### 1

#### Counterplan text: The Committee on the Peaceful use of Outer Space ought to establish an application system for property rights on celestial bodies. Applications and approval of property rights should be granted upon the condition of

#### open disclosure of data gathered in the exploration of a celestial body

#### Applications must be publicly announced

#### Property Rights will be made tradeable between private entities

#### Property Rights will be set to expire on the conclusion of a successful extraction mission

#### Private Entities will only be allowed one property right grant per celestial body and cannot have more than one grant at a time

#### The counterplan establishes international norms for safe extraction of resources on celestial bodies while increasing R&D in outer space.

**Steffen 21** [Olaf Steffen, Olaf is a scientist at the Institute of Composite Structures and Adaptive Sytems at the German Aerospace Center. 12-2-2021, "Explore to Exploit: A Data-Centred Approach to Space Mining Regulation," Institute of Composite Structures and Adaptive Systems, German Aerospace Center, [https://www.sciencedirect.com/science/article/pii/S0265964621000515 accessed 12/12/21](https://www.sciencedirect.com/science/article/pii/S0265964621000515%20accessed%2012/12/21)] Adam

4. The data-centred approach to space mining regulation

4.1. Core description of the regulatory regime and mining rights acquisition process

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.

4.2. Discussion and means of implementation

The proposed regulatory mechanism has advantages both from a business/investor and society perspective. First, it prevents already highly capitalised companies from acquiring exploitation rights in bulk to deny competitors those objects that are easiest to exploit or most valuable, which would otherwise be possible in any kind of pay-for-right mechanism and could result in preventing market access to smaller, emerging companies. Thus, early monopoly formation can be avoided.

The use of data disclosure for the granting of mining rights ensures the scientific community has access to this invaluable source of information. In this way, space mining prospecting missions can lead to a boost in research on small celestial bodies at a speed unmatchable by pure government/agency funded science probes. This usefulness to the scientific community could lead to sustained partnerships between prospecting companies and scientific institutions and could even provide a source of funding for the companies through R&D grants and public-private partnerships. The results of the exploration efforts contribute to research on the formation of planets and the history of the solar system and provide valuable insight for space defence against asteroids. The transition of exploration from a tailored mission profile with a purpose-built spacecraft to a standard task in space flight would also lead to a cost reduction of the respective exploration spacecraft through [economies of scale](https://www.sciencedirect.com/topics/social-sciences/economies-of-scale). This describes the very benefits Elvis [[24](https://www.sciencedirect.com/science/article/pii/S0265964621000515" \l "bib24)] and Crawford [[25](https://www.sciencedirect.com/science/article/pii/S0265964621000515" \l "bib25)] imagined as possible effects of a space economy. Thus, there is an immediate return for society from the exploitation rights grant. It also reconciles the adverse interests of space development and [space science](https://www.sciencedirect.com/topics/social-sciences/space-sciences) as laid out by Schwartz [[26](https://www.sciencedirect.com/science/article/pii/S0265964621000515" \l "bib26)]. It ensures that, by exploitation, information contained in celestial bodies is not lost for future generations.The application period should not be set in a manner that creates a situation that can be abused through the potential for stockpiling inventory rights. Rather, it is intended to prevent conflict in the phase before exploration data gathered by a mission, as a prerequisite to the mining rights grant, is available. In other words, only one exploration effort at a time can be permitted for a specific body. The time frame between the application and the granting of mining rights (meaning: availability of the required exploration data set) should be tight and should only consider necessary exploration time on site, transit time and possibly a reasonable launch preparation and data processing markup. These contributors to the application period make it clear that the time frame could be dynamic and individualistic, depending on the exploration target (transit time and duration of exploration) and the technology of the exploration probe (transit time). After the expiration of the application period, applications for the exploration target would again be permissible. To prevent the previously mentioned stockpiling of inventory rights, credible proof of an imminent exploration intention would need to be part of the application process, for example, a fixed launch contract or the advanced build status of the exploration probe. Such a mechanism would not contradict the statement in the OST that outer space shall be free for both exploration and scientific investigation. Applications would not apply to purely scientific exploration. An application would only be necessary as a prerequisite for mining. Even resource prospecting could take place without an application (for whatever reason), with a subsequent application comprising in situ data already gathered. For such cases, the application process would need to provide a short period for objections to enable the secretive explorer to make their efforts public. The publication of the application for the mining rights, which is nothing more than a statement of intention to explore, thus provides a strong measure for avoiding conflict.

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.

#### Space mining fails now due to profitability and unsafe tech which only the cp solves

**Steffen 21** [Olaf Steffen, Olaf is a scientist at the Institute of Composite Structures and Adaptive Sytems at the German Aerospace Center. 12-2-2021, "Explore to Exploit: A Data-Centred Approach to Space Mining Regulation," Institute of Composite Structures and Adaptive Systems, German Aerospace Center, [https://www.sciencedirect.com/science/article/pii/S0265964621000515 accessed 12/12/21](https://www.sciencedirect.com/science/article/pii/S0265964621000515%20accessed%2012/12/21)] Adam

* answers timeframe deficits
* creates solvency vs inequality/developing nation affs

The data-driven mechanism also addresses another potential risk of an emerging space-based resource economy: the reinforcing of the incontestable market positions of the market leaders based on an advantage in knowledge unattainable by new competitors. Explorations of celestial bodies will have a likelihood of failing from the perspective of the actual value of the explored object vs. the expected value. In this case, the costs of exploration would be a loss for the company, which could be significant and possibly ruinous considering the budgets needed for contemporary space agency-led exploration missions. Sanchez and McInnes [[5](https://www.sciencedirect.com/science/article/pii/S0265964621000515" \l "bib5)] explicitly mention the uncertainties in object distribution models used in their asteroid distribution study and for the conclusions drawn concerning reachable object masses with certain delta-v capabilities of spacecraft. With an increasing number of exploration missions led by a company, the data collected may lead to better in-house models and a higher probability of exploring the ‘right’ body for the value/resources aimed at. This may even provide information on the best spacecraft designs for matching the targeted objects’ orbit distribution. This risk is known from the digital platform economy, where the companies that are now leading have an uncatchable advantage in user data compared with market newcomers, translatable to a more refined and comfortable user experience, attracting additional users and thus offering superior services to business customers. This also holds true for space mining companies. Through their lack of legacy mission data, market newcomers would have a higher risk of misallocating exploration missions, making investments in those companies riskier than in established companies. To avoid the preferred investment in a single or a few companies, the risk of the investment in emerging companies is reduced by the proposed mechanism by ensuring the equal access to data for market newcomers and established companies alike. From a prospecting risk perspective, the market entrance of a new company becomes progressively less risky for investors with increasing amounts of publicly available exploration data, promoting progressive and dynamic development.

The long lead times of asteroid mining ventures coincide with a long time frame for an ROI. The exclusive mining rights granted after the exploration phase give investors security half-way into their space mining endeavours. The proposed tradability of the rights offers an early chance of gaining investment proceeds. It also offers the possibility of new business models: the classical asteroid mining system concept, as shown by Andrews et al. [[43](https://www.sciencedirect.com/science/article/pii/S0265964621000515" \l "bib43)], for example, covers exploration, exploitation and resource transfer. This maximises the investment needed to develop the technologies required for the entire process chain. Giving exploration a value could lead to a division of labour. Dedicated prospecting companies could emerge, providing mining companies with the data and mining rights to a body with the specific resource profile they are seeking. In this way, the investment needed for a successful mining endeavour is divided between different specialised companies. This considerably reduces the risk for investors as well as the investment needed for a company to meet their business goals, which are now aimed at just a particular part of the overall space mining endeavour. Third-party applications for mining rights should be possible to allow a mining company to subcontract to exploration companies. Such a regulatory mechanism design would also be more easily inclusive of less developed countries. They could simply contract exploration missions made affordable through economies of scale to become part of the emerging space mining economy as holders of tradeable mining rights. Through a wise selection of such missions’ targets, they could gain powerful positions of influence.

#### 1AC Babcock is entirely out of context – it is not saying that expanding the PTD on its own is sufficient to create sustainable space – it requires the creation of new international frameworks, guidelines, and debris mitigation efforts which is external to an expansion of the PTD – only the counterplan sets the ground floor for sustainable space development – independently your author concedes public space programs are not interested in a global common – we read blue

Babcock 19 (, H., 2019. THE PUBLIC TRUST DOCTRINE, OUTER SPACE, AND THE GLOBAL COMMONS: TIME TO CALL HOME ET. [online] Lawreview.syr.edu. Available at: <https://lawreview.syr.edu/wp-content/uploads/2019/09/H-Babcock-Article-Final-Document-v2.pdf#page=67> [Accessed 15 December 2021] Professor Babcock served as general counsel to the National Audubon Society from 1987-91 and as deputy general counsel and Director of Audubon’s Public Lands and Water Program from 1981-87. Previously, she was a partner with Blum, Nash & Railsback, where she focused on energy and environmental issues, and an associate at LeBoeuf, Lamb, Leiby & MacRae where she represented utilities in the nuclear licensing process. From 1977-79, she served as a Deputy Assistant Secretary of Energy and Minerals in the U.S. Department of the Interior. Professor Babcock has taught environmental and natural resources law as a visiting professor at Pace University Law School and as an adjunct at the University of Pennsylvania, Yale, Catholic University, and Antioch law schools. Professor Babcock was a member of the Standing Committee on Environmental Law of the American Bar Association, and served on the Clinton-Gore Transition Team.)-rahulpenu

Definitions of space sustainability The Secure World Foundation defines space sustainability as “ensuring that all humanity can continue to use outer space for peaceful purposes and socioeconomic benefit.”39 It is also described as “the ability of all humanity to continue to use outer space for peaceful purposes and socioeconomic benefit over the long term.” It is proposed that, read together, these broad definitions take as their premise that: (1) all humanity thus far is using space for peaceful purposes and for socioeconomic benefit; (2) this use is threatened; (3) measures must be taken to protect it; and (4) all humanity currently possesses the ability, in the sense of having a skill or the capacity, to ensure space sustainability for peaceful purposes. Under this conceptualization, the negative effect of not using space sustainably is primarily economic.40 Bearing in mind the governmental origins of space exploitation, where market economics did not play a primary role in decision making, the growing focus on the economic perspective in space affairs acknowledges Carolyn Deere’s opinion that problems emerge in the international domain from an absence of powerful economic interests.41 Of course, as more space applications are developed, economic interests become more prevalent in that market protectionism then underlies the rationales for many positions taken. Space sustainability is also conceptualized as defining good behavior, its boundaries, and disincentives for negative behavior in space.42 Space sustainability then becomes a much more limited political concept calling for specific measures to strengthen norms.43 Some notable examples follow: An International Code of Conduct—the European Union proposed a non-binding voluntary code whose purpose is “security, safety, sustainability” for all space activities providing for general measures on space operations and space debris.44 The Scientific and Technical Subcommittee of UNCOPUOS working group objective of establishing guidelines for the long-term sustainability of outer space activities. Proposed International Civil Aviation Organization for Space—the establishment of an international organization focused on space safety and the establishment of binding safety standards similar to the International Civil Aviation Organization.45 Industry efforts for a global space situational awareness database Group of Governmental Experts (GGE) on Transparency and Confidence Building Measures. Depending on the forum for discussion and in line with the previously mentioned initiatives, the concept of space sustainability is also used interchangeably with the following: (1) space security, which entails access to space and freedom from threats;46 (2) space stability addressing space situational awareness;47 (3) space safety, which is protection from all unreasonable levels of risk (primarily protection of humans or human activities);48 and (4) responsible uses of space.49 These all reflect the two components of space sustainability as described by the founder of Secure World Foundation: “the first is the physical environment, which includes management of space debris, electromagnetic and physical crowding and congestion, and space weather.... The second component is the political environment, and includes promoting stability and preventing conflict between nations.”50 Bearing this in mind and notwithstanding the potential confusion caused by the interchangeability of terms used, at the core of all proposals conceptualizing space sustainability or related concepts are the notions that: (1) space assets are kept safe and secure, and that the assets are not harmed or interfered with; (2) peaceful space activities continue as free from purposeful/intentional or unintentional harmful interference; (3) the space environment is preserved for peaceful uses; and (4) international cooperative efforts are required. These four points are understood to be the current core conditions for and of space sustainability. It must be acknowledged that space sustainability, in this context, is severed from the ecological roots of sustainable development. Rationale for space sustainability The proposed baseline conditions for the current conception for space sustainability coincide with Gallagher’s analysis of the logic for space cooperation as “Space Governance for Global Security” where all space actors seek “to secure the space domain for peaceful use; to protect space assets from all hazards; and to derive maximum value from space for security, economic, civil, and environmental ends.”51 Based on this understanding, the current conception of and rationale for space sustainability ties more clearly to global security than to sustainable development. This logic emphasizes that “the more different countries, companies, and individuals depend on space for a growing array of purposes, the more they need equitable rules, shared decision-making procedures, and effective compliance mechanisms to maximize the benefits that they all can gain from space, while minimizing risks from irresponsible space behaviors or deliberate interference with legitimate space activities.”52 While it is acknowledged that such a need exists, the difficulty in reaching agreement on how to bring it about is one reason why some states are more focused on producing a dialogue on long-term sustainability. This is seen in the proliferation of reports outlining best practices and options that enhance sustainability through increased information sharing, as well as a focus on technical issues rather than on the creation of any new legal regimes. To minimize some of the risks of non-sustainable space use, Weeden53 proposes a three-pillar technical approach to space sustainability: (1) debris mitigation; (2) debris removal; and (3) space traffic management. This is conjoined with an immediate need for data in support of conjunction assessment and collision avoidance. This emphasis on data sharing/collection includes enabling research into potential solutions to the problem of space debris, and enhancing transparency and cooperation among states. Weeden also suggests that this narrow approach to space sustainability serves both to educate space actors about the severity of the space debris problem and to provide stability to reduce the likelihood of conflict. A common approach to data also serves as verification for a potential code of conduct in space, setting the stage for future space governance models. These proposals follow the logic of sustainability for global security. While this logic is in line with the dominant conceptualization of benefit sharing and freedom of outer space, the position taken in this article is that it does not adequately speak to sustainability from the perspective of aspirant space states. To do so requires a significantly broader discussion and solutions aimed towards aligning space law and policy with the sustainable development paradigm, if understood as being an inclusive paradigm and not focused on the individualistic/self-interested nature of the current conception of sustainable development. A systemic, sustainable development law approach calls for a conscious engagement with the web of overlapping social, environmental, cultural, and legal frameworks, as well as cultural considerations, economic policies, expectations, players, and interests.54 Bearing in mind current U.S. space policy,55 such a broad overarching objective may not be achievable as part of the dialogue on the “Long Term Sustainability of Outer Space Activities,” but U.S. policy regarding preservation of the space environment nevertheless offers insights because international initiatives congruent with it are likely to garner the most support. Schrogl56 proposed that sustainability is rendered to threats and risks to satellite operations. This approach acknowledges the intersection of multiple issue areas: environment, security, mobility, knowledge, resources, and energy. This intersection of issue areas is more akin to the wider discourse of sustainability development of and on the Earth, and prompts a discussion of value to emerging and aspirant space actors. Otherwise, the dominant conceptualization of space sustainability removes any focus upon providing for the needs of those not among the most advanced space nations. This problem is highlighted in Peter and Rathgeber’s definition of space sustainability: Sustainable space activities can be seen as activities (in space, from space, through space and towards space) that meet the needs of the present space actors without comprising the ability of future generations to meet their own needs of performing space related operations safely.57 Peter and Rathgeber claim that the emergence of new institutional space actors, particularly from the south, is putting a greater pressure on the space environment and that the participation of the south in space sustainability efforts is unsatisfactory.58 Yet, the role of less-advanced nations in sustainability initiatives is more so on the receiving end in that advanced nations seek to engage newcomers to space during the early phase of the development of future directives and codes of conduct for sustainable space activities; that is, not really to seek their input, but to ensure compliance by the less-advanced nations.59 Their space activities are judged as either threats to or consistent with space sustainability, rather than as part of articulating the content of space sustainability.60 This indicates that, for national space programs of established space nations, a truly international focus on space sustainability is not a priority. It is interesting to note, at this juncture in the discussion, a fundamental provision proposed by a group of developing states during the development of the U.N. Space Benefits Declaration.61 (1) All States should pursue their activities in Outer Space with due regard to the need to preserve Outer Space, in such a way as not to hinder its continued utilization and exploration. (2) States should pay attention to all aspects related to the protection and preservation of the Outer Space environment, especially those potentially affecting the Earth’s environment. (3) States with relevant space capabilities and with programs for the utilization and exploration of outer space should share with developing countries on an equitable basis the scientific and technological knowledge necessary for the proper development of programs oriented to the more rational utilization and exploration of Outer Space.62 Paragraph 3 is fundamental and truly revealing when read in the light of the analysis of Schrogl.63 Schrogl claims that the declaration takes up the problem of space debris, which might endanger future space utilization to a significant extent. However, he also states that “the wish [of the Developing countries] to be informed about debris prevention measures voiced. . . is reasonable but actually needs no mentioning since these technological developments are discussions and documented publicly to the greatest extent.”64

#### The Aff does nothing or its blatantly extra topical – that’s a voting issue for limits and ground since they can tack on infinite different permutations of planks and add ons to the plan to solve for neg ground and das which hurts in depth clash and kills negative engagement since we can never predict all the different planks they can add onto the 1ac

### 2

#### CP Text – [States] should substantially increase their research and deployment of a solar radiation management policy.

* Solar Radiation Management

#### SRM is highly effective and cools to pre-industrial levels incredibly fast – it avoids the Impact Turns since it doesn’t reduce Carbon Emissions

Bickel 13, J. Eric. "Climate engineering and climate tipping-point scenarios." Environment Systems & Decisions 33.1 (2013): 152-167. (PhD in Engineering-Economic Systems @ Stanford University, Associate Professor @ the University of Texas at Austin School of Engineering)//Elmer

SRM differs from air capture in that it seeks to reverse the energy imbalance caused by increased greenhouse gas (GHG) concentrations. This is achieved by reflecting back into space some fraction of the incoming shortwave radiation from the Sun. Calculations show that reflecting one to two percent of the sunlight that strikes the Earth would cool the planet by an amount roughly equal to the warming that is likely from doubling the concentration of GHGs (Lenton and Vaughan 2009). Scattering this amount of sunlight appears to be possible (Novim 2009). SRM holds the possibility of acting on the climate system on a time-scale that could prevent the abrupt and harmful changes discussed above (Novim 2009). In fact, SRM may be the only human action that can cool the planet in an emergency. As Lenton and Vaughan (2009) note, “It would appear that only rapid, repeated, large-scale deployment of potent shortwave geoengineering options (e.g., stratospheric aerosols) could conceivably cool the climate to near its preindustrial state on the 2050 timescale.”

### Case

#### No water wars

* Most water crises don’t cause conflict
* Often results in collaboration through water sharing agreement development
* Main causation for water wars is weak institutional capacity and political and economic dynamics

Gleick 18 [Peter Gleick, MacArthur “Genius” Fellowship and was elected to the U.S. National Academy of Sciences, world-renowned expert, innovator, and communicator on water and climate issues, cofounded the Pacific Institute, which he led as president until mid-2016, pHd from UC Berkeley, and Charles Iceland, s Director, Global and National Water Initiatives with WRI’s Food, Forests, and Water Programs, “Water, Security, & Conflict”, https://pacinst.org/wp-content/uploads/2018/08/Water-Security-and-Conflict\_Aug-2018-2.pdf]

3.2. The Role of Governance in Water Security

Most water crises do not end in conflict, migration, or acute food insecurity. Instead, people muddle through until the crises recede. Some crises even generate cooperation among local or regional parties. Understanding why water crises lead to adverse outcomes in some places and better outcomes in others will help inform strategies for reducing the risks of conflict. Why, for example, did Syria sink into civil war following a record-breaking five-year drought, while .Iordan and Lebanon avoided strife following that same drought (Adams et al. 2018)? This requires integrating analyses of meteorological and resource-related events with the diverse social, political, and economic dynamics at play.

We can postulate—based on research conducted by Wolf and his colleagues (2003) on transboundary basins— that when rapid change, either on the institutional side or in the physical system, outpaces the institutional capacity to absorb that change, the stage is set for possible water insecurity. Therefore, when we go looking for water insecurity, we need to be on the lookout for large-scale water-related change and low capacity to handle such change (this Is what the Water, Peace, and Security [WPS] consortium is attempting to do via the development of a near realtime global early warning system for potential water-related threats to human security—more on this further on in this brief).

#### Adaptation solves

Gleick 18 [Peter Gleick, MacArthur “Genius” Fellowship and was elected to the U.S. National Academy of Sciences, world-renowned expert, innovator, and communicator on water and climate issues, cofounded the Pacific Institute, which he led as president until mid-2016, pHd from UC Berkeley, and Charles Iceland, s Director, Global and National Water Initiatives with WRI’s Food, Forests, and Water Programs, “Water, Security, & Conflict”, https://pacinst.org/wp-content/uploads/2018/08/Water-Security-and-Conflict\_Aug-2018-2.pdf]

Although water risks are growing worldwide, there are many risk-reducing options available to decision-makers. Some of these options include imposing water demand caps in water-stressed regions; replacing water-inefficient irrigation schemes with more efficient irrigation technologies (irrigation accounts for 70 percent of water withdrawals worldwide); planting water-efficient and drought-resistant crops; introducing social safety net programs; reducing global food loss and waste; reducing population growth rates; implementing urban water conservation measures; investing in wastewater treatment and reuse technologies; engaging in negotiation of watershed agreements; improving water data and information systems; investing in dams, dikes, and levees; protecting and restoring natural capital, including forests and wetlands; and helping countries strengthen their governance systems.

#### No Extinction from Warming – new studies prove over-hype and tech solves.

* Extinction Tipping Point is implausible – we’re on track for 3 degrees, not 4-5 degrees
* Tech and Energy Modernization Solve – Renewable Energy is replacing Fossil Fuels which reduces Climate Mortality by a rate of 5.

Nordhaus 20 Ted Nordhaus 1-23-2020 “Ignore the Fake Climate Debate” <https://www.wsj.com/articles/ignore-the-fake-climate-debate-11579795816>, found by BPS, (American author, environmental policy expert, and the director of research at The Breakthrough Institute, citing new climate change forecasts)//Re-cut by Elmer

Beyond the headlines and social media, where Greta Thunberg, Donald Trump and the online armies of climate “alarmists” and “deniers” do battle, there is a real climate debate bubbling along in scientific journals, conferences and, occasionally, even in the halls of Congress. It gets a lot less attention than the boisterous and fake debate that dominates our public discourse, but it is much more relevant to how the world might actually address the problem. In the real climate debate, no one denies the relationship between human emissions of greenhouse gases and a warming climate. Instead, the disagreement comes down to different views of climate risk in the face of multiple, cascading uncertainties. On one side of the debate are optimists, who believe that, with improving technology and greater affluence, our societies will prove quite adaptable to a changing climate. On the other side are pessimists, who are more concerned about the risks associated with rapid, large-scale and poorly understood transformations of the climate system. But most pessimists do not believe that runaway climate change or a hothouse earth are plausible scenarios, much less that human extinction is imminent. And most optimists recognize a need for policies to address climate change, even if they don’t support the radical measures that Ms. Thunberg and others have demanded. In the fake climate debate, both sides agree that economic growth and reduced emissions vary inversely; it’s a zero-sum game. In the real debate, the relationship is much more complicated. Long-term economic growth is associated with both rising per capita energy consumption and slower population growth. For this reason, as the world continues to get richer, higher per capita energy consumption is likely to be offset by a lower population. A richer world will also likely be more technologically advanced, which means that energy consumption should be less carbon-intensive than it would be in a poorer, less technologically advanced future. In fact, a number of the high-emissions scenarios produced by the United Nations Intergovernmental Panel on Climate Change involve futures in which the world is relatively poor and populous and less technologically advanced. Affluent, developed societies are also much better equipped to respond to climate extremes and natural disasters. That’s why natural disasters kill and displace many more people in poor societies than in rich ones. It’s not just seawalls and flood channels that make us resilient; it’s air conditioning and refrigeration, modern transportation and communications networks, early warning systems, first responders and public health bureaucracies. New research published in the journal Global Environmental Change finds that global economic growth over the last decade has reduced climate mortality by a factor of five, with the **greatest benefits documented in the poorest nations.** In low-lying Bangladesh, 300,000 people died in Cyclone Bhola in 1970, when 80% of the population lived in extreme poverty. In 2019, with less than 20% of the population living in extreme poverty, Cyclone Fani killed just five people. “Poor nations are most vulnerable to a changing climate. The fastest way to reduce that vulnerability is through economic development.” So while it is true that poor nations are most vulnerable to a changing climate, it is also true that the fastest way to reduce that vulnerability is through economic development, which requires infrastructure and industrialization. Those activities, in turn, require cement, steel, process heat and chemical inputs, all of which are impossible to produce today without fossil fuels. For this and other reasons, the world is unlikely to cut emissions fast enough to stabilize global temperatures at less than 2 degrees above pre-industrial levels, the long-standing international target, much less 1.5 degrees, as many activists now demand. But recent forecasts also suggest that many of the worst-case climate scenarios produced in the last decade, which assumed unbounded economic growth and fossil-fuel development, are also very unlikely. There is still substantial uncertainty about how sensitive global temperatures will be to higher emissions over the long-term. But the best estimates now suggest that the world is on track for 3 degrees of warming by the end of this century, not 4 or 5 degrees as was once feared. That is due in part to slower economic growth in the wake of the global financial crisis, but also to decades of technology policy and energy-modernization efforts. “We have better and cleaner technologies available today because policy-makers in the U.S. and elsewhere set out to develop those technologies.” The energy intensity of the global economy continues to fall. Lower-carbon natural gas **has** displaced coal **as the primary source of new fossil energy**. The falling cost of wind and solar energy has begun to have an effect on the growth of fossil fuels. Even nuclear energy has made a modest comeback in Asia.

#### [Aff] studies about CO2 impact are exaggerated

* peer-reviewed journal shows IPCC exaggeration
* history proves resilience
* no extinction- warming under Paris goals
* rock breaking strategy could offset warming

IBD 18 Investors Business Daily 4-25-2018 “Here's One Global Warming Study Nobody Wants You To See” <https://www.investors.com/politics/editorials/global-warming-computer-models-co2-emissions/> (Citing Study from Peer reviewed journal by Lewis and Curry)//Re-cut by Elmer

Settled Science: A new study published in a peer-reviewed journal finds that climate models exaggerate the global **warming from CO2** emissions by as much as 45%. If these findings hold true, it's huge news. No wonder the mainstream press is ignoring it. In the study, authors Nic Lewis and Judith Curry looked at actual temperature records and compared them with climate change computer models. What they found is that the planet has shown itself to be far less sensitive to increases in CO2 than the climate models say. As a result, they say, the planet will warm less than the models predict, even if we continue pumping CO2 into the atmosphere. As Lewis explains: "Our results imply that, for any future emissions scenario, future warming is likely to be substantially lower than the central computer model-simulated level projected by the (United Nations Intergovernmental Panel on Climate Change), and highly unlikely to exceed that level. How much lower? Lewis and Curry say that their findings show temperature increases will be 30%-45% lower than the climate models say. If they are right, then there's little to worry about, even if we don't drastically reduce CO2 emissions. The planet will warm from human activity, but not nearly enough to cause the sort of end-of-the-world calamities we keep hearing about. In fact, the resulting warming would be below the target set at the Paris agreement. This would be tremendously good news. The fact that the Lewis and Curry study appears in the peer-reviewed American Meteorological Society's Journal of Climate lends credibility to their findings. This is the same journal, after all, that recently published widely covered studies saying the Sahara has been growing and the climate boundary in central U.S. has shifted 140 miles to the east because of global warming. The Lewis and Curry findings come after another study, published in the prestigious journal Nature, that found the long-held view that a doubling of CO2 would boost global temperatures as much as 4.5 degrees Celsius was wrong**.** The most temperatures would likely climb is 3.4 degrees. It also follows a study published in Science, which found that **rocks** contain vast amounts of nitrogen that plants could use to grow and absorb more CO2, potentially **offsetting** at least some of the effects of CO2 emissions and reducing future temperature increases.

#### Variations natural and CO2 effects are overstated.

* 10,000 years prove natural range of warming
* No Co2 effect on Warming – No Net Warming despite 8 Percent increase of Co2
* Solar Radiation has net greater effect – close correlation over past 150 years

Carter et al. 15 Robert M Carter 4-12-2015 “Why Scientists Disagree About Global Warming The NIPCC Report on Scientific Consensus” (Craig D. Idso, Ph.D. Robert M. Carter, Ph.D. S. Fred Singer, Ph. D. Chairman Emeritus Fellow Chairman Center for the Study Institute of Public Affairs Science and of Carbon Dioxide Australia) Environmental Policy and Global Change Project (USA) (USA))//Elmer

Modern Warming Is Not Unprecedented IPCC’s second false postulate is that the late twentieth century warm peak was of greater magnitude than previous natural peaks. Comparison of modern and ancient rates of natural temperature change is difficult because of the lack of direct measurements available prior to 1850. However, high-quality proxy temperature records from the Greenland ice core for the past 10,000 years demonstrate a natural range of warming and cooling rates between +2.5 and -2.5 °C/century (Alley, 2000; Carter, 2010, p. 46, figure7), significantly greater than rates measured for Greenland or the globe during the twentieth century. Glaciological and recent geological records contain numerous examples of ancient temperatures up to 3°C or more warmer than the peak reported at the end of the twentieth century. During the Holocene, such warmer peaks included the Egyptian, Minoan, Roman, and Medieval warm periods (Alley, 2000). During the Pleistocene, warmer peaks were associated with interglacial oxygen isotope stages 5, 9, 11, and 31 (Lisiecki and Raymo, 2005). During the Late Miocene and Early Pliocene (6–3 million years ago) temperature consistently attained values 2–3°C above twentieth century values (Zachos et al., 2001). Figure 10 summarizes these and other findings about surface temperatures that appear in Chapter 4 of Climate Change Reconsidered-II: Physical Science. Figure 10 Key Facts about Surface Temperature # Whether today’s global surface temperature is seen to be part of a warming trend depends upon the time period considered. # Over (climatic) time scales of many thousand years, temperature is cooling; over the historical (meteorological) time scale of the past century temperature has warmed. Over the past 18 years, there has been no net warming despite an increase in atmospheric CO2 of 8 percent – which represents 34 percent of all human-related CO2 emissions released to the atmosphere since the industrial revolution. # Given an atmospheric mixing time of ~1 year, the facts just related represent a test of the dangerous warming hypothesis, which test it fails. # Based upon the HadCRUT dataset favored by IPCC, two phases of warming occurred during the twentieth century, between 1910–1940 and 1979–2000, at similar rates of a little over 1.5°C/century. The early twentieth century warming preceded major industrial carbon dioxide emissions and must be natural; warming during the second (prima facie, similar) period might incorporate a small human-related carbon dioxide effect, but warming might also be inflated by urban heat island effects. # Other temperature datasets fail to record the late twentieth century warming seen in the HadCRUT dataset. # There was nothing unusual about either the magnitude or rate of the late twentieth century warming pulses represented on the HadCRUT record, both falling well within the envelope of known, previous natural variations. # No empirical evidence exists to support the assertion that a planetary warming of 2°C would be net ecologically or economically damaging. Source: “Chapter 4. Observations: Temperatures,” Climate Change Reconsidered II: Physical Science (Chicago, IL: The Heartland Institute, 2013). CO2 Does Not Lead Temperature IPCC’s third false postulate is that increases in atmospheric CO2 precede, and then force, parallel increases in temperature. The remarkable (and at first blush, synchronous) parallelism that exists between rhythmic fluctuations in ancient atmospheric temperature and atmospheric CO2 levels was first detected in polar ice core samples analyzed during the 1970s. From the early 1990s onward, however, higher-resolution sampling has repeatedly shown these historic temperature changes precede the parallel changes in CO2 by several hundred years or more (Mudelsee, 2001; Monnin et al., 2001; Caillon et al., 2003; Siegenthaler et al., 2005). A similar relationship of temperature change leading CO2 change (in this case by several months) also characterizes the much shorter seasonal cyclicity manifest in Hawaiian and other meteorological measurements (Kuo et al., 1990). In such circumstances, changing levels of CO2 cannot be driving changes in temperature, but must either be themselves stimulated by temperature change, or be co-varying with temperature in response to changes in another (at this stage unknown) variable. Solar Influence Is Not Minimal IPCC’s fourth false postulate is that solar forcings are too small to explain twentieth century warming. Having concluded solar forcing alone is inadequate to account for twentieth century warming, IPCC authors infer CO2 must be responsible for the remainder. Nonetheless, observations indicate variations occur in total ocean–atmospheric meridional heat transport and that these variations are driven by changes in solar radiation rooted in the intrinsic variability of the Sun’s magnetic activity (Soon and Legates, 2013). Incoming solar radiation is most often expressed as Total Solar Insolation (TSI), a measure derived from multi-proxy measures of solar activity (Hoyt and Schatten, 1993; extended and re-scaled by Willson, 2011; Scafetta and Willson, 2013). The newest estimates, from satellite-borne ACRIM-3 measurements, indicate TSI ranged between 1360 and 1363 Wm-2 between 1979 and 2011, the variability of ~3 Wm-2 occurring in parallel with the 11-year sunspot cycle. Larger changes in TSI are also known to occur in parallel with climatic change over longer time scales. For instance, Shapiro et al. (2011) estimated the TSI change between the Maunder Minimum and current conditions may have been as large as 6 Wm-2. Temperature records from circum-Arctic regions of the Northern Hemisphere show a close correlation with TSI over the past 150 years, with both measures conforming to the ~60–70 year multidecadal cycle. In contrast, the measured steady rise of CO2 emissions over the same period shows little correlation with the strong multidecadal (and shorter) ups and downs of surface temperature around the world. Finally, IPCC ignores x-ray, ultraviolet, and magnetic flux variation, the latter having particularly important implications for the modulation of galactic cosmic ray influx and low cloud formation (Svensmark, 1998; Kirkby, et al., 2011). Figure 11 summarizes these and other findings about solar forcings from Chapter 3 of Climate Change Reconsidered II: Physical Science.Figure 11 Key Facts about Solar Forcing # Evidence is accruing that changes in Earth’s surface temperature are largely driven by variations in solar activity. Examples of solar-controlled climate change epochs include the Medieval Warm Period, Little Ice Age, and Early Twentieth Century (1910–1940) Warm Period. # The Sun may have contributed as much as 66 percent of the observed twentieth century warming, and perhaps more. # Strong empirical correlations have been reported from around the world between solar variability and climate indices including temperature, precipitation, droughts, floods, streamflow, and monsoons. # IPCC models do not incorporate important solar factors such as fluctuations in magnetic intensity and overestimate the role of human-related CO2 forcing. # IPCC fails to consider the importance of the demonstrated empirical relationship between solar activity, the ingress of galactic cosmic rays, and the formation of low clouds. # The respective importance of the Sun and CO2 in forcing Earth’s climate remains unresolved; current climate models fail to account for a plethora of known Sun-climate connections. # The recently quiet Sun and extrapolation of solar cycle patterns into the future suggest a planetary cooling may occur over the next few decades. Source: “Chapter 3. Solar Forcing of Climate,” Climate Change Reconsidered II: Physical Science (Chicago, IL: The Heartland Institute, 2013). Warming Would Not Be Harmful IPCC’s fifth false postulate is that warming of 2°C above today’s temperature would be harmful. The suggestion that 2°C of warming would be harmful was coined at a conference organized by the British Meteorological Office in 2005 (DEFRA, 2005). The particular value of 2°C is entirely arbitrary and was proposed by the World Wildlife Fund, an environmental advocacy group, as a political expediency rather than as an informed scientific opinion. The target was set in response to concern that politicians would not initiate policy actions to reduce CO2 emissions unless they were given a specific (and low) quantitative temperature target to aim for. Multiple lines of evidence suggest a 2°C rise in temperature would not be harmful to the biosphere. The period termed the Holocene Climatic Optimum (c. 8,000 ybp) was 2–3°C warmer than today (Alley, 2000), and the planet attained similar temperatures for several million years during the Miocene and Pliocene (Zachos et al., 2001). Biodiversity is encouraged by warmer rather than colder temperatures (Idso and Idso, 2009), and higher temperatures and elevated CO2 greatly stimulate the growth of most plants (Idso and Idso, 2011). Despite its widespread adoption by environmental NGOs, lobbyists, and governments, no empirical evidence exists to substantiate the claim that 2°C of warming presents a threat to planetary ecologies or human well-being. Nor can any convincing case be made that a warming will be more economically costly than an equivalent cooling (either of which could occur for natural reasons), since any planetary change of 2°C magnitude in temperature would result in complex local and regional changes, some being of economic or environmental benefit and others being harmful. \* \* \* We conclude neither the rate nor the magnitude of the reported late twentieth century surface warming (1979–2000) lay outside normal natural variability, nor was it in any way unusual compared to earlier episodes in Earth’s climatic history. Furthermore, solar forcings of temperature change are likely more important than is currently recognized, and evidence is lacking that a 2°C increase in temperature (of whatever cause) would be globally harmful.

#### Acidification impact is tiny and outweighed by daily variation in pH

Goklany 15, Indur M. "Carbon dioxide: The good news." Available at SSRN 2674685 (2015). (PhD @ Michigan State, is a science and technology policy analyst for the US Department of the Interior)//Elmer

Increasing carbon dioxide levels in the atmosphere clearly increase the growth rate of land plants, other things being equal. Is the same true for marine photosynthesisers such as algae, phytoplankton and symbiotic zooxanthellae in corals? Carbon dioxide dissolves in seawater and there is good evidence that this causes enhanced growth rates in many taxa. This is despite the fact that dissolved carbon dioxide forms bicarbonate ions, which slightly decrease the pH of the water, leading to what is often inaccurately called ‘ocean acidification’. There is no likelihood of the ocean’s average pH getting anywhere near as low as 7 (neutral) because of elevated carbon dioxide concentrations during the next three centuries. Ocean pH currently averages about 8 and is forecast to fall by 0.2 pH units or so during the present century. This change is considerably smaller than the difference in pH between different parts of the ocean, different days in the same part of the ocean, and even different times of day in coral reef lagoons. An examination of upper-ocean pH for a wide variety of ecosystems ranging from polar to tropical, open-ocean to coastal, kelp forest to coral reefs, indicates that variations in month-long pH spanned a range of 0.024 –1.430 pH units, and found that many organisms ‘are already experiencing pH regimes that are not predicted until 2100.’93 In other words, the projected change in pH is much smaller than the noise in its natural variation. So it is highly speculative that this small longterm trend will bring problems for marine life that are greater than the benefits of extra carbon dioxide for photosynthetic marine organisms and hence the whole marine biosphere.

#### CO2 is key to agriculture – stops extinction

Ferrera 14 Peter Ferrera 2-24-2014 “The Period Of No Global Warming Will Soon Be Longer Than the Period of Actual Global Warming” <http://www.forbes.com/sites/peterferrara/2014/02/24/the-period-of-no-global-warming-will-soon-be-longer-than-the-period-of-actual-global-warming/#42cc9ebf8bf0> (J.D. Harvard Law, contributor to Forbes on climate and public policy, Director of Entitlement and Budget Policy for the Heartland Institute, Senior Advisor for Entitlement Reform and Budget Policy at the National Tax Limitation Foundation, General Counsel for the American Civil Rights Union, and Senior Fellow at the National Center for Policy Analysis, served in the White House Office of Policy Development under President Reagan, and as Associate Deputy Attorney General of the United States under President George H.W. Bush)//Elmer

In addition, CO2 is actually essential to all life on the planet. Plants need CO2 to grow and conduct photosynthesis, which is the natural process that creates food for animals and fish at the bottom of the food chain. The increase of CO2 in the atmosphere that has occurred due to human emissions has actually increased agricultural growth and output as a result, causing actually an increased greening of the planet. So has any warming caused by such human emissions, as minor warming increases agricultural growth. The report states, “CO2 is a vital nutrient used by plants in photosynthesis. Increasing CO2 in the atmosphere ‘greens’ the planet and helps feed the growing human population.”

#### Best studies prove

Ballonoff 14, Paul. "A fresh look at climate change." Cato J. 34 (2014): 113. (consultant, international energy development)//Elmer

While in fact heating has not occurred as the IPCC forecasted, greatly increased global biomass is indeed demonstrated. Well documented evidence shows that concurrently with the increased CO2 levels, extensive, large, and continuing increase in biomass is taking place globally—reducing deserts, turning grasslands to savannas, savannas to forests, and expanding existing forests (Idso 2012). That survey covered 400 peer-reviewed empirical studies, many of which included surveys of dozens to hundreds of sources. Comprehensive study of global and regional relative greening and browning using NOAA data showed that shorter-term trends in specific locations may reflect either greening or browning, and also noted that the rapid pace of greening of the Sahel is due in part to the end of the drought in that region. Nevertheless, in nearly all regions and globally, the overall effect in recent decades is decidedly toward greening (de Jong et al. 2012). This result is also the opposite of what the IPCC expected.

#### Food Shortages case Extinction and outweigh

Cribb 10, Julian. The coming famine. University of California Press, 2010. (principal of JCA, fellow of the Australian Academy of Technological Sciences and Engineering)//Elmer

The character of human conflict has also changed: since the early 1990S, **more wars have been triggered by disputes over food,** land, and water than over mere political or ethnic differences. This should not surprise US: people have fought over the means of survival for most of history. But in the abbreviated reports on the nightly media, and even in the rarefied realms of government policy, the focus is almost invariably on the players—the warring national, ethnic, or religious factions—rather than on the play, the deeper subplots building the tensions that ignite conflict. Caught up in these are groups of ordinary, desperate people fearful that there is no longer sufficient food, land, and water to feed their children—and believing that they must fight ‘the others” to secure them. At the same time, the number of refugees in the world doubled, many of them escaping from conflicts and famines precipitated by food and resource shortages. Governments in troubled regions tottered and fell. The coming famine is **planetary** because it involves both the immediate effects of hunger on directly affected populations in heavily populated regions of the world in the next forty years—and also the impacts of war, government failure, refugee crises, shortages, and food price spikes that will affect all human beings, no matter who they are or where they live. It is an emergency because unless it is solved, **billions will experience great hardship**, and not only in the poorer regions. Mike Murphy, one of the world’s most progressive dairy farmers, with operations in Ireland, New Zealand, and North and South America, succinctly summed it all up: “Global warming gets all the publicity but the real imminent threat to the human race **is starvation** on a massive scale. Taking a 10—30 year view, I believe that food shortages, famine and huge social unrest are probably the greatest threat the human race has ever faced. I believe future food shortages are a far bigger world threat than global warming.”2° The coming famine is also complex, because it is driven not by one or two, or even a half dozen, **factors but rather by the confluence of many large and profoundly intractable causes that tend to amplify one another**. This means that it cannot easily be **remedied by “silver bullets”** **in the form of technology, subsidies, or single-country policy changes**, because of the synergetic character of the things that power it.

#### Deaths from cold outweigh heat.

Ridley 13 (Matt, Climate Journalist. “Why Climate Change is Good for the World” October 19th 2013, <http://www.spectator.co.uk/2013/10/carry-on-warming/)>

Climate change has done more good than harm so far and is likely to continue doing so for most of this century. This is not some barmy, right-wing fantasy; it is the consensus of expert opinion. Yet almost nobody seems to know this. Whenever I make the point in public, I am told by those who are paid to insult anybody who departs from climate alarm that I have got it embarrassingly wrong, don’t know what I am talking about, must be referring to Britain only, rather than the world as a whole, and so forth. At first, I thought this was just their usual bluster. But then I realised that they are genuinely unaware. Good news is no news, which is why the mainstream media largely ignores all studies showing net benefits of climate change. And academics have not exactly been keen to push such analysis forward. So here follows, for possibly the first time in history, an entire article in the national press on the net benefits of climate change. There are many likely effects of climate change: positive and negative, economic and ecological, humanitarian and financial. And **if you aggregate them all, the overall effect is positive today — and likely to stay positive until around 2080**. That was the conclusion of Professor Richard Tol of Sussex University **after he reviewed 14 different studies of the effects of future climate trends**. To be precise, Prof Tol calculated that climate change would be beneficial up to 2.2˚C of warming from 2009 (when he wrote his paper). This means approximately 3˚C from pre-industrial levels, since about 0.8˚C of warming has happened in the last 150 years. The latest estimates of climate sensitivity suggest that such temperatures may not be reached till the end of the century — if at all. The Intergovernmental Panel on Climate Change, whose reports define the consensis, is sticking to older assumptions, however, which would mean net benefits till about 2080. Either way, it’s a long way off. Now Prof Tol has a new paper, published as a chapter in a new book, called *How Much have Global Problems Cost the World?*, which is edited by Bjorn Lomborg, director of the Copenhagen Consensus Centre, and was reviewed by a group of leading economists. In this paper he casts his gaze backwards to the last century. He concludes that climate change did indeed raise human and planetary welfare during the 20th century. You can choose not to believe the studies Prof Tol has collated. Or you can say the net benefit is small (which it is), you can argue that the benefits have accrued more to rich countries than poor countries (which is true) or you can emphasise that after 2080 climate change would probably do net harm to the world (which may also be true). You can even say you do not trust the models involved (though they have proved more reliable than the temperature models). But what you cannot do is deny that this is the current consensus. If you wish to accept the consensus on temperature models, then you should accept the consensus on economic benefit. Overall, Prof Tol finds that **climate change in the past century improved human welfar**e. By how much? He calculates **by 1.4 per** cent of global economic output, rising to 1.5 per cent by 2025. For some people, this means the **difference between survival and starvation**. It will still be 1.2 per cent around 2050 and will not turn negative until around 2080. In short, my children will be very old before global warming stops benefiting the world. Note that if the world continues to grow at 3 per cent a year, then the average person will be about nine times as rich in 2080 as she is today. So low-lying Bangladesh will be able to afford the same kind of flood defences that the Dutch have today. The chief benefits of global warming include: **fewer winter deaths**; **lower energy costs**; **better ag**ricultural yields; probably **fewer droughts**; maybe **richer biodiversity**. It is a little-known fact that winter deaths exceed summer deaths — not just in countries like Britain but also those with very warm summers, including Greece. Both Britain and Greece see mortality rates rise by 18 per cent each winter. Especially cold winters cause a rise in heart failures far greater than the rise in deaths during heatwaves. **Cold, not the heat, is the biggest killer**. For the last decade, Brits have been dying from the cold at the average rate of 29,000 excess deaths each winter. Compare this to the heatwave ten years ago, which claimed 15,000 lives in France and just 2,000 in Britain. In the ten years since, there has been no summer death spike at all. Excess winter deaths hit the poor harder than the rich for the obvious reason: they cannot afford heating. And it is not just those at risk who benefit from moderate warming. Global warming has so far cut heating bills more than it has raised cooling bills. If it resumes after its current 17-year hiatus, and if the energy efficiency of our homes improves, then at some point the cost of cooling probably will exceed the cost of heating — probably from about 2035, Prof Tol estimates. The greatest benefit from climate change comes not from temperature change but from carbon dioxide itself. It is not pollution, but the raw material from which plants make carbohydrates and thence proteins and fats. As it is an extremely rare trace gas in the air — less than 0.04 per cent of the air on average — plants struggle to absorb enough of it. On a windless, sunny day, a field of corn can suck half the carbon dioxide out of the air. Commercial greenhouse operators therefore pump carbon dioxide into their greenhouses to raise plant growth rates. The increase in average carbon dioxide levels over the past century, from 0.03 per cent to 0.04 per cent of the air, has had a measurable impact on plant growth rates. It is responsible for a startling change in the amount of greenery on the planet. As Dr Ranga Myneni of Boston University has documented, using three decades of satellite data, 31 per cent of the global vegetated area of the planet has become greener and just 3 per cent has become less green. This translates into a 14 per cent increase in productivity of ecosystems and has been observed in all vegetation types. Dr Randall Donohue and colleagues of the CSIRO Land and Water department in Australia also analysed satellite data and found greening to be clearly attributable in part to the carbon dioxide fertilisation effect. Greening is especially pronounced in dry areas like the Sahel region of Africa, where satellites show a big increase in green vegetation since the 1970s. It is often argued that global warming will hurt the world’s poorest hardest. What is seldom heard is that the decline of famines in the Sahel in recent years is partly due to more rainfall caused by moderate warming and partly due to more carbon dioxide itself: more greenery for goats to eat means more greenery left over for gazelles, so entire ecosystems have benefited. Even polar bears are thriving so far, though this is mainly because of the cessation of hunting. None the less, it’s worth noting that the three years with the lowest polar bear cub survival in the western Hudson Bay (1974, 1984 and 1992) were the years when the sea ice was too thick for ringed seals to appear in good numbers in spring. Bears need broken ice. Well yes, you may argue, but what about all the weather disasters caused by climate change? Entirely mythical — so far. The latest IPCC report is admirably frank about this, reporting ‘no significant observed trends in global tropical cyclone frequency over the past century … lack of evidence and thus low confidence regarding the sign of trend in the magnitude and/or frequency offloads on a global scale … low confidence in observed trends in small-scale severe weather phenomena such as hail and thunderstorms’. In fact, the death rate from droughts, floods and storms has dropped by 98 per cent since the 1920s, according to a careful study by the independent scholar Indur Goklany. Not because weather has become less dangerous but because people have gained better protection as they got richer: witness the remarkable success of cyclone warnings in India last week. That’s the thing about climate change — we will probably pocket the benefits and mitigate at least some of the harm by adapting. For example, experts now agree that malaria will continue its rapid worldwide decline whatever the climate does. Yet cherry-picking the bad news remains rife. A remarkable example of this was the IPCC’s last report in 2007, which said that global warming would cause ‘hundreds of millions of people [to be] exposed to increased water stress’ under four different scenarios of future warming. It cited a study, which had also counted numbers of people at reduced risk of water stress — and in each case that number was higher. The IPCC simply omitted the positive numbers. Why does this matter? Even if climate change does produce slightly more welfare for the next 70 years, why take the risk that it will do great harm thereafter? There is one obvious reason: climate policy is already doing harm. Building wind turbines, growing biofuels and substituting wood for coal in power stations — all policies designed explicitly to fight climate change — have had negligible effects on carbon dioxide emissions. But they have driven people into fuel poverty, made industries uncompetitive, driven up food prices, accelerated the destruction of forests, killed rare birds of prey, and divided communities. To name just some of the effects. Mr Goklany estimates that globally nearly 200,000 people are dying every year, because we are turning 5 per cent of the world’s grain crop into motor fuel instead of food: that pushes people into malnutrition and death. In this country, 65 people a day are dying **because they cannot afford to heat their homes properly**, according to Christine Liddell of the University of Ulster, yet the government is planning to double the cost of electricity to consumers by 2030. As Bjorn Lomborg has pointed out, the European Union will pay £165 billion for its current climate policies each and every year for the next 87 years. Britain’s climate policies — subsidising windmills, wood-burners, anaerobic digesters, electric vehicles and all the rest — is due to cost us £1.8 trillion over the course of this century. In exchange for that Brobdingnagian sum, we hope to lower the air temperature by about 0.005˚C — which will be undetectable by normal thermometers. The accepted consensus among economists is that every £100 spent fighting climate change brings £3 of benefit. So we are doing real harm now to impede a change that will produce net benefits for 70 years. That’s like having radiotherapy because you are feeling too well. I just don’t share the certainty of so many in the green establishment that it’s worth it. It may be, but it may not.

#### Ag Solves – Plants act as carbon sinks which offsets Warming

Harris and Gibbs 21 Nancy Harris and David Gibbs 1-21-2021 "Forests Absorb Twice As Much Carbon As They Emit Each Year" <https://www.wri.org/insights/forests-absorb-twice-much-carbon-they-emit-each-year> (Nancy is Research Manager for Global Forest Watch (GFW) within the Food, Forests and Water program. GFW is an international initiative originated by WRI to provide improved data and information about the world’s forests by merging the latest technology with on-the-ground partnerships. Nancy works to identify thematic and geographic research priorities for GFW and leads the acquisition and generation of new data and analytical content. She also supports in-country capacity building efforts and collaborates with GFW staff and partners to produce and communicate original, policy-relevant research that further advances global understanding of critical drivers and dynamics of forest change. Prior to joining WRI, Nancy worked as a Carbon and Land Use Specialist in the Ecosystem Services unit of Winrock International, where she managed Winrock’s spatial analysis team, published several peer-reviewed papers on forest carbon cycling and spatial modeling of land cover change, and provided technical guidance to multiple stakeholders on climate change mitigation options in the land sector.)//Elmer

The world is getting a better understanding of just how important forests are in the global **fight against climate change**. New research, published in Nature Climate Change and available on Global Forest Watch, found that the world’s forests **sequestered** about **twice as much carbon** dioxide **as they emitted** between 2001 and 2019. In other words, forests provide a “carbon sink” that absorbs a net **7.6 billion metric tonnes** of CO2 per year, **1.5 times more carbon than the United States** emits annually. Before now, scientists estimated these global “carbon fluxes” from the sum of country-reported data, creating a coarse picture of the role forests play in both carbon emissions and sequestration. With these new data that combine ground measurements with satellite observations, we can now quantify carbon fluxes consistently over any area, from small local forests to countries to entire continents. Using this more granular information, we found that the world’s forests emitted an average of 8.1 billion metric tonnes of carbon dioxide into the atmosphere each year due to deforestation and other disturbances, and absorbed 16 billion metric tonnes of CO2 per year. Here’s a look at what else the new maps tell us about forests and carbon: Only One Major Tropical Rainforest Remains a Strong Carbon Sink Tropical rainforests are far and away the most important ecosystems for mitigating climate change. Tropical rainforests collectively sequester more carbon from the atmosphere than temperate or boreal forests, but they’re also increasingly destroyed for agricultural expansion. The world’s three largest tropical rainforests are located in the Amazon, Congo River basin and Southeast Asia. Over the past 20 years, forests across Southeast Asia have collectively become a net source of carbon emissions due to clearing for plantations, uncontrolled fires and drainage of peat soils. The Amazon River basin, which stretches across nine countries in South America, is still a net carbon sink, but teeters on the edge of becoming a net source if forest loss continues at current rates. The Amazon basin has experienced heightened deforestation in the last four years due to clearing for cattle pasture and degradation from fires. Of the world’s three largest tropical rainforests, only the Congo has enough standing forest left to remain a strong net carbon sink. The Congo’s tropical rainforest **sequesters 600 million metric tonnes** more carbon dioxide per year than it emits, equivalent to about one-third of the CO2 emissions from all U.S. transportation. Protecting the remaining forests in all three regions **is critical to mitigating climate change**.

#### Melting Arctic ice is key to Russian Oil – their reserves are running dry and the Arctic is the cure

Daiss 16 Daiss, Tim. I'm an oil markets analyst, journalist and author that has been working out of the Asia-Pacific region for 11 years. I’ve covered oil and energy markets and energy security for Platts, Interfax, NewsBase, Downstream Today, Rigzone, and Energy Tribune as well as providing energy markets analysis for subscription newsletters. "Russia Kicks Up Arctic Oil Drilling As Polar Ice Caps Melt." Forbes, 24 Aug. 2016, www.forbes.com/sites/timdaiss/2016/08/22/a-deal-with-the-devil-russia-kicks-up-arctic-oil-drilling/#bc76133381e6.

Russian oil company Gazprom Neft, the country’s fourth largest oil producer, said two weeks ago that four wells were now in production at the northern Prirazlomnoye field after two more were successfully started. The Prirazlomnoye field is an Arctic offshore oilfield located in the Pechora Sea, south of Novaya Zemlya, Russia. Production from an ice-resistant offshore rig perched in the Pechora passed 43,980 barrels of oil per day (bpd), the company said. Full field development plans call for 32 wells. In March, the company said that it had reached a milestone with production of its 10 millionth barrel of oil at the field, while it revised its production schedule higher to 35 million barrels. Russia needs Arctic oil Russian President Vladimir Putin also opened the Arctic gate marine oil terminal on May 25, which provides access for Russia’s Arctic-sourced crude to both European and Asian markets. Russia’s Arctic development comes as its oil production increases despite a more than two-year long supply glut and plunge in prices. But it also comes as the country’s oil fields mature. In April, Mikå Mered, managing partner at Polarisk, a consultancy specializing in polar issues said that Russia’s onshore oil and gas fields “are depleting and depleting fast.” “If you are the Russian government today and if you want to keep having your oil and gas, you need to start developing offshore Arctic oil and gas fast," he said. The Wilson Center, a Washington-based independent research group, said in a recent report on Arctic drilling that Russia needs these new fields if it is going to maintain oil production levels of at least 10 million bpd by 2020 and beyond. Russia is the world's largest producer of crude oil (including lease condensate) and the second-largest producer of dry natural gas after the U.S., according to the U.S. Energy Information Administration’s (EIA) most recent analysis of Russia’s energy sector. The quandary for Russia, however, as I pointed out in a Forbes post this weekend are Western sanctions. Both U.S. and EU sanctions over Moscow's 2014 annexation of Crimea have also hit the country's ability to finance new energy projects and obtain offshore Arctic and shale (fracking) technology. The EIA said that without such Western involvement and technology, new Arctic resources are unlikely to be developed. “Although this has little immediate effect on Russian production, the sanctions, along with the low world oil prices, have made it more difficult for Russian energy companies to finance new projects,” the EIA report adds. Low oil prices, off from $107 per barrel in July 2014 to now trading in the mid to upper $40s range, forced Russia to cancel as much as 80% of new Arctic projects last year, according to a report by Politico.eu. Russia’s Natural Resources Minister Sergey Donskoy, however, has a different take. In March, he said that as much as 75% of these projects were still moving forward. Melting ice caps Arctic oil drilling has environmentalists scrambling and with good reason. The environmental consequences of a spill would be difficult to control and could have devastating effects on local ecosystems, according to numerous environmental groups. Greenpeace has mounted a multi-media campaign, warning the public of the dangers of Arctic drilling. The environmental group has produced a short (one and a half minute) but poignant video clip, beginning with a cartoon polar bear adrift on a sheet of ice as a British female narrator begins. “The Arctic is melting,” she says, “and as the ice melts the oil companies are moving north.” “They are determined to drill for the same fuels that caused the melting in the first place,” the narrator continues as the video zooms in on the animated bear that by now is scowling as a harsh wind is heard swirling in the background. The video then lists a brief history of accidents and dangers of article drilling, mentioning Shell’s recent unsuccessful offshore drilling attempts in Alaska, a 2011 Gazprom accident and what the narrator calls the dangers of Gazprom’s outdated equipment. The video starts to wrap up with these poignant words: “If we don’t stop them, an Arctic oil spill is inevitable.” Meanwhile, the Greenpeace international website continues the narrative, stating that “Shell is getting increasingly desperate to plunder the Arctic in any way possible. It has recently made a deal with the devil: partnering with Russian oil and gas giant Gazprom to access the Arctic through Russia.” Melting Arctic ice also makes it easier for oil companies to drill for Arctic oil. On Friday, NASA released a video of melting polar ice caps. Record-breaking warm temperatures in the first half of 2016 have primed the Arctic for another summer of low sea ice cover, the video states. Next year, or the year after, the central Arctic would be free from ice, Peter Wadhams, a professor of ocean physics at Cambridge since 2001, said over the weekend. “You will be able to cross over the north pole by ship. There will still be about a million square kilometres of ice in the Arctic in summer but it will be packed into various nooks and crannies along the Northwest Passage and along bits of the Canadian coastline,” he said. Russia, however, is not likely to be deterred in its Arctic oil ambitions – too much money is at stake . As much as half of all state revenue in Russia is derived from oil and gas – though the government cites a much lower figure. A July Bloomberg report said that three northern oil terminals on Russia’s northern coast in the Arctic circle is already exporting as much crude oil as Libya -- and that flow could double in the next five years. The three terminals combined handled a combined 230,000 bpd in the second quarter of 2016, almost doubling from 130,000 barrels as recently as January last year, with projections for that to increase to around 400,000 bpd by 2020 – oil and revenue that Russia will exploit to its fullest. The Arctic is estimated to contain about 90 billion barrels of undiscovered oil, 17 trillion cubic feet of undiscovered gas and 44 billion barrels of natural gas liquids, making up, respectively, 16%, 30% and 26% of the world's individual undiscovered hydrocarbon resources, according to the U.S. Geological Survey (USGS).

#### Lower oil revenue doesn’t cause Russian capitulation – they’ll just intervene militarily which causes escalating crisis

Jaffe and Elass 16 [Amy Myers Jaffe and Jareer Elass, Columbia Journal of International Fails. War and the Oil Price Cycle. January 1, 2016. https://jia.sipa.columbia.edu/war-oil-price-cycle]

While low oil prices have forced Moscow to take draconian economic steps, so far it has not fundamentally produced the desired diplomatic capitulation. As predicted by Robert Blackwill and Meghan O’Sullivan, “… a weaker Russia will not necessarily mean a less challenging Russia…Russia could seek to secure its regional influence in more direct ways –even through the projection of military power.”48 Indeed, U.S. summer diplomatic efforts fizzled quickly by autumn, with Russia changing the facts on the ground through direct Russian military intervention. Russia’s motivations are multifold and certainly include protecting its substantial interests in Syria including its preferred outcome that maintains Syria as an Iranian bulwark against Sunni jihadists.49 Some analysts are suggesting that Moscow is overly optimistic about defeating Syrian opposition groups. Instead, it is suggested that Russia’s previous difficulties during its invasion of Afghanistan may prove instructive, with all Syrian opposition forces still focusing in earnest on the Assad camp, and saving energies against each other for a later day.50 However, it is still not clear as this article went to press whether Russia intends to satisfy the Saudis by participating in peace negotiations, or whether the Russian engagement on behalf of Assad is meant to hold Iran and Moscow in a position to use Syria to assert themselves against the kingdom and restore oil prices. While the outcome in Syria is uncertain, the Russian move clearly complicates the landscape in the region, and leaves open the possibility of escalating violence. Pavel Baev and Jeremy Shapiro of Brookings suggest Russia’s increased intervention may simply be designed to “establish a position of strength from which to bring Moscow back into the center of diplomacy over Syria,”51 but they are skeptical that Russia will be able to manage its participation in the conflict to reach a desired goal. Russia may also have broader goals, including intimidating U.S. allies both in the region and in Europe, to influence oil policy over the longer term, as well as to weaken strategic alliances that could be used against Russia, its national interests or the interests of individuals in the current regime. In recent years, Russia has acted to reassert itself on the world stage both through military means and by tapping energy as a weapon for leverage to enhance its geopolitical status.52

#### But, decline causes worse aggression – it’s NoKo 2.0

Fisher 14 [Max Fisher, Vox. The worse Russia's economy gets, the more dangerous Putin becomes. December 17, 2014. https://www.vox.com/2014/12/17/7401681/russia-putin-ruble]

You might reasonably conclude that the destruction of Russia's economy is great news for the United States of America. After all, won't it humble Vladimir Putin, forcing him to finally back out of his disastrous Ukraine invasion, soften his growing hostility toward Europe and the US, and generally ratchet down the brinksmanship and aggression that have made him so troublesome?

Actually, it's the opposite. The odds are that Russia's freefalling economy will make Putin even more aggressive, more unpredictable, and less willing to compromise. The weaker that Russia becomes, the more dangerous it will get, and that's terrible news for everyone, including the US.

It is precisely because the cratering economy is weakening Putin that it will force him to bolster his rule, which he will almost certainly do by drumming up nationalism, foreign confrontations, and state propaganda. Russia, already hostile and isolated, is likely to become even more so, worsening both its behavior abroad and the already-significant economic suffering of regular Russians. The country's propaganda bubble will further seal off Russians from the outside world, telling them that Russia's decline is the fault of Western aggression that they must rally against.

In all, this effect is starting to look something like the North Koreaification of Russia. That does not mean that Russia is about to become or will ever be as isolated, hostile, or aggressive as North Korea, but it only has to edge a little bit in that direction to bring terrible consequences for the world and for Russians themselves.

**Collapse causes Putin lashout and nuke war**

**Thompson 15** (Loren Thompson-Lexington Institute strategic consultant and Georgetown government PhD , “Why Putin's Russia Is The Biggest Threat To America In 2015”, <http://www.forbes.com/sites/lorenthompson/2015/01/02/why-putins-russia-is-the-biggest-threat-to-america-in-2015/2/> , 1-2-15)

Like the stock market crashes that periodically wipe out so many fortunes, military crises are hard to predict. Washington’s track record as a seer of future threats is remarkably poor. From the bombing of Pearl Harbor in the 1940s to North Korea’s invasion of the South in the 1950s to the Cuban Missile Crisis in the 1960s to the collapse of South Vietnam in the 1970s to the breakup of the Soviet empire in the 1980s to Iraq’s invasion of Kuwait in the 1990s to the 9-11 attacks and rise of ISIS in the new millennium, America’s policy elite never seems to see looming danger until it is too late. So don’t be surprised if the economic sanctions Washington has led the West in imposing on Russia look like a bad idea a year from now. At the moment, a combination of sanctions and plummeting oil prices seems to be dealing the government of President Vladimir Putin a heavy blow — just retribution, many say, for its invasion of Ukraine and annexation of Crimea last year. But as Alan Cullison observed in the Wall Street Journal this week, sanctions sometimes provoke precisely the opposite response from what policymakers hope. In Russia’s case, that could mean a threat to America’s survival. Let’s briefly consider how Russia’s current circumstances could lead to dangers that dwarf the challenges posed by ISIS and cyber attacks. A paranoid political culture. Russia’s moves on Ukraine look to many Westerners like a straightforward case of aggression. That is not the way they look to Vladimir Putin’s inner circle of advisors in Moscow, nor to most Russians. That inner circle is drawn mainly from the Russian security services — Putin himself spent 16 years in the KGB — and to them the revolution in Ukraine was a U.S.-backed coup aimed at weakening Russia. Putin describes the Crimea as a birthplace of Russian culture, and his government has repeatedly warned against the expansion of Western economic and political influence into a region historically regarded as Moscow’s sphere of influence. Putin relies heavily on the Kremlin bureaucracy to provide him with intelligence (he avoids the Internet), so his briefings tend to reinforce the view that Moscow was forced to intervene in Ukraine by Western subversion aimed at undermining his **rule. A nuclear arsenal on hair trigger**. Between the two of them, Russia and America control over 90% of the world’s nuclear weapons. However, Moscow is far more dependent on its nuclear arsenal for security, because it cannot afford to keep up with U.S. investments in new warfighting technology. So Russian military doctrine states that it might be necessary to use nuclear weapons to combat conventional attacks from the West. **Many Russians think that attacks on their country are a real possibility, and that their nuclear deterrent — which consists mainly of silo-based missiles in known locations — might have to be launched quickly to escape a preemptive strike**. Moscow staged a major nuclear exercise during last year’s Ukraine crisis in which it assumed missiles would have to be launched fast on warning of a Western attack. A senior Russian officer has stated that 96% of the strategic rocket force can be launched within minutes. **A collapsing** economy. Much of Putin’s popularity within Russia is traceable to the impressive recovery of the post-Soviet economy on his watch. Since he came to power in 2001, the country’s gross domestic product has grown sixfold, greatly increasing the size and affluence of the Russian middle class. But that growth has been based in large part on the export of oil and gas to neighboring countries at a time when energy prices reached record highs. Now the price of oil has fallen at the same time that economic sanctions are beginning to bite. The ruble lost nearly half its value against the dollar last year, and the economy has begun to shrink. Putin blames sanctions for 25-30% of current economic hardships. Many Westerns believe a prolonged recession would weaken Putin’s support, but **because he can blame outsiders, economic troubles** might actually strengthen his hand and accelerate the trend toward **authoritarian rule. A deep sense of grievance**. Blaming outsiders for domestic troubles has a long pedigree in Russian political tradition, and it feeds into a deep-seated sense that Russia has been deprived of its rightful role in the world by the U.S. and other Western powers. Russia may have little past experience with democracy, but it was a major power for centuries prior to the collapse of communism. Like authoritarian rulers in other nations, Putin has built his political base by appealing to nationalism, fashioning a revisionist view of recent events in which Russia is the victim rather that the author of its own misfortunes. has called the break-up of the Soviet Union a tragedy of epic proportions, and apparently really believes it. **By tapping into a deep vein of resentment in Russian political culture, Putin has created a broad constituency for standing up to outsiders even if it means prolonged economic hardship and the danger of war**. A vulnerable antagonist. Federal Reserve chair Janet Yellen says **America faces little danger from Russia’s current troubles**, but that’s because she thinks in economic terms. In a broader sense, America potentially is in great danger because Putin and his advisors really believe they are the target of a Western plot to weaken their country. **The biggest concern is that some new move by Russia along its borders degenerates into a crisis where Moscow thinks it can improve its tactical situation by threatening local use of nuclear weapons, and then the crisis escalates**. At that point U.S. policymakers would have to face the reality that (1) they are unwilling to fight Russia to protect places like Ukraine, and (2) they have no real defenses of the American homeland against a sizable nuclear attack. In other words, the only reason Washington seems to have the upper hand right now is because it assumes leaders in Moscow will act “rationally.” The unspoken wisdom in Washington today is that if nobody gives voice to such fears, then they don’t need to be addressed. That’s how a peaceful world stumbled into the First World War a century ago — by not acknowledging the worst-case potential of a crisis in Eastern Europe — and the blindness of leaders back then explains most of what went wrong later in the 20th Century. If we want to avoid the risk of reliving that multi-generation lesson, then U.S. policymakers need to do something more than simply wait for Putin to crack. That day will never come. In the near term, Washington needs to work harder to defuse tensions, including taking a more serious look at the history that led to Moscow’s move on Crimea. Over the longer term, Washington needs to get beyond its dangerous aversion to building real defenses against long-range nuclear weapons, because it is just a matter of time before some dictator calls America’s bluff.