## 1NC

### 1NC---OFF

#### The ROB is to determine the truth of falsity of the resolution –

#### 1] Textuality – five dictionaries[[1]](#footnote-1) define to negate as to deny the truth of and affirm[[2]](#footnote-2) as to prove true.

#### That OW –

#### a] Jurisdiction – judges are constrained through their constitutive purpose and proves it’s a side constraint on what arguments they can vote on.

#### b] Predictability – people base prep off the pregiven terms in the resolution.

#### 2] Isomorphism – alternative ROBs aren’t binary truth/false because of topic lit biases which increases intervention and takes the debate out of the hands of debaters.

#### 3] Inclusion – any offense functions under it as long as debaters implicate their positions to prove the truth or falsity of the resolution which maximizes substantive clash through ground and is a sequencing question for engaging in debate.

#### 4] Logic – any statement relies on a conception of truth to function – for example, I’m hungry is the same as its true that I’m hungry – logic is a litmus test for any argument and proves your ROB collapse since it relies on truth.

#### I negate –

#### 1] the[[3]](#footnote-3) is “denoting a disease or affliction” but appropriation isn’t a disease

#### 2] of[[4]](#footnote-4) is to “expressing an age” but the rez doesn’t delineate a length of time

#### 3] private[[5]](#footnote-5) describes “belonging to or for the use of one particular person or group of people only” and an entity[[6]](#footnote-6) is “independent, separate, or self-contained existence”

#### 4] In order to make a moral decision, you must know everything about a particular situation, and you must act immediately in the face on injustice, otherwise you allow injustice to occur. These are simultaneously impossible since a) we cannot know everything about a particular situation and b) there is not infinite time to make an ethical decision. Given that there must be deliberation over any moral decision to ensure its correctness in relation to the situation, the very act of deliberation is violence, as you allow the injustice to continue, but if you were to act immidiately you would act without proper knowledge to correctly address the injustice.

#### 5] a priori's 1st – even worlds framing requires ethics that begin from a priori principles like reason or pleasure so we control the internal link to functional debates since proving contradictions with the world mean that even under cw its still offense

#### P+P negate –

#### A] more often false than true since I can prove something false in infinite ways which outweighs on probability

#### B] real world policies require positive justification before being adopted which outweighs on empirics

#### C] ought means the aff has to prove an obligation if that definition is legitimate which means lack of that obligation negates. Even under comparing worlds these arguments negate since it requires them to prove the statement that “the aff world is more desirable than the neg world” true. However, my args deny their ability to prove statements true so you presume neg. Also, I don’t need to win presumption to win, I just need to win any of the arguments below because the aff is false, not just no offense and if I’m textual I’m fair because the topic is the most predictable, so you could’ve engaged.

### 1NC---OFF

#### Interp: The affirmative must define “outer space” in a delimited text in the 1AC.

#### “Outer Space” is flexible and has too many interps – normal means shows no consensus and makes the round irresolvable since the judge doesn’t know how to compare between types of offense and o/w since it’s a side constraint on decision making – independently turns judicial application.

Leepuengtham 17 [Tosaporn Leepuengtham (Research Judge, Intellectual Property and International Trade Division, Supreme Court of Thailand). "International space law and its implications for outer space activities." 01-27-2017, Accessed 12-9-2021. https://www.elgaronline.com/view/9781785369612/06\_chapter1.xhtml // duongie

Those states which favor the precise demarcation of outer space support the spatial approach, whereas those who oppose to such demarcation prefer the functional approach, as the latter allows more flexibility in terms of the development of space technology.34 This lack of a definition and delimitation of outer space is problematic, since certain particular areas are neither explicitly defined as ‘air space’ or ‘outer space’. For example, it is vague whether an area located between 80 km and 120 km above sea level would be classified as either air space or outer space in the absence of demarcation, since 80 km is the maximum attitude for convention aircraft, and 120 km is the lowest attitude in which space activities could be carried out.35 Satellites which are stationed in a geostationary orbit are a good example of this ambiguity. Owing to this lack of any internationally recognized delimitation, equatorial states claim sovereignty over that part of the geostationary orbit which is located over their respective territories;36 whereas technologically developed countries believe that the geostationary orbit is an integral part of outer space.37 This uncertain status of areas leads to legal jurisdictional problems. According to international law, a state has sovereignty over the airspace above its territory.38 However, national sovereignty does not extend into outer space.39 Thus, it is necessary to determine where a state’s airspace ends to ensure that the appropriate legal regime is applied. One possible scenario which might occur and which is relevant to the subject of this book is the creation or infringement of an intellectual work is in just such an ambiguous location. This would cast doubt on the ‘legal’ location of creation or infringement, and the question of which applicable legal regime arises. Should we apply the law of the underlying state or is there no law to apply? For example, would satellite signals transmitted from a satellite stationed in a geostationary orbit located over equatorial countries be considered as works created or, if intercepted, be infringed, in outer space or in the sovereign air space of those respective countries? These hypothetical examples highlight why a boundary is necessary if unpredictability arising from different legal application is to be avoided. While it might be argued that this issue is being overemphasized at this stage, given increasing use of space technology, this problem is worth considering now rather than later.

appropriation[[7]](#footnote-7) is “a sum of money or total of assets devoted to a special purpose” but the rez doesn’t spec a purpose

#### Violation – you don’t.

#### Prefer –

#### 1] Stable Advocacy – they can redefine in the 1AR to wriggle out of DA’s which kills high-quality engagement and becomes two ships passing in the night – triggers presumption since the aff wasn’t subject to well researched scrutiny. We lose access to Tech Race DA’s, Asteroid DA’s, basic case turns, and core process counter plans that have different definitions and 1NC pre-round prep. That also means that cx doesn’t check since our preround prep is skewed plus judges don’t flow cx so its non verifiable

#### 2] Real World – Policy makers will always define the entity that they are recognizing. It also means zero solvency, absent spec, private entities can circumvent since there is no delineated way to enforce the aff and means their solvency can’t actualize.

#### OSspec isn’t regressive or arbitrary – its core topic lit for what happens when the aff is implemented and cannot be discounted from policies that require enforcement to function.

#### Fairness is a voter cause every arg assumes its being evaluated fairly and education is the only reasons school fund debate

#### Drop the debater to deter future abuse and set good norms

#### Competing Interpretations – a] Race to the bottom of the worst possible theory norms – B] Reasonability bad cause it invites arbitrary judge intervention

#### No Rvis

#### A - Forcing the 1NC to go all in on the shell kills substance education and neg strat which outweighs on timeframe, B - discourages checking real abuse which outweighs on norm-setting and constituvisim C - Encourages baiting – outweighs because if the shell is frivolous, they can beat it quickly D – its illogical for you to win for proving you were fair – outweighs since logic is a litmus test for other arguments

#### 1NC theory first - 1] Abuse was self-inflicted- They started the chain of abuse and forced me down this strategy 2] Norming- We have more speeches to norm over whether it’s a good idea since the shell was read earlier.

## Case

### 1NC---AT: Ozone

#### Ozone Layer is increasing – flips U/Q.

Horton 21 Helena Horton 9-15-2021 "‘Larger than usual’: this year’s ozone layer hole bigger than Antarctica" <https://www.theguardian.com/environment/2021/sep/16/larger-than-usual-ozone-layer-hole-bigger-than-antarctica> (Environmental Journalist for the Guardian)//Elmer

The hole in the ozone layer that develops annually is “rather larger than usual” and is currently bigger than Antartica, say the scientists responsible for monitoring it. Researchers from the Copernicus Atmosphere Monitoring Service say that this year’s hole is growing quickly and is larger than 75% of ozone holes at this stage in the season since 1979. Ozone exists about seven to 25 miles (11-40km) above the Earth’s surface, in the stratosphere, and acts like a sunscreen for the planet, shielding it from ultraviolet radiation. Every year, a hole forms during the late winter of thesouthern hemisphere as the sun causes ozone-depleting reactions, which involve chemically active forms of chlorine and bromine derived from human-made compounds. In a statement Copernicus said that this year’s hole “has evolved into a rather larger than usual one”. Vincent-Henri Peuch, the service’s director, told the Guardian: “We cannot really say at this stage how the ozone hole will evolve. However, the hole of this year is remarkably similar to the one of 2020, which was among the deepest and the longest-lasting – it closed around Christmas – in our records since 1979.

#### Two Thumpers to Ozone:

#### 1] Space Tourism

Marais 21 Eloise Marais 7-19-2021 "Space tourism: rockets emit 100 times more CO₂ per passenger than flights – imagine a whole industry" <https://theconversation.com/space-tourism-rockets-emit-100-times-more-co-per-passenger-than-flights-imagine-a-whole-industry-164601> (Associate Professor in Physical Geography, UCL)//Elmer

The commercial race to get tourists to space is heating up between Virgin Group founder Sir Richard Branson and former Amazon CEO Jeff Bezos. On Sunday 11 July, Branson ascended 80 km to reach the edge of space in his piloted Virgin Galactic VSS Unity spaceplane. Bezos’ autonomous Blue Origin rocket is due to launch on July 20, coinciding with the anniversary of the Apollo 11 Moon landing. Though Bezos loses to Branson in time, he is set to reach higher altitudes (about 120 km). The launch will demonstrate his offering to very wealthy tourists: the opportunity to truly reach outer space. Both tour packages will provide passengers with a brief ten-minute frolic in zero gravity and glimpses of Earth from space. Not to be outdone, Elon Musk’s SpaceX will provide four to five days of orbital travel with its Crew Dragon capsule later in 2021. What are the environmental consequences of a space tourism industry likely to be? Bezos boasts his Blue Origin rockets are greener than Branson’s VSS Unity. The Blue Engine 3 (BE-3) will launch Bezos, his brother and two guests into space using liquid hydrogen and liquid oxygen propellants. VSS Unity used a hybrid propellant comprised of a solid carbon-based fuel, hydroxyl-terminated polybutadiene (HTPB), and a liquid oxidant, nitrous oxide (laughing gas). The SpaceX Falcon series of reusable rockets will propel the Crew Dragon into orbit using liquid kerosene and liquid oxygen. Burning these propellants provides the energy needed to launch rockets into space while also generating greenhouse gases and air pollutants. Large quantities of water vapour are produced by burning the BE-3 propellant, while combustion of both the VSS Unity and Falcon fuels produces CO₂, soot and some water vapour. The nitrogen-based oxidant used by VSS Unity also generates nitrogen oxides, compounds that contribute to air pollution closer to Earth. Roughly two-thirds of the propellant exhaust is released into the stratosphere (12 km-50 km) and mesosphere (50 km-85 km), where it can persist for at least two to three years. The very high temperatures during launch and re-entry (when the protective heat shields of the returning crafts burn up) also convert stable nitrogen in the air into reactive nitrogen oxides. These gases and particles have many negative effects on the atmosphere. In the stratosphere, nitrogen oxides and chemicals formed from the breakdown of water vapour convert ozone into oxygen, depleting the ozone layer which guards life on Earth against harmful UV radiation. Water vapour also produces stratospheric clouds that provide a surface for this reaction to occur at a faster pace than it otherwise would. Space tourism and climate change Exhaust emissions of CO₂ and soot trap heat in the atmosphere, contributing to global warming. Cooling of the atmosphere can also occur, as clouds formed from the emitted water vapour reflect incoming sunlight back to space. A depleted ozone layer would also absorb less incoming sunlight, and so heat the stratosphere less. Figuring out the overall effect of rocket launches on the atmosphere will require detailed modelling, in order to account for these complex processes and the persistence of these pollutants in the upper atmosphere. Equally important is a clear understanding of how the space tourism industry will develop. Virgin Galactic anticipates it will offer 400 spaceflights each year to the privileged few who can afford them. Blue Origin and SpaceX have yet to announce their plans. But globally, rocket launches wouldn’t need to increase by much from the current 100 or so performed each year to induce harmful effects that are competitive with other sources, like ozone-depleting chlorofluorocarbons (CFCs), and CO₂ from aircraft. During launch, rockets can emit between four and ten times more nitrogen oxides than Drax, the largest thermal power plant in the UK, over the same period. CO₂ emissions for the four or so tourists on a space flight will be between 50 and 100 times more than the one to three tonnes per passenger on a long-haul flight. In order for international regulators to keep up with this nascent industry and control its pollution properly, scientists need a better understanding of the effect these billionaire astronauts will have on our planet’s atmosphere.

#### 2] Dichloromethane

Perkins 17 Sid Perkins 6-27-2017 "New threat to ozone layer found" <https://www.science.org/content/article/new-threat-ozone-layer-found> (Sid is a freelance science journalist based in Crossville, Tennessee. He specializes in earth sciences and paleontology but often tackles topics such as astronomy, planetary sciences, materials sciences, and engineering. Sid has a bachelor’s degree in natural science from Christian Brothers College in Memphis, Tennessee; bachelor’s and master’s degrees in aeronautical engineering from the Air Force Institute of Technology in Ohio; and a master’s degree in journalism from the University of Missouri in Columbia)//Elmer

The ozone layer—a high-altitude expanse of oxygen molecules that protects us from the sun's ultraviolet rays—has been on the mend for the past decade or so. But a newly discovered threat could delay its recovery. Industrial emissions of a chemical commonly used in solvents, paint removers, and the production of pharmaceuticals have doubled in the past few years, researchers have found, which could slow the healing of the ozone layer over Antarctica anywhere between 5 and 30 years—or even longer if levels continue to rise. The findings are "frightening" and "a big deal," says Robyn Schofield, an environmental scientist at the University of Melbourne in Australia who was not involved with the work. The chemical in question is called dichloromethane (CH2Cl2). Natural sources of this substance are small, says Ryan Hossaini, an atmospheric chemist at Lancaster University in the United Kingdom. Thus, he notes, the increase in emissions seen in recent years likely stems from human sources. Between 2000 and 2012, low-altitude concentrations of CH2Cl2 vapor rose, on average, about 8% per year, he adds. Globally, concentrations of CH2Cl2 approximately doubled between 2004 and 2014. Current CH2Cl2 emissions are about 1 million metric tons per year, Hossaini and his team estimate. Like chlorofluorocarbons (CFCs) and several other ozone-destroying chemicals you may have heard of, CH2Cl2 breaks apart when struck by sunlight. The chlorine atoms that are released then dismantle any ozone molecules they interact with. In 1987, an international agreement known as the Montreal Protocol led to a ban on the production and use of CFCs and many related compounds in industrial nations, but it ignored CH2Cl2 because researchers thought it didn't stay intact in the atmosphere long enough to rise into the stratosphere. Recent evidence now suggests, however, that the molecules can reach the lower edge of the stratosphere, which includes the ozone layer, despite its height 8 kilometers above the poles. To gauge the current and future threat to high-altitude ozone from CH2Cl2, Hossaini and his colleagues used computer simulations. In 2016, their analyses suggest, about 3% of the summer ozone loss in the Antarctic could be traced to CH2Cl2. That seems small, but in 2010 the substance was responsible for only 1.5% of the region's summer ozone loss, Hossaini says. If CH2Cl2 emissions continue to rise at the rate seen in the last decade, recovery of the ozone hole would be delayed about 30 years, the researchers estimate in Nature Communications. But if emissions of CH2Cl2 are held to current levels, healing of the ozone hole would be delayed only 5 years or so, the team finds. Simulations that don't include the effect of CH2Cl2 suggest that high-altitude ozone in the Antarctic will return to pre-1980 levels, the concentration measured before CFCs and other ozone-destroying chemicals were recognized as a problem, in 2065. The team's analyses "are quite important," says Björn-Martin Sinnhuber, an atmospheric scientist at Karlsruhe Institute of Technology in Germany. "It's clear that concentrations [of CH2Cl2] have increased quite a lot," he notes. But one critical question, he contends, is what will happen to emissions over the long term: "They've been quite variable in recent years, and it's difficult to say how they might evolve." Although the rapid rise in CH2Cl2 emissions may one day level off, it's also possible that emissions of this multipurpose chemical may accelerate even further. Hossaini and his team also assessed what would happen to high-altitude ozone if CH2Cl2 emissions rose at twice the rate seen in the past decade. The answer? Not good. Antarctic ozone wouldn't recover to pre-1980 levels until well after the year 2100, the analyses suggest. All this means that scientists now reviewing the Montreal Protocol should consider expanding the agreement to also regulate substances like CH2Cl2 that have atmospheric lifetimes of less than 6 months, Schofield says. Possibly as important, however, the team's results might also help other researchers identify which sources of CH2Cl2 are contributing most to the recent rise in emissions. That sort of information, Hossaini admits, is sadly lacking as of now.

#### No Ozone Impact.

Ridley 14 (Matthew White Ridley, BA and PhD in Zoology from Oxford. “THE OZONE HOLE WAS EXAGGERATED AS A PROBLEM,” *Rational Optimist*, 9/25/14, <http://www.rationaloptimist.com/blog/the-ozone-hole-was-exaggerated-as-a-problem.aspx>) dwc 19

Serial hyperbole does the environmental movement no favours My recent Times column 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 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 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 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.

#### Launches are emission free

NSS 21 7-23-2021 "Why Space Tourism?" <https://space.nss.org/why-space-tourism/> (National Space Society)//Elmer

Space Tourism Will Not Be a Pollution Disaster It is possible to accept all the benefits above, and still express concern about the potential that a really successful space tourism industry will pollute the air and contribute to global warming. Fortunately, Blue Origin’s New Shepard produces only water as an exhaust, so neither is going to be an issue even if there are 1,000s of flights per year. Some have claimed that space tourism will be more polluting per passenger mile since there are fewer passengers per vehicle at the current time, but (a) New Shepard has zero carbon/zero pollution, and (b) over time space tourism vehicles will grow in capacity, just like airliners did. The Virgin Galactic engine is more problematic, but will most likely be replaced by a more sustainable engine before flight volumes become large. Some might be more worried about SpaceX’s StarShip/SuperHeavy driving global warming when used for point-to-point travel on the Earth, and for space tourism. Elon Musk has declared his intention to produce the methane fuel it uses directly from the atmosphere using solar power, assuring that the fuel cycle is carbon-neutral. In terms of air pollution, StarShip in a point-to-point mode will to a large degree replace airplanes currently flying while using cleaner burning methane, potentially resulting in less pollution than is the case currently. In any case, trips to space will likely always remain a minor part of point-to-point travel on the Earth. Currently, in the U.S. alone, there are about 5,700 passenger flights PER DAY. Even if we are simultaneously supporting dozens of orbital hotels, building a city on Mars, and constructing a network of space solar power satellites, we will be hard pressed to generate more than a tiny fraction of that traffic level.

### 1NC---Turn

#### Hold a line from the 1AC ev to 1ar and 2ar spin this Edwards evidence just puts a laundry list of random impacts with 0 explanation for how nuclear war would drop the earth by 12 degrees and even less warrants for how any of these other scenarios happen – force them to actually justify the studies in their cards

#### Edwards is just based off of robock and toon’s studies

Edwards 17 [Paul N. Edwards, CISAC’s William J. Perry Fellow in International Security at Stanford’s Freeman Spogli Institute for International Studies. Being interviewed by EarthSky. How nuclear war would affect Earth’s climate. September 8, 2017. earthsky.org/human-world/how-nuclear-war-would-affect-earths-climate] Note, we are only reading parts of the interview that are directly from Paul Edwards -- MMG

In the nuclear conversation, what are we not talking about that we should be?

We are not talking enough about the climatic effects of nuclear war. The “nuclear winter” theory of the mid-1980s played a significant role in the arms reductions of that period. But with the collapse of the Soviet Union and the reduction of U.S. and Russian nuclear arsenals, this aspect of nuclear war has faded from view. That’s not good. In the mid-2000s, climate scientists such as Alan Robock (Rutgers) took another look at nuclear winter theory. This time around, they used much-improved and much more detailed climate models than those available 20 years earlier. They also tested the potential effects of smaller nuclear exchanges. The result: an exchange involving just 50 nuclear weapons — the kind of thing we might see in an India-Pakistan war, for example — could loft 5 billion kilograms of smoke, soot and dust high into the stratosphere. That’s enough to cool the entire planet by about 2 degrees Fahrenheit (1.25 degrees Celsius) — about where we were during the Little Ice Age of the 17th century. Growing seasons could be shortened enough to create really significant food shortages. So the climatic effects of even a relatively small nuclear war would be planet-wide. What about a larger-scale conflict? A U.S.-Russia war currently seems unlikely, but if it were to occur, hundreds or even thousands of nuclear weapons might be launched. The climatic consequences would be catastrophic: global average temperatures would drop as much as 12 degrees Fahrenheit (7 degrees Celsius) for up to several years — temperatures last seen during the great ice ages. Meanwhile, smoke and dust circulating in the stratosphere would darken the atmosphere enough to inhibit photosynthesis, causing disastrous crop failures, widespread famine and massive ecological disruption. The effect would be similar to that of the giant meteor believed to be responsible for the extinction of the dinosaurs. This time, we would be the dinosaurs. Many people are concerned about North Korea’s advancing missile capabilities. Is nuclear war likely in your opinion? At this writing, I think we are closer to a nuclear war than we have been since the early 1960s. In the North Korea case, both Kim Jong-un and President Trump are bullies inclined to escalate confrontations. President Trump lacks impulse control, and there are precious few checks on his ability to initiate a nuclear strike. We have to hope that our generals, both inside and outside the White House, can rein him in. North Korea would most certainly “lose” a nuclear war with the United States. But many millions would die, including hundreds of thousands of Americans currently living in South Korea and Japan (probable North Korean targets). Such vast damage would be wrought in Korea, Japan and Pacific island territories (such as Guam) that any “victory” wouldn’t deserve the name. Not only would that region be left with horrible suffering amongst the survivors; it would also immediately face famine and rampant disease. Radioactive fallout from such a war would spread around the world, including to the U.S. It has been more than 70 years since the last time a nuclear bomb was used in warfare. What would be the effects on the environment and on human health today? To my knowledge, most of the changes in nuclear weapons technology since the 1950s have focused on making them smaller and lighter, and making delivery systems more accurate, rather than on changing their effects on the environment or on human health. So-called “battlefield” weapons with lower explosive yields are part of some arsenals now — but it’s quite unlikely that any exchange between two nuclear powers would stay limited to these smaller, less destructive bombs.

#### They have bad models that assumes the smoke ends up the atmosphere, it doesn’t – rainout

**Seitz 6** – Visiting Scholar at Harvard’s Center of International Affairs (Russell, “The ‘Nuclear Winter’ Meltdown”  http://adamant.typepad.com/seitz/2006/12/preherein\_honor.html)

Dark smoke clouds in the lower atmosphere don’t last long enough to spread across the globe. Cloud droplets and rainfall remove them. Rapidly washing them out of the sky in a matter of days to weeks- not long enough to sustain a global pall. Real world weather brings down particles much as soot is scrubbed out of power plant smoke by the water sprays in smoke stack scrubbers. **Robock acknowledges this- not** even **a single degree of cooling results when soot is released at lower elevations in his models**. The workaround is to inject the imaginary aerosol at truly Himalayan elevations - pressure altitudes of 300 millibar and higher , where the computer model's vertical transport function modules pass it off to their even higher neighbors in the stratosphere , where it does not rain and particles linger. The new studies like the old suffer from the disconnect between a desire to paint the sky black and the vicissitudes of natural history. As with many exercise in worst case models both at invoke rare phenomena as commonplace, claiming it prudent to assume the worst. But the real world is subject to Murphy's lesser known second law- if everything must go wrong, don't bet on it. In 2006 as in 1983 firestorms and forest fires that send smoke into the stratosphere rise to alien prominence in the modelers re-imagined world , but in the real one remains a very different place, where though every month sees forest fires burning areas the size of cities - 2,500 hectares or larger , stratospheric smoke injections arise but once in a blue moon. So how come these neo-nuclear winter models feature so much smoke so far aloft for so long? The answer is simple- the modelers intervened. Turning off vertical transport algorithms may make Al Gore happy- he has bet on reviving the credibility Sagan's ersatz apocalypse , but there is no denying that in some of these scenarios human desire, not physical forces accounts for the vertical hoisting of millions of tons of mass ten vertical kilometers into the sky.to the level at which the models take over , with results at once predictable --and arbitrary. This is not physics, it is computer gamesmanship carried over to a new generation of X-Box. I must now return to getting and vetting the new papers and their references- this has been a prelimnary examination of what the public has been told, and more detailed critiques of the science will doubtless be direected to the journals were the new work appeared . This time round , the details are scarcely worth arguing, because the global frost made famous by the original 'TTAPS' model has disappeared . From the truly frigid 7,000 degree-day "baseine case" advertised as hard science in 1983 to a tepid results of today, "Nuclear Winter has well and truly melted down. The 1986 review of TTAPS reception follows. *The Melting of 'Nuclear Winter'*

#### Newest research proves even worst-case nuclear winter is survivable – assumes secondary effects, fallout, arsenal sizes,

**Rodriguez 20** [Luisa Rodriguez is research fellow at the Forethought Foundation for Global Priorities Research. Previously, she researched nuclear war at Rethink Priorities and as a visiting researcher at the Future of Humanity Institute, "What is the likelihood that civilizational collapse would directly lead to human extinction (within decades)? - EA Forum", 24th Dec 2020, <https://forum.effectivealtruism.org/posts/GsjmufaebreiaivF7/what-is-the-likelihood-that-civilizational-collapse-would#Concrete_example__A_large_nuclear_war_that_causes_a_nuclear_winter//imp>]

Case 2: 90% population loss, infrastructure damage, and extreme climate change (e.g. nuclear war that caused nuclear winter) In a scenario in which a catastrophe causes the deaths of 90% of the population (800 million survivors), major infrastructure damage, and climate change — for example, a severe, global nuclear war that caused a nuclear winter — I believe the question of whether humans would be able to meet their basic needs becomes more difficult.[14] The questions I consider for this scenario are: What is the likelihood that survivors are able to continue to survive using traditional forms of agriculture, given a catastrophe that causes severe infrastructure damage and climate change? What is the likelihood that radiation causes extinction? What is the likelihood that humanity would survive in the event of conflict immediately following the catastrophe? What is the likelihood that survivors are able to continue to survive using traditional forms of agriculture? Time spent on this section: 2–3 hours Types of sources: Academic literature, non-academic reports, and expert interviews Expert judgment: Several experts, including ALLFED director David Denkenberger, have affirmed this conclusion — they do not expect humanity to dip below the minimum viable population even in relatively extreme sun-blocking scenarios. Literature review: The nature of all of the catastrophes we know of that would cause extreme global cooling (e.g. nuclear winter, asteroid impacts) **would have unevenly distributed impacts** — causing extreme global cooling in some parts of the world, but more moderate cooling in others. For example, in the case of a nuclear war between the US and Russia, nuclear winter models suggest that the most **severe climate effects would be limited** to the Northern Hemisphere, where temperatures would fall by 10–30 degrees C. But in the Southern Hemisphere, and especially at the equator, those effects would be much less severe: between 5–10 degrees Celsius. With heterogeneous impacts like this, it’s likely that agriculture would still be possible in some regions — especially in New Zealand and Australia, and possibly in South America and Central Africa.[15] To be clear, I’m describing a very grim scenario, in which basically everyone in the Northern Hemisphere — and in many parts of the Southern Hemisphere — would be unable to grow food using standard agricultural techniques. Given this, I expect there would be mass starvation and violent competition and conflict until a new equilibrium was reached, one where the remaining survivors didn’t exceed the Earth’s carrying capacity. While I expect this would be a truly terrible period of widespread suffering, I believe this equilibrium would be reached long before the population got anywhere near the minimum viable population. My best guess is the population would fall to hundreds of thousands to tens of millions, but not much lower. While I haven’t looked into this much, I feel fairly convinced that hundreds of thousands or **millions** of people **could survive** using traditional approaches to agriculture in parts of the world with more moderate climate effects (and basic mitigation strategies, like switching to crop types that are more resilient to temperature and precipitation fluctuations). And as with Case 1, at least some of the survivors in a Case 2 scenario would probably be able to survive the immediate aftermath of a catastrophe that caused civilizational collapse by exploiting food and other supplies in stores and larger stockpiles. This would give survivors some buffer time to learn additional skills required to survive once those supplies run out (e.g. fishing) or develop the techniques necessary to produce food using methods that don’t rely on climate factors like warm temperatures and regular precipitation. BOTEC: The longer the buffer time, the more likely humanity would be to subsequently survive. But there are a number of different considerations (relative to Case 1) that affect the calculus of just how long such a grace period would be in the context of a catastrophic event like a nuclear war that killed 90% of people and caused a nuclear winter. So I’ve done a similar exercise to the one above where I try to account for some of those differences. Note: As above, the following BOTEC relies on particularly poor sources, makes a bunch of dubious assumptions (discussed more below), and I’m not confident I’ve thought of all of the most important supplies. It should be considered very rough. TABLE5 See table note here.[16] Bottom line: I think it’s extremely likely that these supplies would last somewhere between around a year and a decade or more. I expect it would be closer to the lower end, given that competition and violence could lead to the depletion of supplies more quickly than if the population were reduced to a smaller number by the catastrophe directly. All this in mind, I think it is very likely that the survivors would be able to learn enough during the grace period to be able to feed and shelter themselves ~indefinitely. What is the likelihood that radiation causes extinction? Time spent on this section: 2–3 hours Types of sources: Academic papers, Wikipedia, and interviews with experts Literature review: In the aftermath of a nuclear war, radioactive fallout from the nuclear detonations would have long-lasting health impacts. In **the most extreme** nuclear war **scenario**s considered by academics (a nuclear war between the US and Russia and their allies, using 10,000 megatons (MT) of nuclear bombs), approximately 30% of the geographic area in the Northern Hemisphere would have enough fallout to be lethal to any adult in the area (Ehrlich et al., 1983). The current US and Russian nuclear arsenals don’t currently have that kind of megatonnage (they currently have closer to 2,500 MT). If we naively assume that radiation scales linearly, we might expect a modern day US-Russia nuclear war to contaminate up to 7.5% of the land area of the Northern Hemisphere. This may not sound like much, but consider that 95% of the world’s population lives on just 10% of its land area — meaning that 7.5% of land area could be home to millions or even billions of people. What’s more, tens to hundreds of millions more might be exposed to enough radiation to be more susceptible to cancer for the rest of their lives. On top of this, there are currently around 440 civilian nuclear power reactors scattered around the world, and likely tens or hundreds more military reactors. These have fail-safes and automatic shut down measures that are designed to ensure that all of the nuclear material in these reactors would be safely contained in the event of a global catastrophe that meant people stopped attending to them. Concretely, these fail safes make sure that water continues to be circulated around the nuclear fuel to ensure it doesn’t get so hot it causes a meltdown — i.e., an event where the nuclear core partially or completely melts, which might allow the nuclear fuel to breach its multiple layers of containment and leak out into the environment. If fuel did reach the environment, the radioactive fallout could spread across continents, creating exposure levels ranging from immediately fatal (in areas ranging from tens to thousands of square kilometers) to non-lethal but causing potential higher rates of cancer and infertility. But some of these fail-safes could plausibly fail during a catastrophe that caused infrastructure damage (or afterward, if any components of the fail system degraded). For example, some nuclear reactors rely on backup generators to power the pumps that keep water circulating in the core of the reactor. If those backup generators eventually all broke down, the reactor might melt down. I currently don’t have a good sense of how likely these failures would be. Newer nuclear reactors rely on more robust safety systems, with parts that wouldn’t break down as easily. And all nuclear reactor safety systems are designed to account for infrastructure damage caused by earthquakes and other physical shocks. But in a large-scale nuclear war, it seems very plausible that at least some nuclear reactors would melt down. My best guess is that this wouldn’t happen at a large scale, but even if it did, some areas would likely be far enough away from reactors to be spared the radioactive contamination. For example, Australia has just one nuclear reactor. Even if that reactor were to melt down, much of Australia would likely remain uncontaminated (Australia is just under 3 million square miles, and the Chernobyl meltdown is estimated to have contaminated under 60,000 square miles; and only a much smaller fraction of that area was sufficiently contaminated as to be lethal to humans). Bottom line: While radioactive fallout from nuclear detonations and power plant meltdowns would increase the death toll in the years following the collapse, I expect it **wouldn’t be** widespread enough to be immediately **fatal to everyone**, nor would it cause fertility rates or life expectancy to decrease enough to threaten extinction. And at the very least, **some** areas **are sufficiently far away as to be** relatively **safe** from radioactive fallout. What is the likelihood that humanity would survive in the event of conflict immediately following the catastrophe? Time spent on this section: 1–2 hours Types of sources: Academic literature, expert interviews, and speculation Historical base rate: In Case 2, it seems slightly more plausible to me that violence would lead to human extinction than in Case 1, but still fairly unlikely. I don’t think human extinction could be caused by a conflict fought with conventional weapons; **there would** just **be** **too many survivors (~800 million)** to be killed in conventional warfare (compare this to WWI and WWII, during which ~20 million and ~75 million people were killed, respectively). Weapons of mass destruction: My best guess is that the only way violence in the wake of a Case 2 civilizational collapse could directly lead to human extinction is if one group of **survivors** had access to and deployed weapons of mass destruction. This seems unlikely to me, first because it seems hard to imagine a group of survivors incapable of recovering critical infrastructure — and barely capable of meeting even their basic needs — would be able to successfully deploy weapons of mass destruction (though I’m not very confident about this). Second, it’s hard to imagine a scenario where the use of weapons of mass destruction kills millions of survivors, spread all over the world, without modern technologies like transportation. For example, with potentially many survivor groups, it seems hard to imagine how nuclear detonations would kill ~everyone despite the fact that the groups would likely be spread out all over the world, potentially in small bands that can’t each be individually targeted. Similarly, it’s hard to imagine how a pathogen could spread ~everywhere when survivors would likely have greatly reduced mobility (the latter isn’t obviously impossible, but it at least seems exceedingly difficult to me). There’s one counterargument I find somewhat persuasive, which is that it seems possible that all of the survivors might be confined to a relatively small area (for example, if only a small fraction of the Earth’s land area is habitable), making them more vulnerable to a single, large attack. If this were the case, it’s easier for me to imagine that the use of weapons of mass destruction could kill all of the remaining survivors. This would presumably mean the aggressors would be killing themselves, which makes it seem even less likely to me. But we’ve seen humans come dangerously close to threatening their own survival before, often because human aggressors aren’t always good at predicting how cascading effects could threaten their survival as well. A random example to make this concrete: If all of the survivors of a nuclear war were confined to Australia, which might be less impacted by a nuclear winter, one group might choose to use nuclear weapons against another group, not realizing that the radioactive fallout or further climate change could make Australia uninhabitable, even for them. Bottom line: I expect the survivors in Case 2 would not deploy weapons of mass destruction against their competitors, as it would likely pose a pretty big risk to the aggressor as well as the target. But I’m uncertain about this — humans have come close to making similarly self-destructive choices before. Thankfully, even if one group did use weapons of mass destruction against their competitors, I still think it’s very unlikely that their use would cause human extinction. This is because except in a few very specific and very strange scenarios, I expect the survivors would be too geographically distributed and disconnected to be wiped out by a single act of aggression. I therefore expect the result would be a much higher death toll, but not extinction. Concrete example: A large nuclear war that causes a nuclear winter So what, concretely, do I think would happen in the event of a catastrophe like a nuclear war that led to the death of 90% of the population, and caused severe infrastructure damage and significant global cooling? I expect that, in addition to the billions of people killed in the initial catastrophe, hundreds of millions or more would likely die in the famines and violent competition that followed. But my best guess is that hundreds of thousands to hundreds of millions of the survivors of the initial catastrophe would survive this violent period. I think it’s extremely likely these survivors would be able to support themselves using leftover food stocks and supplies, before eventually working out how to feed themselves through traditional agriculture and fishing and/or modified agriculture (using methods that don’t rely on climate factors like warm temperatures and regular precipitation). **All of the catastrophes** we know of **that would lead to extreme cooling** would only do so **for** 1–**10 years, and agriculture would become possible again once the climate began to return to normal**. At that point, it seems even more likely that the surviving humans would be able to meet their own basic needs by returning to traditional forms of agriculture. My key uncertainties are around whether I’m putting too much weight on the idea that humans would figure out how to subsist without traditional agriculture just because it’s technically possible, and whether conflict could lead to extinction through channels I haven’t foreseen. Another toy calculation suggests that these **uncertainties** probably **aren’t troubling enough to change my bottom line**. Note: I again assume each group’s fate is independent of the fates of other groups. I actually think this is a pretty reasonable assumption in this case. I expect that the **survivors** of a catastrophe like a severe nuclear war **would end up somewhat spread out** (at least across the Southern Hemisphere), as doing so would create less competition for resources within a smaller area (I discuss this more later). The farther apart the surviving groups are, the less likely they are to be affected by the same shocks (natural disasters, disease outbreaks, conflict). Additionally, in the event of a catastrophe like a nuclear war, transportation, communication, and other technologies that facilitate contact between geographically distributed groups would be enormously limited. This would further limit the extent to which each group’s fate ended up relating to another’s. There would be other sources of variation between groups that made their fates less correlated: Some groups might be made up mostly of farmers, while others will be made up of lawyers, some groups will tend toward cooperation, while others toward conflict, plus pure randomness (e.g. some groups might have a high proportion of survivors with genetic immunity to a particular disease). But there are also factors that point in the other direction — factors that suggest the surviving groups would be at least somewhat correlated. For example, nuclear winter climate conditions, while nonuniform, would nonetheless impact all surviving groups. Similarly, more severe natural disasters might affect large regions, meaning that at least all of the survivor groups at the regional level might end up experiencing very similar challenges to survival simultaneously. Likewise, there might be things about "human nature" that would be shared amongst all survivors. For example, it’s possible that all of the survivors, having witnessed the initial catastrophe, would have similar psychological experiences — like shock, stress, and social distrust, among others — that would make it more difficult to survive and cooperate. As above, the higher the true correlation between survivor groups, the more my toy calculations will cause me to underestimate the probability that all of the survivor groups would be wiped out. TABLE6 With 800 million survivors, the degree of pessimism you have to have about their ability to survive to end up believing that no groups would survive indefinitely is actually kind of extreme. The exact beliefs you’d have to have would depend on whether survivors were concentrated into a few big groups, or distributed in many smaller ones. Specifically: Even if you thought any given group of 100, 1,000, or 10,000 survivors had a 99% chance of being wiped out, it would still be virtually guaranteed that at least one group would survive. If you thought there was a 99% chance that any one of 800 groups of 100,000 people would be wiped out, there would still only be a 1 in 3,000 chance of extinction. The probability of extinction is higher (45%) if you believe that larger groups of 10 million would also have a 99% chance of being wiped out. But, again, to hold that view, you’d have to think that out of a group of 10 million people (again, bigger than the largest US city), not even a few hundred of those people would overcome the obstacles of the post-collapse environment (how to fish, how to farm despite global cooling, avoiding being killed by a hurricane or drought). I do not find this view very plausible. Similarly, the probability of extinction is very high indeed if you think that any given group of 100 million survivors has a 99% chance of being wiped out. Again, to believe extinction risk was that high, you’d have to think that there would be a 99% chance that none of the 100 million people would work out how to survive (for reference, only 14 countries have a population of 100 million or higher). Given all of this, my subjective judgment is that **it’s very unlikely that this scenario would more or less directly lead to human extinction.**

#### War now spurs disarm – otherwise, nuclear war is inevitable

Daniel **Deudney 18**. Associate Professor of Political Science at Johns Hopkins University. 03/15/2018. “The Great Debate.” The Oxford Handbook of International Security. www.oxfordhandbooks.com, doi:10.1093/oxfordhb/9780198777854.013.22. //reem

Although nuclear war is the oldest of these technogenic threats to civilization and human survival, and although important steps to restraint, particularly at the end of the Cold War, have been achieved, the nuclear world is increasingly changing in major ways, and in almost entirely dangerous directions. The third “bombs away” phase of the great debate on the nuclear-political question is more consequentially divided than in the first two phases. Even more ominously, most of the momentum lies with the forces that are pulling states toward nuclear-use, and with the radical actors bent on inflicting catastrophic damage on the leading states in the international system, particularly the United States. In contrast, the arms control project, although intellectually vibrant, is largely in retreat on the world political stage. The arms control settlement of the Cold War is unraveling, and the world public is more divided and distracted than ever. With the recent election of President Donald Trump, the United States, which has played such a dominant role in nuclear politics since its scientists invented these fiendish engines, now has an impulsive and uninformed leader, boding ill for nuclear restraint and effective crisis management. Given current trends, it is prudent to assume that sooner or later, and probably sooner, nuclear weapons will again be the used in war. But this bad news may contain a “silver lining” of good news. Unlike a general nuclear war that might have occurred during the Cold War, such a nuclear event now would probably not mark the end of civilization (or of humanity), due to the great reductions in nuclear forces achieved at the end of the Cold War. Furthermore, politics on “the day after” could have immense potential for positive change. The survivors would not be likely to envy the dead, but would surely have a greatly renewed resolution for “never again.” Such an event, completely unpredictable in its particulars, would unambiguously put the nuclear-political question back at the top of the world political agenda. It would unmistakeably remind leading states of their vulnerability It might also trigger more robust efforts to achieve the global regulation of nuclear capability. Like the bombings of Hiroshima and Nagasaki that did so much to catalyze the elevated concern for nuclear security in the early Cold War, and like the experience “at the brink” in the Cuban Missile Crisis of 1962, the now bubbling nuclear caldron holds the possibility of inaugurating a major period of institutional innovation and adjustment toward a fully “bombs away” future.

#### That’s good – war later is worse

**Turchin & Denkenberger 18** [Alexey Turchin & David Denkenberger. Turchin is a researcher at the Science for Life Extension Foundation; Denkenberger is with the Global Catastrophic Risk Institute (GCRI) @ Tennessee State University, Alliance to Feed the Earth in Disasters (ALLFED). 09/2018. “Global Catastrophic and Existential Risks Communication Scale.” Futures, vol. 102, pp. 27–38.]

2. “Civilizational collapse risks” As most human societies are fairly complex, a true civilizational collapse would require a drastic reduction in human population, and the break-down of connections between surviving populations. Survivors would have to rebuild civilization from scratch, likely losing much technological abilities and knowledge in the process. Hanson (2008) estimated that the minimal human population able to survive is around 100 people. Like X risks, there is little agreement on what is required for civilizational collapse. Clearly, different types and levels of the civilizational collapse are possible (Diamond, 2005) (Meadows, Randers, & Meadows, 2004). For instance, one definition of the collapse of civilization involves, collapse of long distance trade, widespread conflict, and loss of government (Coates, 2009). How such collapses relate to existential risk needs more research. 3. “Human extinction risks” are risks that all humans die, and no future generations (in the extended sense mentioned above) will ever exist. 4. “All life on Earth ends risks” involve the extinction of all life on earth. As this includes H. sapiens, such risks are at the very least on a par with human extinction, but are likely worse as the loss of biodiversity is higher, and (without life arising a second time) no other civilizations, human or otherwise, would be possible on Earth. 5. “Astronomical scale risks” include the demise of all civilizations in the affectable universe. This of course includes human extinction, and all life on Earth, and so again are at the very least on a par, and very likely much worse outcomes, than those two. 6. “S-risks” include collective infinite suffering (Daniel, 2017). These differ from extinction risks insofar as extinction leads to a lack of existence, whereas this concerns ongoing existence in undesirable circumstances. These also vary in scale and intensity, but are generally out of scope of this work. Even with a focus squarely on X Risk, global catastrophic risks and civilizational collapse are critically important. This is because there is at least some likelihood that global catastrophic risks increase the probability of human extinction risks—and the more extreme end of civilizational collapses surely would. Before shifting to a discussion of probability appropriate to X risk, we’ll discuss some reasons to link these kinds of risk. First, global risks may have a fat tail—that is a low probability of high consequences—and the existence of such fat tails strongly depend on the intrinsic uncertainty of global systems (Ćirković, 2012) (Baum, 2015), (Wiener, 2016) (Sandberg & Landry, 2015). This is especially true for risks associated with future world wars, which may include not only nuclear weapons, but weapons incorporating synthetic biology and nanotechnology, different AI technologies, as well as Doomsday blackmail weapons (Kahn, 1959). Another case are the risks associated with climate change, where runaway global warming is a likely fat tail (Obata & Shibata, 2012a), (Goldblatt & Watson, 2012). Second, global catastrophes could be part of double catastrophe (Baum, Maher, & Haqq-Misra, 2013) or start a chain of catastrophes (Tonn & and MacGregor, 2009), and in this issue (Karieva, 2018). Even if a single catastrophic risk is insufficient to wipe us out, an unhappy coincidence of such events could be sufficient, or under the wrong conditions could trigger a collapse leading to human extinction. Further, global catastrophe could weaken our ability to prepare for other risks. Luke Oman has estimated the risks of human extinction because of nuclear winter: “The probability I would estimate for the global human population of zero resulting from the 150 Tg of black carbon scenario in our 2007 paper would be in the range of 1 in 10,000 to 1 in 100,000” (Robock, Oman, & Stenchikov, 2007), (Shulman, 2012). Tonn also analyzed chains of events, which could result in human extinction and any global catastrophe may be a start of such chain (Tonn and MacGregor, 2009). Because this, we suggest that any global catastrophe should be regarded as a possible cause of human extinction risks with no less than 0.01 probability. Similarly, scenarios involving civilization collapses also plausibly increase the risk of human extinction. If civilization collapses, recovery may be slowed or stopped for a multitude of reasons. For instance, easily accessible mineral and fossil fuel resources might be no longer available, the future climate may be extreme or unstable, we may not regain sufficient social trust after the catastrophe’s horrors, the catastrophe may affect our genetics, a new endemic disease could prevent high population density, and so on. And of course, the smaller populations associated with civilization collapse are more vulnerable to being wiped out by natural events. We estimate that civilization collapse has a 0.1 probability of becoming an existential catastrophe. In section 4, this discussion will form the basis of our analysis of an X risk’s “severity”, which is the main target of our scale. Before getting there, however, we should first discuss the difficulties of measuring X risks, and related worries regarding probabilities. 3. Difficulties of using probability estimates as the communication tool Plain probability estimates are often used as an instrument to communicate X risks. An example is a claim like “Nuclear war could cause human extinction with probability P”. However, in our view, probability measures are inadequate, both for measuring X risks, and for communicating those risks. This is because of conceptual difficulties (3.1), difficulty in providing meaningful measurements (3.2), the possibility of interaction effects (3.3) and the measurement’s inadequacy for prioritization (3.4) purposes. After presenting these worries, we argue that the magnitude of probabilities is a better option, which we use in our tool (3.5). 3.1 Difficulties in defining X risk probabilities Frequentism applies to X risks only with difficulty. One-off events don’t have a frequency, and multiple events are required for frequentist probabilities to apply. Further, on a frequentist reading, claims concerning X risks cannot be falsified. Again, this is because in order to infer from occurrences to probability, multiple instances are required. Although these conceptual and epistemic difficulties may be analyzed and partly overcome in technical scientific and philosophical literature, they would overcomplicate a communication tool. Also, discussion of X risks sometimes involves weird probabilistic effects. Consider, for example, what (Ćirković, Sandberg, & Bostrom, 2010) call the ‘anthropic shadow’. Because human extinction events entail a lack of humans to observe the event after the fact, we will systematically underestimate the occurrence of such events in an extreme case of survivorship bias (the Doomsday Argument (Tegmark & Bostrom, 2005) is similar). All of this makes the probabilities attached to X risks extremely difficult to interpret, bad news for an intended communication tool, and stimulates obscure anthropic reasoning. In addition, the subtle features involved in applying frequentism to one-off events, would otherwise tamper with our decision making process. 3.2 Data & X Risk There are little hard data concerning global risks from which probabilities could be extracted. The risk of an asteroid impact is fairly well understood, both due to the historical record, and because scientists can observe particular asteroids and calculate their trajectories. Studies of nuclear winter (Denkenberger & Pearce, 2016), volcanic eruptions, and climate change also provide some risk probability estimates, but are less rigorously supported. In all other cases, especially technological risks, there are many (often contradicting) expert opinions, but little hard data. Those probability calculations which have been carried out are based on speculative assumptions, which carry their own uncertainty. In the best case, generally, only the order of magnitude of the catastrophe’s probability can be estimated. Uncertainty in GCRs is so high, that predictions with high precision are likely to be meaningless. For example, surveys could produce such meaningless over-precision. A survey on human extinction probability gave an estimate of 19 percent in the 21st century (Sandberg & Bostrom, 2008). Such measurements are problematic for communication, because probability estimates of global risks often do not include corresponding confidence intervals (Garrick, 2008). For some catastrophic risks, uncertainty is much larger than for others, because of objective difficulties in their measurement, as well as subjective disagreements between various approaches (especially in the case of climate change, resource depletion, population growth and other politicized areas). As we’ll discuss below, one response is to present probabilities as magnitudes. 3.3 Probability density, timing and risks’ interactions Two more issues with using discrete frequentist probabilities for communicating X risks are related to probability density and the interactions between risks. For the purpose of responding to the challenges of X risk, the total probability of an event is less useful than the probability density: we want to know not only the probability but the time in which it is measured. This is crucial if policy makers are to prioritize avoidance efforts. Also, probability estimates of the risks are typically treated separate: interdependence is thus ignored. The total probability of human extinction caused by risk A could strongly depend on the extinction probability caused by risks B and C and also of their timing. (See also double catastrophes discussed by Baum, Maher, & HaqqMisra, 2013 and the integrated risk assessment project (Baum, 2017). Further, probability distributions of different risks can have different forms. Some risks are linear, others are barrier-like, other logistical. Thus, not all risks can be presented by a single numerical estimate. Exponentially growing risks may be the best way to describe new technologies, such as AI and synthetic biology. Such risks cannot be presented by a single annual probability. Finally, the probability estimation of a risk depends on whether human extinction is ultimately inevitable. We assume that if humanity becomes an interstellar civilization existing for millions of years, it will escape any near-term extinction risks; the heat death of the universe may be ultimate end, but some think even that is escapable (Dvorsky, 2015). If near-term extinction is inevitable, it is possible to estimate which risks are more probable to cause human extinction (like actuaries do in estimating different causes of death, based in part on the assumption that human death is inevitable). If near-term human extinction is not inevitable, then there is a probability of survival, which is (1- P(all risks)). Such conditioning requires a general model of the future. If extinction is inevitable, the probability of a given risk is just a probability of one way to extinction compared to other ways. 3.4 Preventability, prioritizing and relation to the smaller risks Using bare probability as a communication tool also ignores many important aspects of risks which are substantial for decision makers. First, a probability estimate does not provide sufficient guidance on how to prioritize prevention efforts. A probability estimate does not say anything about the risk’s relation to other risks, e.g. its urgency. Also, if a risk will take place at a remote time in the future (like the Sun becoming a red giant), there is no reason to spend money on its prevention. Second, a probability estimate does not provide much information about the relation of human extinction risks, and corresponding smaller global catastrophic risks. For example, a nuclear war probability estimate does not disambiguate between chances that it will be a human extinction event, a global catastrophic event, or a regional catastrophe. Third, probability measures do not take preventability into account. Hopefully, measures will be taken to try and reduce X risks, and the risks themselves have individual preventability. Generally speaking, it ought to be made clear when probabilities are conditional on whether prevention is attempted or not, and also on the probability of its success. Probability density, and its relation with cumulative probability could also be tricky, especially as the probability density of most risks is changing in time. 3.5 Use of probability orders of magnitude as a communication tool We recommend using magnitudes of probabilities in communicating about X risk. One way of overcoming many of the difficulties of using probabilities as communication tool described above is to estimate probabilities with fidelity of one or even two orders of magnitude, and do it over large fixed interval of time, that is the next 100 years (as it the furthest time where meaningful prognoses exist). This order of magnitude estimation will smooth many of the uncertainties described above. Further, prevention actions are typically insensitive in to the exact value of probability. For example, if a given asteroid impact probability is 5% or 25%, needed prevention action will be nearly the same. For X risks, we suggest using probability intervals of 2 orders of magnitude. Using such intervals will often provide meaningful differences in probability estimates for individual risks. (However, expert estimates sometimes range from “inevitable” to “impossible”, as in AI risks). Large intervals will also accommodate the possibility of one risk overshadowing another, and other uncertainties which arise from the difficulties of defining and measuring X-risks. This solution is itself inspired by The Torino scale of asteroid danger, which we discuss in more detail below. The Torino scale has five probability intervals, each with a two order of magnitude difference from the next. Further, such intervals can be used to present uncertainty in probability estimation. This uncertainty is often very large for even approximately well-defined asteroid risks. For example, Garrick (Garrick, 2008) estimated that asteroid impacts on the contiguous US with at least 10 000 victims to have expected frequency between once 1: 1900 and 1: 520 000 years with 90 percent confidence. In other words, it used more than 2 orders of magnitude uncertainty. Of course, there is a lot more to be said about the relationship between X risks and probability—however here we restrict ourselves to those issues most crucial for our purpose, that is, designing a communication tool for X risks. 4. Constructing the scale of human extinction risks 4.1. Existing scales for different catastrophic risks In section 2 we established the connection between global catastrophic risks, civilizational collapse risks, human extinction and X risks; we explored the difficulty of the use of probabilities as a communication tool for X risks in section 3; now we can construct the scale to communicate the level of risk of all global catastrophic and X risks. Our scale is inspired by the Torino scale of asteroid danger which was suggested by professor Richard Binzel (Binzel, 1997). As it only measures the energy of impact, it is not restricted to asteroids but applies to many celestial bodies (comets, for instance). It was first created to communicate the level of risk to the public, because professionals and decision makers have access to all underlying data for the hazardous object. The Torino scale combines a 5 level color code and 11 level numbered codes. One of the Torino scale’s features is that it connects the size and the probability using diagonal lines, i.e., an event with a bigger size and smaller probability warrants the same level of attention as smaller but more probable events. However, this approach has some difficulties, as was described by (Cox, 2008). There are several other scales of specific global risks based on similar principles: 1. Volcanic explosivity index, VEI, 0-8, (USGS, 2017) 2. DEFCON (DEFense readiness CONdition, used by the US military to describe five levels of readiness), from 5 to 1. 3. “Rio scale” of the Search for Extra-Terrestrial Intelligence (SETI) – complex scale with three subscales (Almar, 2011). 4. Palermo scale of asteroid risks compares the likelihood of the detected potential impactor with the average risk posed by objects of the same size measured both by energy and frequency (NASA, 2017). 5. San-Marino scale of risks of Messaging to Extra-Terrestrial Intelligence (METI) (Almar, 2007). The only more general scale for several global risks is the Doomsday Clock by the Bulletin of the Atomic Scientists, which shows global risks as minutes before midnight. It is oriented towards risks of a nuclear war and climate change and communicates only emotional impact (The Bulletin of the Atomic Scientists, 2017). 4.2. The goals of the scale How good a scale is depends in part on what it is intended to do: who will use it and how will they use it. There are three main groups of people the scale addresses: Public. Simplicity matters: a simple scale is required, similar to the hurricane Saffir-Simpson scale (Schott et al., 2012). This hurricane ACCEPTED MANUSCRIPT 13 measuring scale has 5 levels which present rather obscure wind readings as corresponding to the expected damage to houses and thus can help the public make decisions about preparedness and evacuation. In the case of X risks, personal preparedness is not very important, but the public make decisions about which prevention projects to directly support (via donations or crowdfunding) or voting for policymakers who support said projects. Simplicity is necessary to communicate the relative importance of different dangers to a wide variety of nonexperts. Policymakers. We intend our scale to help initiate communication of the relative importance of the risks to policymakers. This is particularly important as it appears that policymakers tend to overestimate smaller risks (like asteroid impact risks) and underestimate larger risks (like AI risks) (Bostrom, 2013). Our scale helps to make such comparison possible as it does not depend on the exact nature of the risks. The scale could be applicable to several groups of risks thus allowing comparisons between them, as well as providing a perspective across the whole situation. Expert community. Even a scale of the simplicity we suggest may benefit the expert community. It can act as a basis for comparing different risks by different experts. Given the interdisciplinarity inherent in studying X risk, this common ground is crucial. The scale could facilitate discussion about catastrophes’ probabilities, preventability, prevention costs, interactions, and error margins, as experts from different fields present arguments about the importance of the risks on which they work. Thus it will help to build a common framework for the risk discussions. 4.3. Color codes and classification of the needed actions Tonn and Steifel suggested a six-level classification of actions to prevent X risks (Tonn & Steifel, 2017). They start from “do nothing” and end with “extreme war footing, economy organized around reducing human extinction risk”. We suggest a scale which is coordinated with Tonn and Steifel’s classification of actions (Table 1), that is our colors correspond to the needed level of action. Also, our colors correspond to typical nonquantifiable ways of the risks description: theoretical, small, medium, serious, high and immediate. We also add iconic examples, which are risks where the probability distribution is known with a higher level of certainty, and thus could be used to communicate the risk’s importance by comparison. Such ACCEPTED MANUSCRIPT 14 examples may aid in learning the scale, or be used instead of the scale. For instance, someone could say: “this risk is the same level as asteroid risk”. The iconic risks are marked bold in the scale. Iconic examples are also illustrated with the best-known example of that type of event. For example, the best known supervolcanic eruption was the Toba eruption 74,000 years ago (Robock et al., 2009). The Chicxulub impact 66 million years ago is infamous for being connected with the latest major extinction, associated with the non-avian Dinosaur extinction. The scale presents the total risk of one type of event, without breaking categories down into subrisks. For example, it estimates the total risks of all known and unknown asteroids, but not the risk of any particular asteroid, which is a departure from the Torino scale. Although the scale is presented using probability intervals, it could be used instead of probabilities if they are completely unknown, but other factors, such as those affecting scope and severity, are known. For example, we might want to communicate that AI catastrophe is a very significant risk, but its exact probability estimation is complicated by large uncertainties. Thus we could agree to represent the risk as red despite difficulties of its numerical estimation. Note that the probability interval (when it is known) for “red” is shorter and is only 1 order of magnitude, as it is needed to represent most serious risks and here we need better resolution ability. As it is a communication scale, the scientists using it could come to agreement that a particular risk should be estimated higher or lower in this scale. We don’t want to place too many restrictions on how different aspects of a risk’s severity (like preventability or connection with other risks) should affect risks coding, as it should be established in the practical use of the scale. However, we will note two rules: 1. The purple color is reserved to present extreme urgency of the risk 2. The scale is extrapolated from the smaller than extinction risks and larger than extinction risks in Table 2. (This is based on idea that smaller risks have considerable but unknown probability to become human extinction risks, and also on the fact that policy makers may implement similar measures for smaller and larger risks). 4.4. Extrapolated version of scale which accounts for the risk size In Table 2 we extend the scale to include smaller risks like civilization collapse and global catastrophic risks as well as on “larger” ACCEPTED MANUSCRIPT 15 risks like life extinction and universe destruction, in accordance with our discussion in section 2. This is necessary because: 1) Smaller risks could become larger extinction risks by starting chains of catastrophic events. 2) The public and policymakers will react similarly to human extinction level catastrophe and to a global catastrophe where there will be some survival: both present similar dangers to personal survival, and in both similar prevention actions are needed. [[TABLE 2 OMITTED]] 4.5. Accessing risks with shorter timeframes than 100 years In Table 2 above we assessed the risks for the next 100 years. However, without prevention efforts, some risks could approach a probability of 1 in less time: climate change, for instance. We suggest that the urgency of intervening in such cases may be expressed by increasing their color coding. Moreover, the critical issue is less the timing of risks, but the timing of the prevention measures. Again, although extreme global warming would likely only occur at the end of the 21st century, it is also true that cutting emissions now would ameliorate the situation. We suggest, then, three ranks which incorporate these shorter time-frame risks. Note that the timings relate to implementation of interventions not the timings of the catastrophes. 1) Now. This is when a catastrophe has started, or may start in any moment: The Cuban Missile Crisis is an historical example. We reserve purple to represent it. 2) “Near mode”. Near mode is roughly the next 5 years. Typically current political problems (as in current relations with North Korea) are understood in near mode. Such problems are appropriately explored in terms of planning and trend expectations. Hanson showed that people are very realistic in “Near mode”, but become speculative and less moral in “Far mode” thinking (Hanson, 2010). Near mode may require one color code increase. 3) “Next 2-3 decades”. Many futurists predict a Technological Singularity between 2030-2050: that is around 10-30 years from now (Vinge, 1993), (Kurzweil, 2006). As this mode coincides with an adult’s working life, it may also be called “in personal life time”. In this mode people may expect to personally suffer from a catastrophe, or be personally responsible for incorrect predictions. MIRI recently increased its estimation of the probability that AGI will appear around 2035 (MIRI, 2017), pushing AGI into “next 2-3 decades” mode. There is a consideration against increasing the color code too much for near-term risks, as that may lead to myopia regarding longterm risks of human extinction. There will always be smaller but more urgent risks, and although these ought to be dealt with, some resources ought to be put towards understanding and mitigating the longer term. ACCEPTED MANUSCRIPT 19 Having said this, in high impact emergency situations, short term overwhelming efforts may help to prevent impending global catastrophe. Examples include the Cuban missile crisis and fighting the recent Ebola pandemic in Western Africa. Such short-term efforts do not necessarily constrain our long-term efforts towards preventing other risks. Thus, short term global catastrophic and larger risks may get a purple rating. 4.6. Detailed explanation of risk assessment principles in the color coded scale In Table 3, we estimate the main global risks, according to the scale suggested in section 4.4. Table 3. Detailed explanation of the X risks scale Color code Examples of risks White Sun becomes red giant. Although this risk is practically guaranteed, it is very remote indeed. Natural false vacuum decay. Bostrom and Tegmark estimated such events as happening in less than one in 1 billion years, (that is 10-7 in a century) (Tegmark & Bostrom, 2005). Moreover, nothing can be done to prevent it. Green Gamma-ray bursts. Earth threatening gamma-ray bursts are extremely rare, and in most cases they will result only in a crop failure due to UV increases. However, a close gamma-ray burst may produce a deadly muon shower which may kill everything up to 3 km in depth (A. Dar, Laor, & N.J, 1997). However, such events could happen less than once in a billion years (10-7 in a century) (Cirković & Vukotića, 2016). Such an event will probably kill all multicellular life on Earth. Dar estimates risks of major extinction events from gamma ray bursts as 1 in 100 mln years (A. Dar, 2001). Asteroid impacts. No dangerous asteroids have been thus far identified, and the background level of global catastrophic impacts is around 1 in a million years (10- 4 in a century). Extinction-level impact probability is 10-6 per century. There are several prevention options involving deflecting comets/asteroids. Also, food security could be purchased cheaply (Denkenberger, 2015). However, some uncertainty exists. Some periods involve intense comet bombardment, and if we are in such a time investment in telescopes should be larger (Rampino & Caldeira, 2015). High energy accelerator experiments creating false vacuum decay/black hole/strangelet. Vacuum decay seems to have extremely low probability, far below 10-8 currently. One obvious reason for expecting such events to have very low probability is that similar events happen quite often, and haven’t destroyed everything as yet (Kent, 2004). However, we give this event a higher estimation for two reasons. First, as accelerators become more capable such events might become more likely. Second, the risks are at an astronomical scale: it could affect other civilizations in the universe. Other types of accelerator catastrophes, like mini-black hole or strangelet creation, would only kill Earth life. However, these are more likely, with one estimate being <2E-8 risk from a single facility (the Relativistic Heavy Ion Collider) (Arnon Dar, De Rújula, & Heinz, 1999), which should be coded white. There many unknowns about dangerous experiments (Sandberg & Landry, 2015). Overall, these risks should be monitored, so green is advisable. Yellow Supervolcanic eruption. Given historical patterns, the likelihood of living in a century containing a super volcanic eruption is approximately 10-3 (Denkenberger, 2014). However, the chance of human extinction resulting is ACCEPTED MANUSCRIPT 21 significantly lower than this. If such an eruption produces global crop failure, it could end current civilization. Conventional wisdom is that there is nothing that could be done to prevent a super volcano from erupting, but some possible preventive measures have been suggested (Denkenberger, this issue). We estimate supervolcanic risks to be higher than asteroid impacts because of the historical record, as they likely nearly finished us off 74 000 ago (Robock et al., 2009). Natural pandemic. A natural pandemic is fairly likely to kill 1% (to an order of magnitude) of the global population during this century, as the Spanish flu did. However, such a pandemic is very unlikely to cause total extinction because lethality is under 100% and some populations are isolated. Between all natural pandemics, emerging pandemic flus have a shorter timespan and need much more attention. Bird flu has a mortality above 0.5 (WHO, 2017) and could produce widespread chaos and possible civilizational collapse if human-to-human transmission starts. Therefore, we estimate 10% probability this century of 10% mortality. Global warming triggering global catastrophe. According to the IPCC anthropogenic global warming may affect billions of people by the end of the 21st century (Parry, 2007), causing heat waves, crop failures and mass migration. Those events, and downstream consequences such as conflicts, could conceivably kill 1 billion people. However, this would only occur for tail risk scenarios which have order of magnitude 1% probability. Having said this, several experts think that methane release from permafrost and similar positive feedback loops may result in runaway global warming with much larger consequences (Obata & Shibata, 2012). Orange Full-scale nuclear war. There is roughly 0.02-7% chance per year of accidental full-scale nuclear war between the US and Russia (Barrett, Baum, & Hostetler, 2013). With fairly high probabilities of nuclear winter and civilization collapse given nuclear war, this is order of magnitude 10% this century. We should also take into consideration that despite reductions in nuclear weapons, a new nuclear arms race is possible in the 21st century. Such a race may include more devastating weapons or cheaper manufacturing methods. Nuclear war could include the creation of large cobalt bombs as doomsday weapons or attacks on nuclear power plants. It could also start a chain of events which result in civilization collapse. Nanotechnology risks. Although molecular manufacturing can be achieved without self-replicating machines (Drexler & Phoenix, 2004), technological fascination with biological systems makes it likely that self-replicating machines will be created. Moreover, catastrophic uses of nanotechnology needn’t be due to accident, but also due to the actions of purposeful malignant agents. Therefore, we estimate the chance of runaway self-replicating machines causing “gray goo” and thus human extinction to be one per cent in this century. There could also be extinction risks from weapons produced by safe exponential molecular manufacturing. See also (Turchin, 2016). Artificial pandemic and other risks from synthetic biology. An artificial multipandemic is a situation in which multiple (even hundreds) of individual viruses created through synthetic biology are released simultaneously either by a terrorist state or as a result of the independent activity of biohackers (Turchin, Green, & Dekenbergern, 2017). Because the capacity to create such a multipandemic could arrive as early as within the next ten to thirty years (as all the needed technologies already exist), it could overshadow future risks, like nanotech and AI, so we give it a higher estimate. There are also other possible risks, connected with synthetic biology, which are widely recognized as serious (Bostrom, 2002). Agricultural catastrophe. There is about a one per cent risk per year of a ten per cent global agricultural shortfall occurring due to a large volcanic eruption, a medium asteroid or comet impact, regional nuclear war, abrupt climate change, or extreme weather causing multiple breadbasket failures (Denkenberger 2016). This could lead to 10% mortality. Red AI risks. The risks connected with the possible creation of non-aligned Strong AI are discussed by (Bostrom, 2014), (Yudkowsky, 2008), (Yampolskiy & Fox, 2013) and others. It is widely recognized as the most serious X risk. AI could start an “intelligence explosion wave” through the Universe, which could prevent appearance of the other civilizations before they create their own AI. Purple Something like the Caribbean crisis in the past, but larger size. Currently, there are no known purple risks. If we could be sure that Strong AI will appear in the next 100 years and would probably be negative, it would constitute a purple risk. Another example would be the creation of a Doomsday weapon that could kill our species with global radiation poisoning (much greater ionizing radiation release than all of the current nuclear weapons) (Kahn, 1959). A further example would be a large incoming asteroid being located, or an extinction level pandemic has begun. These situations require quick and urgent effort on all levels.

#### War also unlocks a world government

**Cabrera 14** [Luis Cabrera, Associate Professor in the School of Government & International Relations and Griffith Asia Institute, “Global Government and the Sources of Globoscepticism”, *Millennium: Journal of International Studies*, <https://journals.sagepub.com/doi/full/10.1177/0305829814541833>, December 18, 2014, imp]

Today, however, few would argue that the very near-term creation of a world government, involving the sort of direct surrender of significant aspects of sovereignty in the ways sought in the 1940s heyday, is possible. There have been some indications of broad support for more inclusive suprastate governance, but these do not clearly equate to support for the kinds of integration and cession of sovereignty sought by global government advocates. For commentators such as Deudney, who offers a highly sophisticated treatment of reasons to pursue limited world government to control nuclear weapons, the conclusion is that states would not be willing to surrender their nuclear codes etc., **unless they were spurred to action by some dramatic event such as a regional nuclear conflict**. Then, it is presumed, the fear of a more global nuclear war and its inherent risk to all persons could well generate the support needed.26

#### Global wars drive calls for world government

**Chase-Dunn 12** [Christopher Chase-Dunn, Distinguished Professor of Sociology and Director of the [Institute for Research on World-Systems](http://www.irows.ucr.edu/)at the University of California-Riverside, Hiroko Inoue, Research Assistant at the Institute of Research on World-Systems, “Accelerating democratic global state formation”, <https://journals.sagepub.com/doi/full/10.1177/0010836712443168>, June 6, 2012, imp, \*\*we do not endorse this cards pathetic non-utilitarianism]

All the previous advances in global governance have taken place after a hegemon has declined and there has been a world war among rivals. H. G. Wells saw the importance of catastrophes in the emergence of a new civilization (Wagar, 1961). The idea here is that **major** organizational **changes** tend to **emerge after huge catastrophes** when the existing institutions are in disarray and need to be rebuilt and when people are sufficiently disgusted with the old failed institutions that have led to disaster.15 Of course, political actors who seek to promote the emergence of an effective and democratic global state must also do all that they can to try to prevent another war among the great powers because humanistic morality must trump whatever advantages might result from such a catastrophe. This said, many believe that it is rather likely that major calamities will occur in the coming decades regardless of the efforts of far-sighted world citizens and social movements. And it would make both tactical and strategic sense to have plans for how to move forward if indeed a perfect storm of calamities were to come about.

#### disarm movements are latent now

**Ragheb 18** [Magdi Ragheb, Prof. @ Department of Nuclear, Plasma, and Radiological Engineering, University of Illinois at Urbana-Champaign. 08-08-18. “Safeguards, Non -Proliferation, and Peaceful Nuclear Energy.” <http://mragheb.com/NPRE%20402%20ME%20405%20Nuclear%20Power%20Engineering/Safeguards%20Non%20Proliferation%20and%20Peaceful%20Nuclear%20Energy.pdf> //reem

The “axiom of proliferation” states that as long as some states cling to the possession of nuclear weapons, others will also seek to acquire them. According to “catastrophe theory,” **serious nuclear disarmament** is apparently **waiting** for some **event** that would **stir action** toward the **eventual goal of humanity to eliminate nuclear weapons**. An analogy is advanced of a village fully aware about the need to build gates along railroad tracks that pass through it, remaining **inactive** then **spring into action** until the time that one of its residents is **hit by a passing train**.

#### Our argument is supported by history --- Every empirical example of effective arms control followed a nuclear crisis

Matthew **Fuhrmann 16**. Associate professor of political science at Texas A&M University. 11/2016. “After Armageddon: Pondering the Potential Political Consequences of Third Use.” Should We Let the Bomb Spread? edited by Henry D. Sokolski, United States Army War College Press, <http://www.dtic.mil/dtic/tr/fulltext/u2/1021744.pdf>. //reem

The discussion in this section so far assumes that the third use of nuclear weapons would negatively affect the nonproliferation regime. It is also possible, and somewhat paradoxical, that nuclear use would result in a stronger regime. The international community often reacts to disasters by instituting sweeping reforms. Most of the major improvements to the nonproliferation regime since 1970 resulted from crises of confidence in existing measures. India’s nuclear test in 1974 led to the creation of the Nuclear Suppliers Group (NSG), a cartel designed to regulate trade in nuclear technology and materials. Iraq’s violations of the NPT prior to the 1991 Persian Gulf War caused the international community to give the International Atomic Energy Agency (IAEA), the main enforcer of the NPT, more teeth through the 1997 Additional Protocol. In addition, the international community sought to strengthen global export controls by passing United Nations Security Council Resolution 1540 after the public exposure of the A. Q. Khan network, a Pakistani-based operation that supplied nuclear weapon-related technology to Iran, Libya, and North Korea. As these examples illustrate, sweeping reforms are sometimes possible in a time of crisis. The third use of nuclear weapons would no doubt be horrific. It might, therefore, create a broad international consensus to strengthen nonproliferation norms in an attempt to lower the odds that the bomb would be used a fourth time. This does not imply that the third use of nuclear weapons would be a good thing. The negative consequences would outweigh any marginal improvement in the nonproliferation regime resulting from nuclear use.

#### States are motivated by fear – elevating the nuclear threat via use would cause global buy-in for a world state

**Sargent 19** [Brianna Sargent, “THE HOBBESIAN STATE OF NATURE AMONG NATIONS”, Undergraduate Thesis @ Ashland University Honors College, <https://etd.ohiolink.edu/apexprod/rws_etd/send_file/send?accession=auhonors1556751283322051&disposition=inline>, April 2019, imp]

Were the threat great enough, the nations would either form an international government with an assembly to represent each nation or allow one man or one government to rule over them all. This threat would have to be a threat to the very existence of each nation. This principle of **existential fear controls all nations** and why they have not exited the state of nature to be under one sovereign. As of now, there is no threat that scares nations enough to give up their own sovereignty, but if a threat of this magnitude were to be felt, then a world government would be absolutely necessary to the survival of the nations and the world.

#### Military leaders check the impact

**Ladish 20** [Jeffery Ladish, Biologist, Existential Risk Consultant @ Gordian Research, an existential risk consulting firm, “Nuclear war is unlikely to cause human extinction”, https://jeffreyladish.com/Nuclear\_war\_is\_unlikely\_to\_cause\_human\_extinction/, November 7th, 2020, imp]

C: Nuclear war planners are aware of nuclear winter risks and can incorporate these risks into their targeting plans

A very simple way to reduce risks from nuclear winter is to refrain from targeting cities with nuclear weapons. The proposed mechanism behind nuclear winter results from cities burning, not ground bursts on military targets. I’ve spoken with some of the officials in the US defense establishment responsible for nuclear war planning, and they’re well aware of the potential risks from nuclear winter. Of course, being aware of the risks does not guarantee they will have reasoned about the risks well, or have engaged in good risk management practices. However, the fact that this risk is well publicized makes it more likely that nuclear war planners will take steps to minimize blowback risk from climate effects.

It’s hard to know to what extent this has been done. Nuclear war plans are classified, and [as far as we know](https://www.lesswrong.com/posts/rn2duwRP2pqvLqGCE/does-the-us-nuclear-policy-still-target-cities) current US nuclear war plans do target cities under some circumstances but not under others. However, the defense establishment has access to classified information and models that we civilians do not have, in addition to all the public material. I’m confident that nuclear war planners have thought deeply about the risks of climate change from nuclear war, even though I don’t know their conclusions or bureaucratic constraints. All else being equal, the knowledge of these risks makes military planners less likely to accidentally cause human extinction.

#### Nuclear war weakens or destroys the states most likely to resist transition

**Martin 82** (Brian, Professor of Social Sciences at the University of Wollongong. “How the Peace¶ Movement Should be Preparing for Nuclear War,” Bulletin of Peace Proposals, Vol. 13, No. 2, 1982, pp. 149-159)

As well as encouraging moves towards repressive rule, the political and social upheaval resulting from nuclear war could also provide major opportunities for rapid social change in progressive directions. Several factors would operate here.¶ (a) There would be worldwide anguish and outrage at any significant use of nuclear weapons against populations. This emotion could easily turn against established institutions.¶ (b) A nuclear war involving the US, Soviet Union and Europe would weaken or destroy the bases for imperialism and neocolonialism in poor countries, and stimulate widespread revolutionary action that could not be contained by local elites left without rich country support.¶ (c) In areas directly affected by nuclear attack, the destruction of established institutions would allow the creation of new structures.¶ Historically, periods of economic or military crisis often have preceded revolutionary change, though not always with desirable results. Crises provide opportunities for groups which are organised and able to take advantage of them.

#### Instability drives calls for world government – thousands of years of empirics prove

**Houghton 65** [Neal D. Houghton, University of Arizona, “THE CASE FOR WORLD GOVERNMENT AS AN OUTGROWTH OF THE UNITED NATIONS”, *THE WESTERN POLITICAL QUARTERLY,* Vol. 18, No. 3, link, <https://www.jstor.org/stable/446065>, September 1965, imp]

Man's demands for "world order" and "world government" have come most notably in periods of great regional disorder. Some identifiable periods of great disorder, with consequent demands for and efforts toward "world order," include: (1) the long disorderly period following the fall of the Roman Empire; (2) the Thirty Years' War of the seventeenth century and its long chaotic aftermath; (3) the basic social and political disturbances of the French Revolution and the Napoleonic era (when the frighteningly menacing ism in Europe was constitutionalism), which brought forth our first modem league of nations (the so-called "Concert of Europe") by way of the Quadruple-Quintuple Alliance; (4) the traumatic collapse of the prospectively western white man's capitalistic world - as it had looked in the 1890's to those for whom it had been arranged; (5) the inter-World War decades with our frantic and futile efforts to re-create the essence of that unrealistic world concept, for Asia and Europe, and to protect it from further disturbance by Germany, Japan, and Russia; and (6) the uniquely global and unprecedentedly complicated current and prospectively permanent great convulsive transition period - whose irrepressibly impelling forces have their roots running far back into the history of all continents. The intensity of man's crying-out for "world order" and "world government" may seem to be roughly in direct proportion to the extent and degree of the activating disorder.

#### International anarchy guarantees war makes threat response impossible

**Craig 8** [Campbell Craig, “The Resurgent Idea of World Government”, Ethics & International Affairs, <https://ciaotest.cc.columbia.edu/journals/cceia/v22i2/f_0007579_6441.pdf>, June 2008, imp]

Certainly, one of the most evident failures of the nation-state system in recent years has been its inability to deal successfully with problems that endanger much or most of the world’s population. As the world has become more globalized—economically integrated and culturally interconnected—individual countries have become increasingly averse to dealing with international problems that are not caused by any single state and cannot be fixed even by the focused efforts of individual governments. Political scientists refer to this quandary as the ‘‘collective action problem,’’ by which they mean the dilemma that emerges when several actors have an interest in eradicating a problem that harms all of them, but when each would prefer that someone else do the dirty work of solving it. If everyone benefits more or less equally from the problem’s solution, but only the actor that addresses it pays the costs, then all are likely to want to ‘‘free ride’’ on the other’s efforts. The result is that no one tackles the problem, and everyone suffers.

Several such collective action problems dominate much of international politics today, and scholars of course debate their importance and relevance to world government. Nevertheless, a few obvious ones stand out, notably the imminent danger of climate change, the difficulty of addressing terrorism, and the complex task of humanitarian intervention. All of these are commonly (though not universally) regarded as serious problems in need of urgent solutions, and in each case powerful states have repeatedly demonstrated that they would prefer that somebody else solve them.

The solution to the collective action problem has long been known: it requires the establishment of some kind of authoritative regime that can organize common solutions to common problems and spread out the costs fairly. This is why many scholars and activists concerned with acute global problems support some form of world government. These advocates are not so naive as to believe that such a system would put an effortless end to global warming, terrorism, or human rights atrocities, just as even the most effective national governments have not eradicated pollution or crime. The central argument in favor of a world-government approach to the problems of globalization is not that it would easily solve these problems, but that it is the only entity that can solve them

A less newsworthy issue, but one more central to many advocates of world government, is the persistent possibility of a third world war in which the use of megaton thermonuclear weaponry could destroy most of the human race. During the Cold War, nuclear conflict was averted by the specter of mutual assured destruction (MAD)—the recognition by the United States and the Soviet Union that a war between them would destroy them both. To be sure, this grim form of deterrence could well obtain in future international orders, but it is unwise to regard the Cold War as a promising model for future international politics. It is not at all certain that international politics is destined to return to a stable bipolar order, such as prevailed during the second half of the Cold War, but even if this does happen, there is no guarantee that nuclear deterrence would work as well as it did during the second half of the twentieth century. It is well to remember that the two sides came close to nuclear blows during the Cuban crisis, and this was over a relatively small issue that did not bear upon the basic security of either state. As Martin Amis has written, the problem with nuclear deterrence is that ‘‘it can’t last out the necessary timespan, which is roughly between now and the death of the sun.’’4 As long as interstate politics continue, we cannot rule out that in some future conflict a warning system will fail, a leader will panic, governments will refuse to back down, a third party will provoke a response— indeed, there are any number of scenarios under which deterrence could fail and thermonuclear war could occur

#### Only a world state solves extinction – outweighs on probability and magnitude

**Czarnecki 20** [Tony Czarnecki, Economist, founder of the Sustensis Think Tank, “Existential threats require a planet-wide approach managed by the World Government”, <https://sustensis.medium.com/existential-threats-require-a-planet-wide-approach-managed-by-the-world-government-cd496f746102>, October 29, 2020, imp]

We have heard a lot about an existential threat of Climate Change. But this is only one of about a dozen of such existential risks. Among them, the **most severe** is the threat of Artificial Intelligence and especially, its mature form — Superintelligence. **This is an existential threat of an entirely different magnitude**, which can either make our species extinct by a direct malevolent action, or by taking over the control over the future of Humanity. This risk is also different from Climate Change because it may come much earlier, within the next few decades. Secondly, we cannot stop (uninvent AI) — the proverbial genie is already out of the bottle. Incidentally, both Superintelligence (immature) and Climate Change have a tipping point at about 2030.

There is at least 20% chance that one of the man-made existential risks will materialize by the end of this century, making our species extinct. However, some experts, like prof. Martin Rees, or the late Stephen Hawking, assess such a risk as at least 50%. If we are to survive, we need to apply a planet-wide risk mitigation strategy managed by a powerful planetary organization. **We would need the World Government**, which if it is to be effective, would have to be created by the end of this decade.

1. <http://dictionary.reference.com/browse/negate>, <http://www.merriam-webster.com/dictionary/negate>, <http://www.thefreedictionary.com/negate>, <http://www.vocabulary.com/dictionary/negate>, <http://www.oxforddictionaries.com/definition/english/negate> [↑](#footnote-ref-1)
2. *Dictionary.com – maintain as true, Merriam Webster – to say that something is true, Vocabulary.com – to affirm something is to confirm that it is true, Oxford dictionaries – accept the validity of, Thefreedictionary – assert to be true* [↑](#footnote-ref-2)
3. <https://www.google.com/search?q=the+definition&rlz=1C1CHBF_enUS877US877&oq=the+definition&aqs=chrome..69i57j69i64j69i61j69i60l2.1976j0j7&sourceid=chrome&ie=UTF-8> //Xu [↑](#footnote-ref-3)
4. <https://www.google.com/search?q=of+definition&rlz=1C1CHBF_enUS877US877&oq=of+definition&aqs=chrome.0.69i59j69i61l3.1473j0j7&sourceid=chrome&ie=UTF-8> //Xu [↑](#footnote-ref-4)
5. <https://www.google.com/search?q=private+definition&rlz=1C1CHBF_enUS877US877&oq=private+&aqs=chrome.0.69i59j69i57j69i60j69i61.1372j0j7&sourceid=chrome&ie=UTF-8> //Xu [↑](#footnote-ref-5)
6. <https://www.merriam-webster.com/dictionary/entity> //Xu [↑](#footnote-ref-6)
7. <https://www.google.com/search?q=appropriation+definition&rlz=1C1CHBF_enUS877US877&oq=appr&aqs=chrome.0.69i59j69i57j69i59l2j69i60l3.1218j0j7&sourceid=chrome&ie=UTF-8> //Xu [↑](#footnote-ref-7)