# NC

## FW

#### The standard is maximizing expected wellbeing.

#### Extinction outweighs and comes first.

Pummer 15 [Theron, Junior Research Fellow in Philosophy at St. Anne's College, University of Oxford. “Moral Agreement on Saving the World” Practical Ethics, University of Oxford. May 18, 2015]

There appears to be lot of disagreement in moral philosophy. Whether these many apparent disagreements are deep and irresolvable, I believe there is at least one thing it is reasonable to agree on right now, whatever general moral view we adopt: that it is very important to reduce the risk that all intelligent beings on this planet are eliminated by an enormous catastrophe, such as a nuclear war. How we might in fact try to reduce such existential risks is discussed elsewhere. My claim here is only that we – whether we’re consequentialists, deontologists, or virtue ethicists – should all agree that we should try to save the world. According to consequentialism, we should maximize the good, where this is taken to be the goodness, from an impartial perspective, of outcomes. Clearly one thing that makes an outcome good is that the people in it are doing well. There is little disagreement here. If the happiness or well-being of possible future people is just as important as that of people who already exist, and if they would have good lives, it is not hard to see how reducing existential risk is easily the most important thing in the whole world. This is for the familiar reason that there are so many people who could exist in the future – there are trillions upon trillions… upon trillions. There are so many possible future people that reducing existential risk is arguably the most important thing in the world, even if the well-being of these possible people were given only 0.001% as much weight as that of existing people. Even on a wholly person-affecting view – according to which there’s nothing (apart from effects on existing people) to be said in favor of creating happy people – the case for reducing existential risk is very strong. As noted in this seminal paper, this case is strengthened by the fact that there’s a good chance that many existing people will, with the aid of life-extension technology, live very long and very high quality lives. You might think what I have just argued applies to consequentialists only. There is a tendency to assume that, if an argument appeals to consequentialist considerations (the goodness of outcomes), it is irrelevant to non-consequentialists. But that is a huge mistake. Non-consequentialism is the view that there’s more that determines rightness than the goodness of consequences or outcomes; it is not the view that the latter don’t matter. Even John Rawls wrote, “All ethical doctrines worth our attention take consequences into account in judging rightness. One which did not would simply be irrational, crazy.” Minimally plausible versions of deontology and virtue ethics must be concerned in part with promoting the good, from an impartial point of view. They’d thus imply very strong reasons to reduce existential risk, at least when this doesn’t significantly involve doing harm to others or damaging one’s character. What’s even more surprising, perhaps, is that even if our own good (or that of those near and dear to us) has much greater weight than goodness from the impartial “point of view of the universe,” indeed even if the latter is entirely morally irrelevant, we may nonetheless have very strong reasons to reduce existential risk. Even egoism, the view that each agent should maximize her own good, might imply strong reasons to reduce existential risk. It will depend, among other things, on what one’s own good consists in. If well-being consisted in pleasure only, it is somewhat harder to argue that egoism would imply strong reasons to reduce existential risk – perhaps we could argue that one would maximize her expected hedonic well-being by funding life extension technology or by having herself cryogenically frozen at the time of her bodily death as well as giving money to reduce existential risk (so that there is a world for her to live in!). I am not sure, however, how strong the reasons to do this would be. But views which imply that, if I don’t care about other people, I have no or very little reason to help them are not even minimally plausible views (in addition to hedonistic egoism, I here have in mind views that imply that one has no reason to perform an act unless one actually desires to do that act). To be minimally plausible, egoism will need to be paired with a more sophisticated account of well-being. To see this, it is enough to consider, as Plato did, the possibility of a ring of invisibility – suppose that, while wearing it, Ayn could derive some pleasure by helping the poor, but instead could derive just a bit more by severely harming them. Hedonistic egoism would absurdly imply she should do the latter. To avoid this implication, egoists would need to build something like the meaningfulness of a life into well-being, in some robust way, where this would to a significant extent be a function of other-regarding concerns (see chapter 12 of this classic intro to ethics). But once these elements are included, we can (roughly, as above) argue that this sort of egoism will imply strong reasons to reduce existential risk. Add to all of this Samuel Scheffler’s recent intriguing arguments (quick podcast version available here) that most of what makes our lives go well would be undermined if there were no future generations of intelligent persons. On his view, my life would contain vastly less well-being if (say) a year after my death the world came to an end. So obviously if Scheffler were right I’d have very strong reason to reduce existential risk. We should also take into account moral uncertainty. What is it reasonable for one to do, when one is uncertain not (only) about the empirical facts, but also about the moral facts? I’ve just argued that there’s agreement among minimally plausible ethical views that we have strong reason to reduce existential risk – not only consequentialists, but also deontologists, virtue ethicists, and sophisticated egoists should agree. But even those (hedonistic egoists) who disagree should have a significant level of confidence that they are mistaken, and that one of the above views is correct. Even if they were 90% sure that their view is the correct one (and 10% sure that one of these other ones is correct), they would have pretty strong reason, from the standpoint of moral uncertainty, to reduce existential risk. Perhaps most disturbingly still, even if we are only 1% sure that the well-being of possible future people matters, it is at least arguable that, from the standpoint of moral uncertainty, reducing existential risk is the most important thing in the world. Again, this is largely for the reason that there are so many people who could exist in the future – there are trillions upon trillions… upon trillions. (For more on this and other related issues, see this excellent dissertation). Of course, it is uncertain whether these untold trillions would, in general, have good lives. It’s possible they’ll be miserable. It is enough for my claim that there is moral agreement in the relevant sense if, at least given certain empirical claims about what future lives would most likely be like, all minimally plausible moral views would converge on the conclusion that we should try to save the world. While there are some non-crazy views that place significantly greater moral weight on avoiding suffering than on promoting happiness, for reasons others have offered (and for independent reasons I won’t get into here unless requested to), they nonetheless seem to be fairly implausible views. And even if things did not go well for our ancestors, I am optimistic that they will overall go fantastically well for our descendants, if we allow them to. I suspect that most of us alive today – at least those of us not suffering from extreme illness or poverty – have lives that are well worth living, and that things will continue to improve. Derek Parfit, whose work has emphasized future generations as well as agreement in ethics, described our situation clearly and accurately: “We live during the hinge of history. Given the scientific and technological discoveries of the last two centuries, the world has never changed as fast. We shall soon have even greater powers to transform, not only our surroundings, but ourselves and our successors. If we act wisely in the next few centuries, humanity will survive its most dangerous and decisive period. Our descendants could, if necessary, go elsewhere, spreading through this galaxy…. Our descendants might, I believe, make the further future very good. But that good future may also depend in part on us. If our selfish recklessness ends human history, we would be acting very wrongly.” (From chapter 36 of On What Matters)

**Only pleasure and pain are intrinsically valuable. All other values can be explained with reference to pleasure; it requires us to treat these as instrumentally valuable.**

**Moen 16** [Ole Martin Moen, Research Fellow in Philosophy at University of Oslo “An Argument for Hedonism” Journal of Value Inquiry (Springer), 50 (2) 2016: 267–281] SJDI

I think several things should be said in response to Moore’s challenge to hedonists. First, I do not think the burden of proof lies on hedonists to explain why the additional values are not intrinsic values. If someone claims that X is intrinsically valuable, this is a substantive, positive claim, and it lies on him or her to explain why we should believe that X is in fact intrinsically valuable. Possibly, this could be done through thought experiments analogous to those employed in the previous section. Second, **there is something peculiar about the list of additional intrinsic values** that counts in hedonism’s favor**: the listed values have a strong tendency to be well explained as things that help promote pleasure and avert pain.** To go through Frankena’s list, life and consciousness are necessary presuppositions for pleasure; activity, health, and strength bring about pleasure; and happiness, beatitude, and contentment are regarded by Frankena himself as “pleasures and satisfactions.” The same is arguably true of beauty, harmony, and “proportion in objects contemplated,” and also of affection, friendship, harmony, and proportion in life, experiences of achievement, adventure and novelty, self-expression, good reputation, honor and esteem. Other things on Frankena’s list, such as understanding, **wisdom, freedom, peace, and security, although they are perhaps not themselves pleasurable, are important means to achieve a happy life, and as such, they are things that hedonists would value highly.** Morally good dispositions and virtues, cooperation, and just distribution of goods and evils, moreover, are things that, on a collective level, contribute a happy society, and thus the traits that would be promoted and cultivated if this were something sought after**.** To a very large extent, the intrinsic values suggested by pluralists tend to be hedonic instrumental values. Indeed, pluralists’ suggested intrinsic values all point toward pleasure, for while the other values are reasonably explainable as a means toward pleasure, pleasure itself is not reasonably explainable as a means toward the other values. Some have noticed this. Moore himself, for example, writes that though his pluralistic theory of intrinsic value is opposed to hedonism, its application would, in practice, look very much like hedonism’s: “Hedonists,” he writes “do, in general, recommend a course of conduct which is very similar to that which I should recommend.”24 Ross writes that “[i]t is quite certain that by promoting virtue and knowledge we shall inevitably produce much more pleasant consciousness. These are, by general agreement, among the surest sources of happiness for their possessors.”25 Roger Crisp observes that “those goods cited by non-hedonists are goods we often, indeed usually, enjoy.”26 What Moore and Ross do not seem to notice is that their observations give rise to two reasons to reject pluralism and endorse hedonism. The first reason is that if **the suggested non-hedonic intrinsic values are potentially explainable by appeal to just pleasure and pain** (which, following my argument in the previous chapter, we should accept as intrinsically valuable and disvaluable), **then—by appeal to Occam’s razor—we have at least a pro tanto reason to resist the introduction of any further intrinsic values and disvalues.** It is ontologically more costly to posit a plurality of intrinsic values and disvalues, so in case all values admit of explanation by reference to a single intrinsic value and a single intrinsic disvalue, we have reason to reject more complicated accounts. The fact that suggested non-hedonic intrinsic values tend to be hedonistic instrumental values does not, however, count in favor of hedonism solely in virtue of being most elegantly explained by hedonism; it also does so in virtue of creating an explanatory challenge for pluralists**.** The challenge can be phrased as the following question: If the non-hedonic values suggested by pluralists are truly intrinsic values in their own right, then why do they tend to point toward pleasure and away from pain?27

#### Governments and policymakers are forced to use our framing – they can only understand averages and aggregates and what’s good for the most people. Bureaucrats aren’t philosophers, they only know a cost benefit analysis.

## CP

#### CP Text: United Nations Committee on the Peaceful Uses of Outer Space should

#### Establish that no entity has a right to mine celestial bodies without an approved application

#### Applications will be made public and expire after a set period

#### The right is published by the COPOUS

#### Exclusive mining rights are tradeable

#### The UNCOPOUS is not revenue oriented

#### Utilize a model of the ISA to ensure shared benefits

#### \*ISA = International Seabed Authority

#### The CP creates an international framework for sustainable private appropriation

Steffen 21, (Olaf Steffen Institute of Composite Structures and Adaptive Systems, German Aerospace Center (DLR), Lilienthalplatz 7, 38108 Braunschweig, Germany, “Explore to Exploit: A Data-Centred Approach to Space Mning Regulation), ScienceDirect, 12-2-21, https://www.sciencedirect.com/science/article/pii/S0265964621000515 // MNHS NL

The data gathered in the exploration of a [celestial body](https://www.sciencedirect.com/topics/social-sciences/astronomical-systems) is not only of value for space mining companies for informing them whether, where and how to exploit resources from the body in question, but also for science. The irretrievability of information relating to the solar system contained in the body that will be lost during resource exploitation carries a value for humanity and future generations and can thus be assigned the characteristic of a common heritage for all mankind as invoked in the Moon Agreement. This characteristic makes exploration data an exceptional and unique candidate for use in a mechanism for acquiring mining rights because its preservation is of public interest and its disclosure in exchange for exclusive mining rights does not place any additional burden on the mining company. The following principles would form the cornerstones of the proposed regulatory regime and rights acquisition mechanism based on exploration data: • Without preconditions, no entity has a right to mine the resources of a celestial body. • An international regulatory body administers the existing rights of companies for mining a specific celestial body. • Mining rights to such bodies can be applied for from this international regulatory body, with applications made public. The application expires after a pre-set period. • Mining rights are granted on the provision and disclosure of exploration data on the celestial body within the pre-set period, proposedly gathered in situ, characterising this body and its resources in a pre-defined manner. • The explorer's mining right to the resources of the celestial body is published by the regulatory body in a mining rights grant. • The data concerning the celestial body are made public as part of the rights grant within the domain of all participating members of the regulatory regime. • The exclusive mining rights to any specific body are tradeable. • The scope of the regulatory body with respect to the granting of mining rights is not revenue-oriented. The international regulatory body would thus act as a curator of a rights register and an attached database of exploration data. The concept is superficially comparable to patent law, where exclusive rights are granted following the disclosure of an invention to incentivise the efforts made in the development process. In the following section, the characteristics of such a regulatory regime are further discussed with respect to the formation of [monopolies](https://www.sciencedirect.com/topics/social-sciences/monopolies), market dynamics, conflict avoidance, inclusivity towards less developed countries and the viability of implementation.

#### The CP create sustainable development of space and solves the aff.

Steffen 21, (Olaf Steffen Institute of Composite Structures and Adaptive Systems, German Aerospace Center (DLR), Lilienthalplatz 7, 38108 Braunschweig, Germany, “Explore to Exploit: A Data-Centred Approach to Space Mning Regulation), ScienceDirect, 12-2-21, https://www.sciencedirect.com/science/article/pii/S0265964621000515 // MNHS NL

The transparency of where exploration spacecraft are located and, at a later stage, where mining activities take place, provides additional benefits for the sustainable use of space, trust building and deterrence against malign misuse of mining technology. Involuntary spacecraft collisions of competitors in deep space are prevented by the reduction of exploration efforts at the same destination through the application for mining rights by one applicant at a time. As pointed out by Newman and Williamson [[20](https://www.sciencedirect.com/science/article/pii/S0265964621000515" \l "bib20)], this is relevant because space debris does not de-orbit in deep space as in the case of LEO. Deep space may be vast, but the velocities involved mean that small debris particles are no less dangerous. Considering NEO mining with fleets of small spacecraft, malfunctions and/or destructive events could create debris clouds crossing Earth's orbit around the sun on a regular basis, presenting another danger to satellites in Earth's own orbit. Thus, by effectively preventing the collision of two spacecraft, one source of debris creation can be mitigated through this regulation mechanism. With respect to Deudney's [[11](https://www.sciencedirect.com/science/article/pii/S0265964621000515" \l "bib11)] scepticism of asteroid mining and the dual-use character of technology to manipulate orbits of celestial bodies, it has to be stated that this potential is truly inherent to asteroid mining. An asteroid redirect mission for scientific purposes was pursued by NASA [[49](https://www.sciencedirect.com/science/article/pii/S0265964621000515" \l "bib49)] before reorientation towards a manned lunar mission. In one way or another, each type of asteroid mining will require the delivery of the targeted resource to a destination via a comparable technology as formerly envisioned by NASA, be it as a raw material or a useable resource processed in situ, even if this is not necessarily done through redirecting the whole asteroid and placing it in a lunar orbit. However, to be misused as a weapon, space mined resources would have to surpass a certain mass threshold to survive atmospheric entry at the target. This seems unfeasible for currently discussed mining concepts using small-scale spacecraft as described in this article. Redirecting larger masses or whole asteroids would require far more powerful mining vessels or small amounts of thrust over long periods of time. The continuous, (for a mining activity) untypical change in the orbit of an asteroid would make a redirect attempt with hostile intent easily identifiable, effectively deterring such an activity in the first place by ensuring the identification of the aggressor long before the projectile hits its target. The proposed database would provide a catalogue of asteroids with exploration and mining activities in place that should be tracked more closely because of their interaction with spacecraft. This would, in fact, be necessary per se as a precaution to avoid catastrophic mishaps, such as the accidental change of a NEO's orbit to intercept Earth by changing its mass through mining.

#### **Utilizing a model similar to the ISA allows for sharing of space resources and deterring militarization.**

Chouhan 21 (Karan Singh Chouhan, Privatization of Outer-Space and Ownership: ISA As a Model of Regulation for Resource Exploitation. *CMR University Journal for Contemporary Legal Affairs, Vol 1, Issue 2, ISSN 2582-4805* 19 Pages Posted: 3 May 2021 <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3832673>) \*\*Bracketed for gendered language\*\*

* ISA = International Seabed Authority
* CLOS = Convention on the Law of the Sea

The emergence of private corporations in space exploration and their interest in space resource exploitation presents a challenge in front the international space law regime. It can be argued that the role of private space players can be positive as it can lead to more investment, research, innovation and commercialization which will benefit the [hu]mankind as a whole but at the same time unregulated commercialization or privatization of space may also lead to mayhem and creating a ‘wild-west’ in space with its militarization and such a scenario has to be avoided.67 Outer space is categorized as res-communes and a ‘heritage of mankind’ under the International Space Law. The concept of ‘heritage of mankind’ is not a new concept applied to outer space. This concept is already in use its application to the high seas and seabed where no nation can claim sovereignty over them as they belong to all of the mankind.68 There is a stark similarity between Oceans on earth and outer space as both cannot be appropriated as a whole and no country can claim them for itself. Considering that, it’s logical to learn from the lessons of 69 UNCLOS and applying these principles to the outer space for a 70 peaceful regulation of the exploitation activities. However, ‘Open Sea’ 71 concept gives the freedom of navigation and to exploit the fishing stocks in the high seas and thus such a principle cannot be applied in outer space for the reason that fish stocks are biological resources and can be replenished and same cannot be said about the outer space resources hence the analogy with Open ocean may fail. The model of International Seabed Authority (ISA) which regulates the deep seabed 73 mining and is the closest one that can be used to regulate the activities in space without creating friction and conflict. We have proven principle and legal theories in ISA which are working well and accepted by a large majority of countries, and there is a need to adopt these legal principles for the regulation of space resource exploitation. A. International Seabed Authority Model International Seabed Authority is established to regulate the use of seabed for resource extraction and mining. Like open ocean, the 74 seabed is also considered as the common heritage of mankind. Part XI 75 of UNCLOS also proclaims that no State can claim sovereignty over the seabed and all the rights over seabed belongs to mankind, and whose behalf the ISA will act. It further forbids the alienation of resource from 76 seabed, other than the authorization of the ISA, nor can any state claim any rights over the extracted resource unless it’s done according to the provisions of UNCLOS. The ISA fulfils its function of providing a 77 benefit to mankind by equitable sharing of financial and other economic benefits, and also, is instrumental in protecting the interest of the 78 developing countries by facilitating ‘transfer of technology’ so that even the poor countries can participate in resource extraction and such steps can lead to the development of mankind as a whole. Essentially, this model of resource extraction allows for the private appropriation, with the authorization of ISA, but with the condition that it leads to the sharing of the benefits as the resources are heritage of [hu]mankind. A 79 similar model, if applied in outer space can work as it provides the appropriate balance between several interests to keep militarization or conflict away but at the same time ensures that private entities have a role in the development of space frontiers as they can still keep heft amount of profit to themselves, while the benefits are getting shared among all the countries in an equitable manner. The Moon agreement also proposes the regulation model based on an equitable sharing of benefits and ISA is the best candidate to fulfill that condition. The ISA inspired 80 organization can work under the aegis of United Nations Committee on the Peaceful Uses of Outer Space (COPOUS) or it can be an independent body. Such an organization can provide charter-based rights for resource extraction from outer space and put a legal obligation on the basis of sharing the benefit, best proposal to recover and environmental regulation to prevent wastefulness. V. Conclusion We are living in a capitalistic era but it would be wrong to assume that it’s the ultimate economic ideology for human society. However, reality cannot be set aside for a hypothetical future, and **the important role that private corporations can play in outer space cannot be denied.** Unilateral action of US or any other country for privatization of outer space will only lead to conflict, even if we ignore that such actions are violating international law. It needs to be accepted that current legal regime is inadequate for the purpose of space resource exploitation as it lacks clarity. However, instead of unilateral action, a global governance model based on the principle of equity and ‘benefit of the [hu]mankind’ has to be developed. Space belongs to all of the mankind, it’s not a property 81 of one nation and hence state practice of one nation cannot decide the future for all of us. The Global governance model should be developed through international consensus, as the future of all the countries is at stake. In the 57th session of UNCOPUS held in 2018, one of the agenda of debate was consideration of potential legal model for activities in the exploration, exploitation and utilization of space resources. One of the 82 best potential models for the governance of outer space is the ISA, which has been discussed above. It is the best balance between exploitation of resources, respecting the role of private entities, but at the same time protecting the interest of the all of the mankind including developing and underdeveloped nations. Obviously, ISA cannot be transplanted as it is to the outer space and it has to be sui generis in nature, but outer space model of governance can be greatly inspired by the principle followed under ISA. Such a model can be the only way to ensure the International peace, prosperity and demilitarization of space.

## DA

#### Strong commercial space catalyzes tech innovation – it incentivizes progress and private space infrastructure and global info networks are key.

Joshua Hampson 2017, Security Studies Fellow at the Niskanen Center, 1-25-2017, “The Future of Space Commercialization”, Niskanen Center, https://republicans-science.house.gov/sites/republicans.science.house.gov/files/documents/TheFutureofSpaceCommercializationFinal.pdf

Innovation is generally hard to predict; some new technologies seem to come out of nowhere and others only take off when paired with a new application. It is difficult to predict the future, but it is reasonable to expect that a growing space economy would open opportunities for technological and organizational innovation. In terms of technology, the difficult environment of outer space helps incentivize progress along the margins. Because each object launched into orbit costs a significant amount of money—at the moment between $27,000 and $43,000 per pound, though that will likely drop in the future —each 19 reduction in payload size saves money or means more can be launched. At the same time, the ability to fit more capability into a smaller satellite opens outer space to actors that previously were priced out of the market. This is one of the reasons why small, affordable satellites are increasingly pursued by companies or organizations that cannot afford to launch larger traditional satellites. These small 20 satellites also provide non-traditional launchers, such as engineering students or prototypers, the opportunity to learn about satellite production and test new technologies before working on a full-sized satellite. That expansion of developers, experimenters, and testers cannot but help increase innovation opportunities. Technological developments from outer space have been applied to terrestrial life since the earliest days of space exploration. The National Aeronautics and Space Administration (NASA) maintains a website that lists technologies that have spun off from such research projects. Lightweight 21 nanotubes, useful in protecting astronauts during space exploration, are now being tested for applications in emergency response gear and electrical insulation. The need for certainty about the resiliency of materials used in space led to the development of an analytics tool useful across a range of industries. Temper foam, the material used in memory-foam pillows, was developed for NASA for seat covers. As more companies pursue their own space goals, more innovations will likely come from the commercial sector. Outer space is not just a catalyst for technological development. Satellite constellations and their unique line-of-sight vantage point can provide new perspectives to old industries. Deploying satellites into low-Earth orbit, as Facebook wants to do, can connect large, previously-unreached swathes of 22 humanity to the Internet. Remote sensing technology could change how whole industries operate, such as crop monitoring, herd management, crisis response, and land evaluation, among others. 23 While satellites cannot provide all essential information for some of these industries, they can fill in some useful gaps and work as part of a wider system of tools. Space infrastructure, in helping to change how people connect and perceive Earth, could help spark innovations on the ground as well. These innovations, changes to global networks, and new opportunities could lead to wider economic growth.

#### Technology developed in space innovation is key to resolve climate change

**Derr**, E. (20**21**, **September 17**). (Space is Crucial to Understanding Climate Change. Nuclear Energy Institute. Retrieved December 9, 2021, from <https://www.nei.org/news/2021/space-is-crucial-to-understanding-climate-change> Emma Derr works as a Manager, Digital Communications at Nuclear Energy Institute, which is a Membership Organizations company with an estimated 133 employees; and founded in 1994. They are part of the Digital Marketing team within the Marketing Department and their management level is Manager. Emma is currently based in Washington, D.C., United States.)

**Space developments in the last two decades have greatly contributed to our** [**understanding** of our planet’s **climate**](https://climate.nasa.gov/evidence/). **Satellite imaging, space exploration, and new technologies give us an idea of the big picture and how we can adapt to address climate change**. **For example, satellites in space have played a critical role in our understanding of the causes of global warming** by providing us with a large body of data to examine the variations in the Earth’s orbit. **Data from these** [capabilities](https://www.thespacereview.com/article/4230/1) **were essential inputs into the Intergovernmental Panel on Climate Change’s (IPCC) recent** [**report**](https://www.ipcc.ch/report/ar6/wg1/#SPM) **that focused on how the physical science of climate change informs likely impacts under five different emissions scenarios. The report also found that climate change is happening quicker than we thought,** making the need to reduce emissions imminent. To address this, space infrastructure such as [positioning, navigation, and timing](https://www.transportation.gov/pnt/what-positioning-navigation-and-timing-pnt#:~:text=While%20PNT%20encompasses%20so%20much,GPS%20is%20a%20major%20component.&text=%E2%80%9CA%20U.S.%2Downed%20utility%20that,segment%2C%20and%20the%20user%20segment.) (PNT) can help identify efficient transportation routes and sources of emissions, ultimately aiding mitigation efforts. Time Progression of the Ozone Hole Over Antarctica This series of images shows the size and shape of the thinning ozone layer over Antarctica each year from 1979-2019. Red and yellow areas indicate the ozone hole. Credit to nasa.gov. NASA’s [Earth System Observatory](https://www.nasa.gov/press-release/new-nasa-earth-system-observatory-to-help-address-mitigate-climate-change), the next generation of Earth science satellites that will launch in the next decade, reflect the importance of Earth imaging. This constellation of satellites is designed to provide information about our planet ranging from the location of forest fires to the sea level rise to our agricultural processes. It will be able to collect data at the regional and local levels and connect critical interactions between the atmosphere, land, ocean and ice, significantly bolstering our understanding of the Earth’s climate. Another large [focus](https://www.axios.com/white-house-nasa-earth-science-satellites-climate-c560c9d8-2dfd-4964-bfcf-fd6cb54117e5.html) of the initiative is predicting severe weather and answering questions surrounding aerosols, which are particles in the atmosphere that are a key source of uncertainty in predicting climate change. Alongside adding funding to FEMA, the Biden Administration [announced](https://www.whitehouse.gov/briefing-room/statements-releases/2021/05/24/fact-sheet-biden-administration-invests-1-billion-to-protect-communities-families-and-businesses-before-disaster-strikes/) the development of the Earth System Observatory, indicating its support for the program in understanding how climate change is impacting communities. **Space exploration is foundational to climate science** because it provides us with more information about the Earth, our solar system and the role of gases in our atmosphere, and nuclear energy has played an important role powering our missions into space**.** In 1969, NASA launched [Nimbus III](https://rps.nasa.gov/missions/8/nimbus-iii/), a nuclear-powered spacecraft, that is the first U.S. satellite to gather vital oceanographic data, such as measurements of sea ice and the ozone layer. The spacecraft also measured atmospheric temperature, water vapor and ozone, as well as the amount of ultraviolet radiation reaching our atmosphere from the sun. [Cassini](https://solarsystem.nasa.gov/missions/cassini/overview/), a nuclear-powered probe into Saturn and its moons, released the Huygens probe which collected important data about what earth may have looked like in its state before humans evolved. The mission revealed Titan to be one of the most Earth-like worlds we’ve encountered and has shed light on the history of our home planet. Nuclear energy has powered dozens of interplanetary missions, which have gathered critical information about our universe. These make up some of the most successful and inspiring missions in U.S. space exploration history. **Climate and space technologies build off of each other, as evidenced by solar photovoltaic panels first gaining a foothold in the space industry.** Nuclear energy can be positioned to experience such a catalyst with [new investments](https://www.nei.org/news/2021/nuclear-taking-us-faster-and-farther-into-space) in nuclear space technologies. As climate change intensifies, space exploration and Earth observation will become [increasingly important](https://www.axios.com/space-critical-to-climate-science-2051-0361889a-5ae9-47eb-960f-e83f1b6779c7.html) to gathering critical data. **We must meet the moment by investing in these missions and recognizing nuclear power’s important role in space technologies.**

**Warming causes extinction & turns every impact – no adaptation & each degree is worse**

**Krosofsky ’21** [Andrew, Green Matters Journalist, “How Global Warming May Eventually Lead to Global Extinction”, Green Matters, 03-11-2021, https://www.greenmatters.com/p/will-global-warming-cause-extinction]

Eventually, yes. **Global warming will invariably result in the mass extinction of millions of different species,** humankind included. In fact, **the Center for Biological Diversity says that global warming is currently the greatest threat to life on this planet**. **Global warming causes a number of detrimental effects on the environment that many species won’t be able to handle long-term**. Extreme weather patterns are shifting climates across the globe, eliminating habitats and altering the landscape. **As a result, food and fresh water sources are being drastically reduced**. Then, of course, **there are the rising global temperatures themselves, which many species are physically unable to contend with**. Formerly frozen arctic and antarctic regions are melting, increasing sea levels and temperatures. Eventually, **these effects will create a perfect storm of extinction conditions**. The melting glaciers of the arctic and the searing, **unmanageable heat indexes being seen along the Equator are just the tip of the iceberg, so to speak.** **The species that live in these climate zones have already been affected by the changes caused by global warming.** Take polar bears for example, whose habitats and food sources have been so greatly diminished that they have been forced to range further and further south. **Increased carbon dioxide levels in the atmosphere and oceans have already led to ocean acidification**. **This has caused many species of crustaceans to either adapt or perish and has led to the mass bleaching of more than 50 percent of Australia’s Great Barrier Reef**, according to National Geographic. According to the Center for Biological Diversity, the current trajectory of global warming predicts that more than 30 percent of Earth’s plant and animal species will face extinction by 2050. By the end of the century, that number could be as high as 70 percent. We won’t try and sugarcoat things, humanity’s own prospects aren’t looking that great either. According to The Conversation, **our species has just under a decade left to get our CO₂ emissions under control. If we don’t cut those emissions by half before 2030, temperatures will rise to potentially catastrophic levels. It may only seem like a degree or so, but the worldwide ramifications are immense.** The human species is resilient. We will survive for a while longer, even if these grim global warming predictions come to pass, **but it will mean less food, less water, and increased hardship across the world — especially in low-income areas and developing countries. This increase will also mean more pandemics, devastating storms, and uncontrollable wildfires**.

#### Climate change perpetrates slow violence that in turn expands oppression – turns the aff.

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The Paris Agreement, achieved December 12 at the twenty-first Conference of the Parties to the United National Framework Convention on Climate Change (UNFCCC COP21), has been heralded as a “[turning point for humanity](http://content.sierraclub.org/press-releases/2015/12/sierra-club-paris-climate-agreement-turning-point-humanity)” and “[a new type of international cooperation](http://www.wri.org/blog/2015/12/paris-agreement-turning-point-climate-solution).” In his remarks to the General Assembly following the close of COP21, UN Secretary General [Ban Ki-moon](http://www.un.org/press/en/2015/sgsm17417.doc.htm) called it “a triumph for people, the planet, and multilateralism.” More critical voices have pointed to the “[wrinkles](http://fpif.org/seven-wrinkles-paris-climate-deal/)” that mar the agreement, while influential climate scientist James Hanson has dismissed it as “[just worthless words](http://www.cbc.ca/news/technology/climate-scientists-paris-1.3366751).” Most commentary falls in a middle ground, viewing the agreement as an important, if faltering,[step in the right direction](http://www.economist.com/news/international/21683990-paris-agreement-climate-change-talks): even if we’re not entirely happy with what has been achieved, that something was achieved at all signals a “[political will](http://earthinnovation.org/2015/12/paris-unifying-global-political-will/)” for change. But the drama and significance of the COP as an event isn’t primarily about the emergence of an agreement. The history of international climate negotiations — with the exception of the spectacular failure at Copenhagen — boasts a long line of Outcomes, Accords, and even Protocols. Throughout, emissions have continued not only unabated, but [at an accelerated pace](https://www.ipcc.ch/pdf/ar5/pr_wg3/20140413_pr_pc_wg3_en.pdf). Bolivian president Evo Morales remarked on this uncomfortable truth at last year’s COP20 in Lima, when he admonished delegates for having little to show for over two decades of climate change negotiations other than “a heavy load of hypocrisy and neocolonialism.” The COP as an event, then, does not simply represent the failure to contend with the ongoing catastrophe of climate change. Its very process perpetrates what Rob Nixon calls the “slow violence” of climate change. Nixon uses this term to describe how contemporary imperialism transfers its toxic byproducts to peoples and ecosystems at the peripheries of the global economy, challenging us to recognize imperial violence in the cumulative, attritional, and mundane forms of death and disease that do not resolve into moments of spectacular destruction**. Climate change**, for Nixon, is the ultimate expression of slow violence, a “[temporal and geographical outsourcing](http://harvardpress.typepad.com/hup_publicity/2013/11/when-slow-violence-sprints-rob-nixon.html)” of environmental devastation to the most vulnerable populations and to future generations, a “discounting” of lives and livelihoods that cannot prove their worth in economic terms. But if climate change is “slow violence” in terms of its cumulative effects, it is equally slow in its execution — and nothing illustrates this quite so effectively as the trudging pace of international negotiations. Geopolitical power operates here in decidedly non-spectacular ways, through the procedural minutiae of negotiations over subtleties of wording. The drama of urgency around the production of an outcome distracts from the reality of negotiations as a long process of strategic refusal, whereby wealthy countries deny their historical responsibility for global emissions and thereby lock in catastrophic climate trajectories. Rather than heralding the success of an agreement or rejecting it outright as a failure, we should attend to the COP as an instance of slow violence in action.