight at machine speed with autonomous systems, while making a military more effective in a conflict, could increase crisis instability. As countries fear losing conflicts faster, it will generate escalation pressure, including an increased incentive for first strikes. Second, in addition to the actual risk of accidents and miscalculation from LAWS, the fear of accidents and losing control of autonomous systems could limit the willingness of militaries to deploy them, particularly since many militaries are conservative when it comes to emerging technologies and have high standards for system reliability. Third, the dual-use, or even general purpose, character of the basic science underlying many autonomous systems will make the technology hard to control, giving many countries and actors access to basic algorithms, though whether this is described as diffusion, proliferation, or an arms race will depend on political dynamics as much as anything.

Finally, multiple uncertainty parameters concerning lethal autonomous weapon systems could exacerbate security dilemmas. Uncertainty over the range of the possible concerning the programming of lethal autonomous weapon systems will increase fear of those systems in the near term, making restraint less likely for competitive reasons. Moreover, the inherent differences between remotely piloted systems and LAWS at the platform level come from software, not hardware. There is arguably an inherent opacity to lethal autonomous weapon systems. If an arms race over lethal autonomous weapon systems occurs, it will likely be because of worse-case assumptions about capability development by potential adversaries.

What is Autonomy or Artificial Intelligence?

Artificial intelligence is the use of computing power, in the form of algorithms, to conduct tasks that previously required human intelligence.2 Artificial intelligence in this context is best thought of as an umbrella technology or enabler, like the combustion engine or electricity. Military applications of artificial intelligence are potentially broad – from image recognition for surveillance to more efficient logistics to battle management.3 These include both non-kinetic applications, including in the cyber realm, as well as kinetic applications.4 One potential application of artificial intelligence is through armed autonomous systems that could be deployed on the battlefield, or what are most popularly called lethal autonomous weapon systems or lethal autonomous weapon systems. This differs from remotely-piloted systems where a human, though at a distance, still operates a given vehicle or system.

What is a lethal autonomous weapon system? While simple to describe on first glance, and easy to understand in the extreme – an armed humanoid robot with extremely broad programming making decisions about engaging in warfare – drawing the line between a lethal autonomous weapon system and other weapon systems is complex. In Directive 3000.09, published in 2012, the US Department of Defense defines an autonomous weapon as “A weapon system that, once activated, can select and engage targets without further intervention by a human operator.”5 What it means to select and engage a target is not entirely clear, however. For example, homing munitions, which have existed since World War II, select and engage targets, according to a common sense understanding of the terms.6

Exactly what functions are autonomous also matters. A system could have automatic piloting, for example, that flies or drives a platform to a target, but still have complete human control over the use of the weapon. That would be a system with a high level of automation, though not a lethal autonomous weapon system according to most perspectives. Heather Roff measures the level of autonomy in a weapon system based on three subcomponents: self-mobility, self-direction, and self-determination. This helps distinguish systems where there might be autonomy concerning the best way a missile should get to a target, but the target itself is designated by a person fromsystems where an algorithm might be making higher-level engagement decisions.7 There are already some applications of limited machine autonomy in military systems, with the most prominent example being the automatic mode present on many Close-In Weapon Systems (CIWS), such as the Phalanx, used to defend ships and incoming missiles from attack.8

This article will not resolve the definitional debate surrounding lethal autonomous weapon systems, which is still ongoing in meetings of the Group of Governmental Experts focused on lethal autonomous weapon systems in the United Nations Convention on Certain Conventional Weapons. Provisionally, this article adopts the Scharre and Horowitz definition that a lethal autonomous weapon system is “[A] weapon system that, once activated, is intended to select and engage targets where a human has not decided those specific targets are to be engaged.”9 However, moving beyond the close cases (e.g. particular types of missile guidance systems) and considering those weapon systems that clearly use machine intelligence to search for, select, and/or engage targets can help clarify what is at stake in this debate in the first place.10 After all, if most militaries most of the time would not have any need for lethal autonomous weapon systems, or those systems have significant disadvantages relative to remotely-piloted military robotics or soldiers on the battlefield, the stakes are lower. In contrast, if the integration of machine intelligence with military systems could give countries or violent non-state actors a significant advantage in how they employ force, it becomes even more crucial to engage the topic.

It is important to note that this article does not address concerns about existential risk related to artificial general intelligence – the fear that a superintelligence could decide to destroy the human race, either because it decides humans are malign or because humans program it to achieve a goal it can only accomplish by destroying humans.11 The existential risk issue associated with artificial intelligence is not necessarily closely coupled to military applications of artificial intelligence. If a super-intelligent machine learning system has the ability to take over human society in the interest of a goal – any goal – whether autonomous systems at much smaller orders of magnitude already exist in military systems will likely be unimportant. The super-intelligent system would simply create what it needed.

Why Invest in Autonomous Systems?

Militaries are already increasing their investments in remotely-piloted robotic systems. From UAVs such as the MQ-9 Reaper (United States) to uninhabited surface vehicles (USVs) such as the Guardium (Israel) to uninhabited ground vehicles (UGV) such as Platform-M (Russia), militaries around the world are investing in remotely piloted platforms, some of which can carry weapons. In these systems, human control over the use of force is not fundamentally different from the use of force with inhabited systems. In some cases, such as the MQ-9 Reaper, the sensor system a drone pilot uses to launch a weapon might even be the same sensor system a pilot in the cockpit of an inhabited fighter uses. Using remotely piloted systems gives militaries the ability to reduce the risk to their own soldiers while still projecting power in similar ways to how they used force previously.12 The first places militaries are likely to use kinetic lethal autonomous weapon systems include relatively “clear” environments such as air-to-air combat or naval combat, especially in geographic arenas where civilians are extremely unlikely to be present.13