Icebreakers Case

Affirmative and Negative Case Packet

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Background, Summary, & Strategy

(Do not read this in round- this is meant to help you better understand the case)

What Are Icebreakers?

Icebreakers are specialized ships designed to navigate through ice-covered waters. (It is what it sounds like- they literally break through huge chunks of ice). They play an important role in:

- Opening sea routes by breaking through thick ice.
- Supporting scientific research and military missions.
- Enabling access to remote regions like the Arctic and Antarctic.
- Protecting national interests and conducting search-and-rescue operations.

There are medium and heavy icebreakers, with heavy ones capable of breaking up to 21 feet of ice. Nuclear-powered icebreakers are more powerful and can operate longer without refueling.

Why the Arctic Matters

The Arctic is rapidly changing due to climate change. Melting sea ice is opening up new shipping routes and revealing untapped natural resources such as:

- **Oil and natural gas** (13% of the world's oil and 30% of its natural gas are believed to be in the Arctic).
- **Rare earth minerals** used in electronics and defense technologies.
- **Fisheries** and biodiversity that are crucial to ecological balance.

The Arctic also presents growing geopolitical importance, with increased interest and activity from countries like **Russia** and **China**.

The U.S. Icebreaker Problem

The United States currently operates **only two aging icebreakers**, the *Polar Star* and the *Healy*. In contrast:

- **Russia** has over 40, including nuclear-powered ones.
- **China** is rapidly expanding its presence.
- **Finland** leads in icebreaker design and production.

America hasn't built a new heavy icebreaker in over 25 years, and existing efforts are behind schedule and over budget. This severely limits U.S. access to the Arctic and weakens its ability to compete, defend its interests, and conduct scientific research.

What's the (Case) Debate?

The **Affirmative plan** proposes that the **U.S. federal government should increase its construction and deployment of icebreakers in the Arctic, including nuclear-powered icebreakers**. The debate explores whether this move would:

- Strengthen national security.
- Revitalize American shipbuilding.
- Improve Arctic research.

- Protect the environment and prevent disease spread/ pandemics.
- Secure access to valuable resources.

Key Issues in the Topic

1. **National Security**: A larger fleet helps the U.S. counter Russia and China's growing presence in the Arctic.
2. **Industrial Policy**: Building icebreakers domestically could revitalize the declining U.S. shipbuilding industry (and create more jobs).
3. **Scientific Research**: Icebreakers enable vital climate, disease, and biodiversity research.
4. **Environmental Risks**: Without presence and regulation, Arctic ecosystems could collapse under pressure from overfishing, pollution, and warming.
5. **Global Trade & Resources**: The Arctic could reshape global shipping routes and energy markets.

Core Arguments on Each Side

Affirmative may argue:

- Icebreakers are essential for U.S. geopolitical dominance and resource control.
- Building them domestically boosts jobs and high-tech manufacturing.
- They enable crucial scientific missions and climate monitoring.

Negative may argue:

- Icebreakers are too expensive and money could be better spent elsewhere.
- Arctic militarization could provoke conflict.
- Environmental impacts of increased Arctic activity could be disastrous.

Affirmative Case

Sample 1AC

Inherency

Access to the Arctic is impossible without icebreakers, but America's fleet is small and unreliable, and the US hasn't built a new icebreaker in decades.

Ben **Payton 25**. Freelance journalist focused on responsible investment, natural resources and the energy transition. "Command of the sea: can Trump make America build ships again?." FDI Intelligence. 4-10-2025. https://www.fdiintelligence.com/content/d5c21fa0-b481-4e92-b35e-6b49aeeb6887

The annual 'Operation Deep Freeze' is one of the world's great feats of maritime endeavour. But the Stars and Stripes is a **rare sight** in **icy waters** of the **Arctic** and Antarctic. The **Polar Star** is the **only operational heavy icebreaker** that the United States **Coast Guard possesses**.

"The US has a **very small fleet** of icebreakers, **one heavy** and **two medium**, and they're **old** and really spend a **lot of time in maintenance**," says Cynthia Cook, director of the Defense-Industrial Initiatives Group at the Center for Strategic and International Studies (CSIS). "We have **relatively few — fewer than we need."**

Donald **Trump** agrees. The US president plans to order 48 **icebreakers** to help dramatically **expand** the US **presence** in the increasingly contested **polar regions.** Russia already has world-leading icebreaker capabilities, while China is taking a growing interest in the Arctic and its mineral riches.

But **no American shipyard** has **built** a **heavy icebreaker in decades**. A programme to construct three such vessels, known as Polar Security Cutters, was approved in Mr Trump's first term, but is **years behind schedule** and **significantly over budget**.

This reflects a **much wider malaise** in **American shipbuilding**. The US built 5% of the world's ocean-going commercial ships in the 1970s. Today, the figure is 0.1%. The protectionist Jones Act of 1920, which requires vessels sailing between US ports to be built domestically, has done little to help US shipbuilding remain globally significant.

Last summer, the US signed an agreement called the ICE Pact to buy icebreakers from Canada and Finland. But that effort faces barriers, and even if successful, it won't solve the need for American-made ships.

Ben **Payton 25**. Freelance journalist focused on responsible investment, natural resources and the energy transition. "Command of the sea: can Trump make America build ships again?." FDI Intelligence. 4-10-2025. https://www.fdiintelligence.com/content/d5c21fa0-b481-4e92-b35e-6b49aeeb6887

But as they approach the massive task of **rebuilding** America's maritime strength, **policymakers** face **uncomfortable choices**. Do **they prioritise ships**, or **shipbuilding**? The fastest way to acquire **new vessels** is to **order** from **allied countries** such as **South Korea** and **Japan**, which boast the strongest shipbuilding industries outside China. Investing in domestic shipbuilding, by

contrast, would create **far more jobs** and help **restore** the **country's industrial base**, but would take much **longer** to **accomplish**.

How the administration resolves this dilemma will have drastic implications for global trade and geopolitics.

Breaking the ice

As the US begins the journey towards **reviving its shipbuilding industry**, **icebreakers are top of the to-do list**.

In the icebreaker industry, however, it is not China that occupies top position — but Finland. The Nordic nation's prowess with icebreakers is perhaps not surprising, given that its ports freeze solid each winter. Today, Finland designs 80% of the world's icebreakers and builds more than 60%.

The sudden surge in US interest in icebreakers could therefore provide an enormous boon for Finnish industry.

"I have never seen this level of interest in icebreakers globally," says Mika Hovilainen, CEO of Aker Arctic, a Finnish company that designs and tests icebreakers. It is a time of "dramatic change" in the industry, he explains. Finland's shipyards lost one of their leading customers when it became unacceptable to deliver vessels to Russia after it invaded Ukraine. But demand for icebreakers on the other side of the Atlantic could more than compensate for this loss.

Finland's expertise with icebreakers was one of the arguments used to justify its admission to Nato in 2023. Last July, the US and Canada agreed to establish an Icebreaker Collaboration Effort — known as the **ICE Pact** — with **Finland**, in which the three countries will co-operate in **sharing expertise** and **resources**.

It remains to be seen if Mr **Trump** will **fully support the ICE Pact**. Collaborating with allies may seem to contradict his '**America First' philosophy**. Indeed, in announcing his plan for 48 new US icebreakers in March, the president took a potshot against Canada, a **country** he **hopes to annex**.

"We're going to order 48, and Canada wants to be part of the deal," said Mr Trump. "I say, 'You got to get your own icebreakers. I mean, if you're a state, you can be part of the deal, but if you're a separate country, you've got to get your own icebreakers.'"

Collaboration

Mr Trump has been **more positive** about the **US relationship** with **Finland**, however. In late March, he hosted Finnish president Alexander Stubb for a game of golf, posting on social media afterwards that the US and Finland would work together on the "purchase and development" of icebreakers.

Ordering icebreakers directly from Finland would **require a change to regulations** that require US Navy and Coast Guard **vessels** to be **built domestically**. Finland's ICE Pact coordinator Reko-Antti Suojanen tells fDi Intelligence that a "relaxation" in these regulations is "the only way to come to our common goals."

There is support in the US Congress for reforms that would allow the US to work with allies to speed-up naval construction. Republican senators Mike Lee and John Curtis introduced legislation in February that would allow the US Navy and Coast Guard to order vessels from allied countries, if the cost is cheaper than it would be from a US shipyard.

But these **proposals** will have to **contend with fears** that **closer collaboration could further weaken** the **US shipbuilding industry**.

Meanwhile, Canada and Finland have been working collaboratively since even before the **ICE Pact** was **signed**. Helsinki Shipyard, a world leader in icebreaker construction, was acquired by Canada-based Group Davie in 2023, having previously been under Russian ownership. In March, the Canadian government awarded a C$3.25bn ($2.27bn) heavy icebreaker contract to Davie. Construction will begin at Helsinki Shipyard and be completed at Lévis in Quebec.

The project will be "an excellent showcase of what can be achieved if there is a well-functioning national co-operation in place", says Kim Salmi, managing director of Helsinki Shipyard.

He adds that his company has “unique expertise” in icebreaker construction. “No other shipyard in the world has delivered as many icebreaking vessels as we have.”

“We are also able to build ice-going vessels with the fastest schedule on the market, in 36 months or quicker depending on requirements.”

Plan

Thus, the plan: The United States federal government should increase its construction and deployment of icebreakers in the Arctic, including nuclear-powered icebreakers.

Solvency

The plan solves. Rather than relying on allied ships, the US should construct its own nuclear-powered icebreakers which provide better and more reliable access to the Arctic.

Julia **Nesheiwat &** Andro **Mathewson 22**. *PhD, Distinguished Fellow at the Atlantic Council focused on Arctic policies, energy, and national security; **master’s in international relations from the University of Edinburgh, Capability Support Officer at the HALO Trust. "Securing the north: Expanding the United States’ icebreaker fleet." Military Times. 1-26-2022. https://www.militarytimes.com/opinion/commentary/2022/01/26/securing-the-north-expanding-the-united-states-icebreaker-fleet/

One of the **biggest challenges** facing the United States’ **capability** and capacity to **defend** its **interests** in the far north is the **dearth of icebreakers**. Icebreakers are imperative to the national security of the United States and its Arctic territories. Their importance is also growing due to the continued **melting** of the **polar ice caps**, the encroachment of non-Arctic nations to the region, including China, and heightened tensions over pre-existing territorial disputes and new economic opportunities in the Arctic. However, **despite** their **importance**, the United States’ **fleet** of icebreakers has been **severely neglected**.

Icebreakers are indispensable to the United States for a **multitude** of **reasons**. Not only do they keep trade routes free from winter sea ice and escort shipping vessels safely through ice-covered passages, but they also help supply winter bases, oil rigs, drill sites, and scientific missions with the necessary equipment and cargo year-round. With the retreating northern ice caps, global shipping is increasingly using northern routes for Asia to European trade bypassing the Panama and Suez canal. These shifts can drastically cut shipping times but also allow nations with a significant arctic fleet to hold global trade at risk.

The icebreakers also serve the vitally important role of protecting **energy claims** and **keeping fisheries** from **foreign exploitation**. The U.S. Geological Survey estimates that the Arctic holds over 90 billion barrels of oil and 1,669 trillion cubic feet of gas, the majority of which is commercially viable. Additionally, Arctic fisheries offer a vast, and growing, source of wealth for Arctic nations — the average annual catch value is estimated at over $500 million, another incentive for non-arctic states to encroach on the region. Just last year a massive Chinese fishing fleet encroached on U.S. territorial waters with no regard for international law or sustainable fishing regulations.

Icebreakers often serve as moving research institutions and platforms with teams conducting **scientific research** in the Arctic, including vital **climate change-focused** **research** helping to tackle one of the **region’s largest threats**. The simple presence of icebreakers in the Arctic also sends an important message to potential adversarial nations showcasing the United States’ readiness and willingness to defend its interests in the region.

Despite these growing needs, the U.S. Coast Guard currently **only operates two icebreakers**, the Polar Star (already 10 years over its 30-year life expectancy) and Healy (which suffered an electrical fire in 2020 and was only

recently repaired), both diesel-powered. The only other two U.S.-based icebreakers are privately owned or operated by the University of Alaska.

In comparison, China operates two (and is developing a third), while Russia's armed forces operate at least 46 — including three that are nuclear-powered, extending both their power and durability. These numbers do not take into account those currently under construction or planned, and both nations are investing heavily in expanding their fleets. Russia has also re-militarized a dozen Cold War-era arctic bases to expand its naval presence in the region and to use as berths for its numerous active icebreakers.

NATO allies in the region, such as **Norway and Canada**, also own icebreaker fleets. However, **none of them are nuclear-powered**. Norway's fleet is focused on territorial defense against increasingly aggressive Russian incursions while Canada's fleet is currently comprised of smaller vessels focusing on scientific research and search and rescue efforts. Thus, the U.S. cannot rely on its **Northern** or **European allies** for **defense posturing** in the Arctic. This lack of a substantial U.S. fleet of icebreakers, the absence of **nuclear-powered vessels**, and **reliance** on allied **icebreaker** posturing in the region is a **major flaw** in the US national security strategy and defensive umbrella, which needs to be addressed as **quickly as possible** and is an important strategic investment the United States needs to make immediately.

Currently, the two Coast Guard icebreakers fall under the jurisdiction of the Department of Homeland Security whose budget is anemic compared to the Department of Defense. The Coast Guard does not have the budget to obtain enough icebreakers to **contest Russian** or **Chinese** presence in the Arctic — each heavy icebreaker has an **average cost** of approximately $800 million. While, accumulating the same number of icebreakers as Russia is unnecessary, moving forward all potential solutions to securing America's North requires the purchase of icebreakers, regardless of their status: new or used. Coast Guard Commandant Karl Schultz has stated that "a fleet of nine U.S.-flagged icebreakers" would be sufficient to meet our economic and security needs in the far north.

Thankfully, Congress has already initiated expanding America's arctic security program by authorizing the construction of six new Polar Security Cutters (PSCs), three heavy and three medium icebreakers. However, it is only actively funding the first four.

The next vital step to securing the North is to fully fund and expedite the construction of these six PSCs, especially given the fact that the first PSC is currently planned to be delivered only in late 2024 if it stays on schedule. This is extremely important as expanding the current fleet's missions comes with opportunity costs, thus necessitating a larger fleet to be able to cover all possible icebreaker missions in the region.

Another longer-term option, which can also be done simultaneously to the PSC program, is to increase the available funding for the **Coast Guard**, specifically focused on **Arctic security**, to **establish partnerships** with **private corporations** to **design** and **construct** the United States' first **nuclear-powered icebreaking vessel**. While more expensive, **nuclear icebreakers** come with many benefits over diesel-powered vessels, including both **longevity**, **range**, and **power**, including increasingly vital, **soft power**. With the additional range and longevity of nuclear icebreakers comes a reduced need for the United States to build **expensive** and **difficult** to **maintain arctic bases** — the icebreakers become de facto **mobile bases**. Additionally, the nuclear-powered ships can conduct **longer** and **more missions**, **cementing U.S. positioning in the region**.

A different and swifter approach would involve working with the Department of the Navy to authorize the purchase of an icebreaker under the jurisdiction of the U.S. Navy. This would not only expand the Navy's mission to include patrolling of the far North but could also lead to involving NATO forces in the region. This would also be a welcome step to counteract Russia's recent decision to establish a new Arctic fleet within their navy, acting as a strong signal of America's willingness and readiness to defend its northern territories and those of its allies.

Regardless which option is given the go-ahead, it would also be beneficial to simultaneously encourage the development or purchase of private icebreakers, whether by corporations or public institutions. For example, there is also an existing U.S. icebreaker available for purchase, the Aiviq, currently owned by Edison Chouest Offshore, valued at only $150 million. There are also ships in Finland available for lease that could fill gaps until the PSCs come online. The private purchase and leasing options would maximize the United States' presence in the region.

For the United States to remain economically and militarily competitive **in the Arctic** and maintain its territorial integrity in the region, it requires a substantial fleet of new, **advanced**, and **durable**

icebreakers, as **soon as possible**. The first vital step is to fully fund and expedite the construction of the currently authorized six PSCs. These will enable the United States to continue to secure the freedom of the seas, ensure its national security, and expand economic and academic opportunities to its institutions in the region and beyond.

Icebreakers are key. They give the US a chance to develop a world-class shipbuilding industry it can't find in other sectors.

Rana **Foroohar 25**. American author, business columnist and an associate editor at the Financial Times; also, CNN's global economic analyst. "Will Trump make ships great again?" Financial Times. 3-24-2025. https://archive.ph/msSi8#selection-1712.0-1829.13

The **Biden** administration previously identified **icebreaker ships** as a **promising starting point**, and I would **expect continuity here**. In addition to the geopolitical **importance** of the **Arctic**, it may be easier for the US to compete in markets for **relatively specialised vessels** — such as **icebreakers** — where **price** and **quantity** are not the only factors that buyers typically consider.

Moreover, there are some benefits to starting from **virtually zero**. The need to construct new facilities is an opportunity to **deploy** at scale the most **advanced manufacturing technologies**. It should also be easier to optimise the co-location of new **commercial** and **defence production facilities**, rather than deal with **stranded** legacy **assets**. This presents an **opportunity** to build a **larger manufacturing ecosystem** that includes the **adjacent technologies**, supply chains and applications required for any shipyard to operate effectively.

Ultimately, however, the shipbuilding industry is a game of competitive subsidisation. The major shipbuilding nations provide considerable support to their industries, and Michael Lind has recently shown how the elimination of subsidies under the Reagan administration resulted in the precipitous decline of US shipyards despite the Jones Act.

With that in mind, US policymakers will need to **consider** more **robust forms of investment support**, in addition to the **measures already announced** by the Trump **administration**. Both **shipyards** and the vessels they produce provide ample opportunities for creative public-private financing structures as well as **procurement** and **contracting mechanisms**. America has somehow managed to financially engineer seemingly everything except **critical national security supply chains** and **technologies**; **shipbuilding** offers a **chance to rectify that**.

Advantage 1: Military Power

Robust shipbuilding is necessary for naval dominance.

George F. **Will 23**. PhD in Political Science from Princeton University, winner of Pulitzer Prize for Commentary. "Opinion | Complacency and neglect weaken the Navy amid growing threats." https://www.washingtonpost.com/opinions/2023/10/27/neglected-navy-needs-urgent-rebuilding/.

Sen. Roger Wicker (R-Miss.), ranking member of the Armed Services Committee, wants you to be as alarmed as he is about this: If deterrence, which failed regarding **Ukraine**, fails regarding **Taiwan**, this might be because adversaries understand that U.S. leaders have allowed the nation's **defense industrial base** to become **shockingly short** of **capacities** commensurate with the world's multiplying threats. The U.S. Navy — the nation's **principal means of power projection**; the answer to the "**tyranny of distance**" in the Indo-Pacific — is Wicker's foremost concern. Production of stealthy, lethal **attack submarines**, which Wicker calls "the **crown jewels** of U.S. military power," should, he says, **be doubled**. The Navy has only 49, and Wicker says nearly 40 percent cannot be deployed because of

maintenance delays. So, crews endure grueling operation tempos. Retention falls. Just to fulfill the 2021 AUKUS (Australia, United Kingdom, United States) commitment without reducing the U.S. supply of attack submarines, U.S. production would have to be 2.3 to 2.5 submarines a year. Since before the AUKUS agreement, Congress has been providing funds for two a year, but **only 1.2 are being built**. Today's total U.S. fleet is not quite 300 ships. The fleet has generally been under that number for 20 years. A 355-ship fleet, the goal set at the end of the Obama administration, is a statutory aspiration, but would be 100 too few. A just-published study by Jerry Hendrix, a retired Navy captain now with the Sagamore Institute, notes that although a Biden administration document endorses 381 ships, the Navy's shipbuilding budget is consistently **much too low** to meet proclaimed goals. A ship's life is about 30 years. More than half the Navy's battle force has been in the water for more than 20 years. This, Hendrix writes, "drives dramatically increased costs to maintain the fleet in good repair. Thus, **despite increased budgets**, maintenance has **crowded out money** for **new construction**." Shipbuilding facilities sufficient to fulfill the aspirations do not exist and cannot be quickly created. China, Wicker says, has more productive capacity in one shipyard than exists in all U.S. shipyards combined. Such is the U.S. maintenance backlog, **one attack submarine was idled for five years**. Another, after a 2021 accident in the South China Sea, probably will not be operational until 2026. Writing in the Wall Street Journal, Wicker and former senator Phil Gramm (Tex.) note: "Like David's smooth stone that slew Goliath, two Ukrainian Neptune missiles sank the flagship of the Russian navy in the Black Sea. With 400 U.S. Harpoon missiles, costing only 0.3 percent of its GDP, Taiwan could imperil any Chinese warship in the Taiwan Strait." But munitions inventories are **radically inadequate** to sustain **high-intensity warfighting**. The U.S. military is experiencing the worst recruiting shortfall in 50 years. Wicker thinks this is related to "the injection of hyperpolitical culture into our fighting forces." Imagine what the Chinese military thinks when a Navy secretary says climate change is as important a challenge as recruiting. (The Navy missed this year's recruiting goal by 7,000 sailors.) The word "climate" appeared 63 times in the Biden administration's 48-page 2022 National Security Strategy. The military's alarming material deficits are perhaps matched by intellectual ones. President Xi Jinping has reportedly directed China's military to be able to attack, blockade or otherwise subdue Taiwan by 2027. Unless the defense industrial base is **urgently enlarged**, America's military will be, as some policy experts have observed, like a great football team that can play only through the first quarter. Hence, Wicker's conclusion: "We are in our **most dangerous security moment** since World War II." Winston Churchill wrote that early in 1942, "the foundation of all our hopes and schemes was the **immense shipbuilding programme** of the United States." "Immense" is no longer applicable. The ubiquity of wars throughout history, and the menacing nature of this moment, strongly suggest that we are living in what historians will describe as yet another span of "interwar years." History will not kindly judge national leaders who, while complacently producing $2 trillion annual budget deficits, were parsimonious regarding the preparations for war that are necessary, if not always sufficient, for preventing war.

Naval dominance prevents global conflict escalation in Europe, Asia, and the Middle East.

Seth **Cropsey 22**. Senior fellow and director of the Center for American Seapower, Hudson Institute. "Global Naval War." https://www.realcleardefense.com/articles/2022/12/15/global_naval_war_870332.html

Because this conflict is Eurasian, it is also naval. Its **greatest flashpoints** are **enclosed maritime spaces**, commercial and **strategic nexus points** in the Eurasian littorals – the Black Sea and Eastern Mediterranean, Strait of Hormuz, and Bab-el-Mandeb, and **S**outh and **E**ast **C**hina **S**eas are all **crucial chokepoints** for **global commerce**. The contest for supremacy may have landward elements, but it is **essentially naval** in character. This is **readily apparent** in Asia, where the CCP's PLA has expanded its capabilities for the **express purpose** of an assault on Taiwan and **concurrent naval war** with the **U**nited **S**tates and its allies. It is marginally less apparent in Europe, where Russia wages a ground war in Ukraine. Even in Ukraine, however, Russia's objectives have been maritime in nature, if not in character. Russia seeks to conquer a country that, if added to its productive power, would give the Kremlin a stranglehold over the global wheat, corn, barley, and fertilizer supply. Ukraine added to the Kremlin's domain would also provide it with an ideal base from which to dominate the Mediterranean, play a decisive role in the Middle East, and regulate the Suez chokepoint. Thus, even a power so decidedly

continental as Russia still employs a maritime strategy. The United States can, in the abstract, encounter each threat individually. Yet the issue is twofold. First, these threats are likely to come in sequence. This may be intentional: a coordinated trans-Eurasian campaign is possible. Indeed, the issue of force coordinated is largely overrated. China and Russia need not fight alongside each other in the same battlespace apart from if Russia deploys its submarines to support China in the Western Pacific. Hence the question is not of operational coordination or even theater strategic coordination, but very general coordination at the political level. It may also be opportunistic at a lower level. Major power war will be foreseeable in an operational context: it is hard to move masses of men and materiel to readiness without detection. But smaller probing actions are more difficult to anticipate. Minor revisionist powers, Iran for example, may take advantage of American distraction and use limited capabilities to stress the U.S.' strategic position. Larger powers may employ opportunistic pressure. Second, these threats can be deterred only by a **comprehensive military** prepared for **large-scale war**. The U.S. military is not prepared for this. It lacks the stockpiles, manpower, or industrial base to sustain a major confrontation. Ukraine would burn through American annual 155-millimeter shell production in two weeks, and annual American Anti-Tank Guided Missile production in two months. Unmanned Aircraft System platforms in Ukraine last three or so missions and are destroyed at 90 percent. War is massively expensive and requires a massive amount of equipment. This is true on land and at sea. Platforms themselves are irrelevant if they cannot be sustained in combat. And the U.S., with its atrophied industrial base, will struggle to expand production within the next two to five years. There is a **significant danger** that the U.S.' allies identify a window of opportunity in which, despite its nominal military superiority, it lacks the stockpiles to fight and win a **long-term major-power war**. A multi-front war would be immensely stressful to American capabilities. It may be reasonable to expect, despite capability gaps that persist between the U.S. and its rivals, that a coordinated campaign in Europe, Asia, and the Middle East would crack the United States. This can be prevented. The U.S.' ability to deter conflict should be regained. Meanwhile the U.S. Navy - the primary warfighting arm for any future Eurasian conflict, must be **expanded** and **better-resourced**. The current NDAA is a start, providing $45 billion more than the Biden administration's initial proposal. Yet this is, at best, a minimal initial move. The Pentagon expects China's combat fleet to grow from its current level of 340 ships to 400 by 2025, or 20 ships yearly. Were the U.S. to build 20 each year, it would reach — in 2025 — slightly above China's current fleet size, but the Biden administration isn't even planning to build half that number.

Our impact is empirically proven. History shows that naval power is directly related to global stability.

Jerry **Hendrix 21**. Vice president at the Telemus Group. "Sea Power Makes Great Powers." https://foreignpolicy.com/2021/10/10/us-navy-sea-power-china-decline-military-strategy/

Centuries of global rivalry show how a country's power — and its decline — is **directly related** to the size and capability of its **naval and maritime forces**. The ability to ship goods in bulk from places where they are produced to places where they are scarce has **long represented** an expression of **national power**. Athens had a robust navy as well as a large merchant fleet. Carthage in the third century B.C., Venice in the 13th and 14th centuries, and the Dutch republic in the 16th and 17th centuries also fielded merchant and naval fleets to pursue and protect their interests. In this way, they were able to transform their small- and medium-sized nations into great powers. Following the Napoleonic wars in the early 19th century, a large Royal Navy effectively knitted together the British Empire upon which "the sun never set." By the latter half of that century, the British maintained a "two-power standard," whereby the size of the Royal Navy had to meet or exceed the next two navies combined. That ultimately proved unsustainable. It was the doubling of the U.S. Navy battle force under President Theodore Roosevelt that catapulted the **U**nited **S**tates to **global power and prominence**. Most historians view the 14-month world cruise of new U.S. battleships — Roosevelt's Great White Fleet — as the birth of what would come to be known as the **American Century**. **The dramatic expansion** of the U.S. fleet through two world wars — finishing the later conflict with more than 6,000 vessels, by far the largest navy ever afloat — set the country on its **superpower path**. Finally, Ronald Reagan's 600-ship Navy, as much a **p**ublic **r**elations campaign as it was a **shipbuilding plan**, helped convince the Soviet Union that **it would not win** the Cold War. Throughout history, large naval and merchant fleets represented not just a **power multiplier** but an **exponential growth factor** in terms of **national influence**. All **historical sea powers** recognized this — until they didn't. In October 1904, Adm. John "Jackie" Fisher was appointed first sea lord of the Royal Navy. He arrived in office certain who the enemy was — Germany — but also with clear direction from civilian leadership to tighten his belt and accept declining naval budgets. Fisher's solution to this strategic dilemma was to dramatically shrink the fleet in order to pay for modernization while also concentrating the remaining ships closer to Great Britain. His investments in modernization were breathtaking — most notably the introduction of a steam-turbine,

all-big-gun battleship, the HMS Dreadnought, which would lend its name to all subsequent battleships that followed, transforming global naval competition. But Fisher paid for his modernized vessels by massively culling the 600-ship Royal Navy he inherited from his predecessor. “With one courageous stroke of the pen,” then-Prime Minister Arthur Balfour approvingly stated, Fisher slashed 154 ships from the Royal Navy’s active list. Fisher classified some of these ships as “sheep,” which were sent to the slaughter in the breakers’ yards; others as “llamas,” downgraded but retained in the reserves; and still others as “goats,” which retained their guns with the stipulation that no further maintenance funds would be allocated to them. The cull, however, wasn’t cost-free. Most of the cuts were taken from gunboats and cruisers assigned to nine distant stations where Britain had national interests, such as in Asia or Africa. The cuts generated great criticism not only from within the Royal Navy, which was manned by officers with long experience and strong views regarding the importance of a naval presence overseas, but also from the British Colonial and Foreign Offices, which instantly recognized that they would no longer be able to call on readily available Royal Navy ships to support the nation’s diplomatic interests. Ultimately, Fisher did modernize his fleet in the short term. Both the Dreadnought class battleships as well as their consorts, the smaller Invincible-class battle cruisers, rendered all previous designs instantly obsolete. What Fisher did not anticipate was that his contraction and modernization of the Royal Navy would create two simultaneous effects: It destabilized the international environment, and it triggered a global naval arms race. Britain had already been under pressure in the Far East and had asked Japan for assistance protecting its interests there, but now it found itself without a fleet of sufficient size to defend its interests in other geostrategic locations like the Caribbean and Africa. It had to trust a new partner, the United States, to take on that job. The only alternative would have been for Britain to simply forgo its colonial interests in order to focus on what it viewed as the preponderant German threat in the Baltic, North Sea, and northern Atlantic Ocean. There were other knock-on effects. Having surrendered its dominant lead in **overall ship numbers**, Britain found itself in a **new naval arms race** in which its previous, sunk-cost investments in older ships offered no benefit. To its dismay, Britain began this new arms race from nearly the same position as its geostrategic rivals. Soon every European power, as well as the United States and Japan, was building modern dreadnoughts, and Fisher and his navy were unable to maintain or reestablish their previous two-power standard. Today, Fisher’s strategy would be recognized as a divest-to-invest modernization plan. And the lesson is clear: Britain found that it was unable to preserve **even the facade** of being a global power; it was **quickly reduced** to being a **regional maritime power** on the **periphery of Europe**. The **ensuing conditions** of international instability, shifting alliance structures, and the global arms race contributed to the outbreak of **World War I** and the **end of empires**, including Britain’s.

Advantage 2: Arctic Research

Arctic research is being thwarted by a lack of icebreakers now.

Peter **Suciu 24**. Michigan-based writer. He has contributed to more than four dozen magazines, newspapers, and websites with over 3,200 published pieces over a twenty-year career in journalism. "U.S. Navy’s Arctic Dilemma: Icebreaker Shortage Sparks Concern." 19FortyFive. 12-10-2024. https://www.19fortyfive.com/2024/12/u-s-navys-arctic-dilemma-icebreaker-shortage-sparks-concern/

As Russia and China Eye the Arctic, **U.S. Lacks Critical Icebreaker Fleet**

The United States Navy currently operates 11 nuclear-powered aircraft carriers, nine cruisers, and around 75 guided-missile destroyers – but it lacks a **type** of **vessel** that could be **increasingly important** should it be required to operate in the Arctic.

Since 2022, the Pentagon has been warning that the U.S. needs more icebreaker ships. The ice may be melting in the great white North, but **icebreakers** are **still required** for the U.S. to have **year-round access** to what is **likely** to be an increasingly **contested region**.

The United States Coast Guard – which is part of the Department of Homeland Security not the Department of Defense – currently operates just two aging icebreakers.

The problem was made **worse this past summer**, when USCGC Healy (WAGB-20), the largest and most technologically advanced icebreaker, was **taken** out of **service due** to an **electrical fire.** That forced the

cancelation of **two scientific missions** to the Arctic via the **Northwest Passage**. The other icebreaker, USCGC Polar Star (WAGB-10) – which is like WAGB-20 homeported in Seattle – is tasked to travel to McMurdo Station, Antarctica, annually.

A 2023 study (updated in July 2024) from the Congressional Research Service concluded that the U.S. requires at least **eight** or **nine polar icebreakers**. As a stopgap, the Coast Guard announced it would acquire a commercial icebreaker and station it in Juneau, Alaska.

Melting Ice Makes the Problem Worse

This is not entirely a new problem, but it is one that climate change could make worse. In early 2022, the Pentagon **warned** that it **required additional icebreakers**, especially as Russia has put renewed interest in the Arctic region.

The melting ice has opened up new shipping routes that previously didn't exist, while the region is rich in resources. To protect U.S. interests **may require deploying warships** to the **Arctic** – and while the ice is melting, it does return in the winter, necessitating the **need** for more **icebreakers**.

"Strategically, icebreakers provide **persistent presence** in a way that's not met by **anything** else in the **maritime region**," Randy Kee, who had served as the senior advisor for arctic security affairs with the Ted Stevens Center for Arctic Security Studies, explained in a Pentagon report. "Remember, the Arctic is a maritime region, and icebreaking provides you **year-round access** to be able **to go in the region."**

Without the icebreakers, the U.S. may "not be able to participate in the opportunities opening up or protect its interests," the DoD further warned.

Upgrading research capabilities by procuring new icebreakers is key.

Hannah **Fuller 23**. Media Relations Officer. "Antarctic Research Remains Critical to National Security and Economic Interests; U.S. Investment in New Icebreaker and Other Infrastructure Is Essential, Says Report." National Academies. https://www.nationalacademies.org/news/2023/10/antarctic-research-remains-critical-to-national-security-and-economic-interests-u-s-investment-in-new-icebreaker-and-other-infrastructure-is-essential-says-report

A new report from the **National Academies** of **Sciences**, Engineering, and Medicine outlines the importance of **access to the** Southern Ocean and Antarctic coast for **research** on **critical aspects** of **global ocean** and **climate systems**, especially related to **climate change**. **Aging infrastructure** available to U.S. researchers should be replaced and include a **new icebreaking research vessel** and other **equipment** that can support continued and expanded **U.S. research and technological interests**, says the new report.

A robust U.S. **research presence** in these regions, which are some of the harshest and most remote places on Earth, is essential for **national security** and economic **interests**, the report says. It identifies three thematic scientific drivers — global **sea-level rise**, the **global carbon cycle**, and **changing ecosystems** — and related high-priority research questions as justification for renewed investment in vital infrastructure and programs in the near term, especially construction of a Polar Class 3 Antarctica Research Vessel (ARV).

"These areas of **scientific research** may be physically far away from the U.S., but the **effects** of **climate change** on these areas and their resources are felt close to home," said Paula Bontempi, dean of the Graduate School of Oceanography at the University of Rhode Island, and co-chair of the committee that wrote the report. "The U.S. is a leader in Antarctic and Southern Ocean research, and we must make a continued commitment to understanding these large systems that have national and global impacts."

The urgency of this research is increasing, as Antarctica's ice sheets may be approaching a dangerous tipping point toward a prolonged period of ice loss driven by climate change. Antarctica's 58 meters of sea-level rise potential will have global-scale impacts, yet uncertainty remains about rates and extent of ice mass loss and the long-term trajectory of sea-level rise. The Southern Ocean is also where most deep waters rise to exchange carbon with the atmosphere, and is responsible for about 40% to 50% of the net removal of fossil fuel derived CO2 emissions. Thus, there is a need for scientists to better understand how its carbon reservoir may change. The ecosystems in this region are also uniquely adapted to extreme environments and perform important functions that regulate the exchange of energy, nutrients, and carbon throughout the area's food webs. Considerable uncertainty remains about how ecosystems are responding to a changing climate and may impact important natural systems that directly or indirectly benefit humans and global economics.

The National Science Foundation's Office of Polar Programs (OPP) is charged with supporting Antarctic science and logistical operations. However, the aging science infrastructure that serves the region will not be able to support the research necessary to advance U.S. interests. Without major and immediate investments, including urgent investment in a new ARV, the U.S. will fall behind other nations in research that is essential to national security, the report says.

"The U.S. is already behind schedule in updating our scientific infrastructure in the region, **especially** for **aging research vessels**," said committee co-chair Alan Mix, distinguished professor of earth, ocean, and atmospheric sciences at Oregon State University. "While the committee applauds the tentative commitment of the U.S. government and NSF toward an ARV, NSF must urgently move forward with next steps to make a **new vessel** and other **needed infrastructure** a reality."

Scenario 1: Disease

Icebreakers are key to weather, climate, and oceanographic research.

Abbie **Tingstad et al 20**. PhD in Geography, senior physical scientist at the RAND Corporation; Scott Savitz, senior engineer at RAND; Dulani Woods, quantitative analyst at RAND; Jeffrey A. Drezner, senior policy researcher at the RAND

Corporation. "The United States Needs More Polar Icebreakers." Rand. 12-8-2020. https://www.rand.org/pubs/perspectives/PEA702-1.html

Increased Demand for Icebreakers

The diversity of potential situations in which icebreakers might be employed must also continue to be considered in acquisition planning. As of 2020, the United States' polar icebreakers conduct **primarily two missions**. The first is **scientific research**, performed together with the National Science Foundation and other partners: Understanding polar environments is important in **characterizing global weather** and **oceanographic patterns**, as well as how these **are changing over time**. The second mission is resupply, primarily **for research stations** in Antarctica but also for remote **Alaskan communities**. For example, during the winter of 2011–2012, the medium icebreaker Healy enabled a tanker to deliver critical fuel supplies to the city of Nome, Alaska. In addition, these cutters have **enabled presence** and **readiness** for possible polar **contingencies**, such as **search-and-rescue events**; the Healy was present for parts of the Crystal Serenity's historic transit of a large cruise ship from Seward, Alaska, to New York through the Northwest Passage with 1,700 passengers and crew members aboard (Rosen, 2016).

All signs point to an increased demand for the Coast Guard's missions in the coming decades and potentially expanding roles for these cutters. **Scientists** need to **conduct research** on **polar climate conditions** to increase their understanding of regional influence on the rest of the world. Foreign and domestic commercial interests will continue to explore the polar regions in search of shorter **transit times** for vessels; **extraction** of **resources**, such as **minerals**, **oil**, and **fish**; and **tourism**. Some of this monitoring can be done from the air or via satellite. For the next several decades, however, human beings will still need to **actively collect** and **evaluate samples** from the **polar regions**. In addition, demand for resupply and even rescue may grow as the poles become more accessible thanks to reduced summer ice cover,

contributing to increased human activity in the region. As this occurs, U.S. policy requires the Coast Guard to maintain a capability to oversee national interests by executing its statutory missions.

Furthermore, U.S. interests and maritime mission demands in the Arctic and Antarctic will always differ from each other because of immutable geographic considerations: The Antarctic is a land mass surrounded by water, while the Arctic is an ocean surrounded by land, including the U.S. state of Alaska. The Arctic contains permanent populations, some of whom have lived there for millennia, as well as resource extraction that dates back decades. Although the region has some diplomatically managed maritime boundary disputes, almost all of its lands are unambiguously part of specific nations. On the other hand, the Antarctic and its surrounding oceans have no permanent inhabitants and no commercial activity except fishing and are subject to unrecognized claims by various nations. The absence of commercial activity may change because the provisions of the Antarctic Treaty that forbid resource extraction in the region (Argentina et al., 1961) are open to revision in 2048, well within the lifetime of future polar icebreakers. If **extraction** of **oil** or **minerals** led to disaster, U.S. **icebreakers** might be **needed to help respond**.

Emerging diseases from the Arctic are inevitable. Increased research is essential to detect and respond to them.

Denise **Schiavone 24**. Communications Strategist/Writer at The MITRE Corp, Retired Lieutenant Commander at US Navy. "As the World Warms: Fighting the Spread of Disease from the Arctic." MITRE. 4-4-2024. https://www.mitre.org/news-insights/impact-story/world-warms-fighting-spread-disease-arctic

Searching for "cold hard" proof of global warming? Look no further than the melting ice of the Arctic. Warming twice as fast as the rest of the planet, the region is recognized as a frontline for climate change. With potential global implications, the thaw begs the question: Do we know what pathogens lie in wait underground?

Imagine the **next pandemic** developing from **harmful microbes present** within **permafrost**, part of the long-frozen Arctic terrain. This scenario may sound like science fiction but is an **all-too-real threat**.

In 2016, for example, 13 people in Siberia became ill from anthrax spores linked to the thawed carcass of a reindeer that died 75 years prior. **Surveillance systems** do exist to monitor such incidents as **disease** presents in people. But no system exists to **detect pathogens** in the **environment** before **diseases strike**.

"Essentially, we know when people get sick, but we don't always know the locations where people were exposed," says MITRE epidemiologist Alex Wu. He led a MITRE research team in taking the first step toward developing a more proactive approach to battling diseases that could emerge from permafrost.

Our experts reviewed the state of the science of current efforts to surveil pathogens in the Arctic. They identified a **significant gap** in **understanding** where potentially **dangerous microorganisms** may **reside in permafrost**. And they demonstrated how **pathogens** could be **mapped to alert public health officials** to their presence **before people fall ill**.

"We need an **integrated system** that combines the information from permafrost thaw, climate prediction models, human activity, soil microbial data, and locations of human and animal remains," Wu explains. "This will be vital to the next **phase** of **fighting diseases** at their **origin** to **prevent their spread**."

The icy Arctic has long been home to myriad pathogens. While frozen, these pose no risk to human health. But increasing human engagement in the region means as temperatures increase, so does **people's risk** of **harmful exposure**. From indigenous populations and oil pipeline staff to U.S. military personnel, those living and working in this remote territory may become vulnerable.

Wu, formerly an epidemic intelligence service officer for the U.S. Centers for Disease Control and Prevention (CDC), has long held a fascination with the Arctic area. In his youth, he spent many summers visiting Alaska with family friends—and became fascinated with its beauty.

When he came to MITRE in 2021 and learned of our independent R&D program, it prompted a proposal to explore the question: "How can we prepare for another pandemic-type pathogen that could blindside us from other regions, such as the far North?"

Pandemics risk human survival.

Cody **Fenwick 25**. Research Analyst at 80,000 Hours, holds an M.A. from The Graduate Center, City University of New York, "Preventing catastrophic pandemics", first published in '20 and updated in '25, https://80000hours.org/problem-profiles/preventing-catastrophic-pandemics/

Some of the deadliest events in history have been **pandemics**. **COVID**-19 demonstrated that we're **still vulnerable** to these events, and **future outbreaks** could be **far more lethal.**

In fact, we face the possibility of **biological disasters** that are **worse than ever** before due to **developments in technology.**

The chances of such **catastrophic pandemics** — bad enough to potentially **derail civilisation and threaten humanity's future** — seem **uncomfortably high**. We believe this risk is one of the world's **most pressing problems.**

And there are a number of **practical options** for reducing global catastrophic biological risks (GCBRs). So we think working to **reduce** GCBRs is one of the **most promising ways** to safeguard the **future of humanity** right now.

Scenario 2: Biodiversity

Increased scientific observation is necessary to preserve Arctic biodiversity.

Understanding the Arctic is key to broader sustainability.

Gloria **Dickie 21**. Freelance journalist who writes frequently on biodiversity conservation, climate change, environmental law and policy, and sustainable agriculture. "Arctic biodiversity at risk as world overshoots climate planetary boundary." Mongabay Environmental News. 4-29-2021. https://news.mongabay.com/2021/04/arctic-biodiversity-at-risk-as-world-overshoots-climate-planetary-boundary/

Today, bowhead whales still **transit** the **fringes of Arctic waters**. Polar bears hunt blubbery ringed seals from rafts of ice. And ivory gulls ride gale force winds, plucking juvenile polar cod from the roiling sea. But **for how much longer?**

Despite more than a **century** of **scientific observation**, the Central Arctic Ocean remains one of the **least studied bodies of water** in the **world**. **Hostile weather**, **multiyear sea ice**, total **darkness** part of the year, and **remoteness hinder researchers** endeavoring to better **understand** this region, its **unique biodiversity,** and **dramatic shifts underway.**

What we do know is this: The Arctic is changing quickly as the poles warm. Sea ice cover, which has endured for millennia, is quickly disappearing, thinning and shrinking as the biome heats up at twice the rate of the rest of the world. In the absence of ice, southern species are moving north, sometimes making refugees and relics of long-term residents.

We also know we can no longer afford for the **Central Arctic Ocean** to be a **mystery**. As the region heats up, the web of life that once tied together cold-loving species living in and near its enigmatic waters has **begun to unravel**, and may soon verge on collapse as the **old guard fails** to **compete** with, and gives way to, a new regime with largely **unforeseeable consequences**.

All of Earth's natural systems hang in a delicate balance. Add too much of one thing — carbon dioxide, aerosols, nitrogen, Homo sapiens — or subtract too much of another — forests, freshwater, keystone species — and suddenly biodiversity and **biomes can go askew**. Put more eloquently, **scientists** theorize that there are **nine planetary boundaries** beyond which limits we **may not go and must abide by**. If we do exceed these boundaries, our **societies** and **species** — our safe operating spaces for **humanity** — are in **jeopardy**.

So far, we've already surged into the danger zone for four of the nine planetary boundaries: climate change, biodiversity, land-system change, and biogeochemical flows (disruption of the nitrogen and phosphorous cycles). This is particularly bad news for **Arctic Ocean biodiversity**, which has felt some of the ramifications of these **life support system imbalances** and shocks far sooner than anywhere else on Earth. Like dominoes **falling** into **one another**, **serious changes** are **impacting** life at the **top** of the world.

One of the most sweeping polar biodiversity changes involves Arctic microbes: As warming sea thin ice cover, phytoplankton — free-floating microscopic marine algae — are booming.

Phytoplankton form the basis of the marine food web and they're dependent on sunlight to grow. In the Arctic Ocean, blooms often occur over the continental shelves after ice melt in open water when the microalgae is bathed in 24-7 sunlight in summer. Indeed, much of the biological production in the Arctic takes place in these areas due to the formation and melt of annual sea ice, which regulates the biogeochemical cycling of organic carbon and other elements in the water column.

But in 2011, scientists discovered a massive and utterly unexpected phytoplankton bloom underneath thinned Arctic sea ice in the Chukchi Sea between Alaska and Russia, one of five peripheral seas of the Arctic Ocean. Biologists had previously believed this almost impossible; sea ice and snow reflect incoming solar radiation, starving plant-life of energy.

But the thinning of sea ice had allowed light to penetrate the dark waters of the Arctic Ocean, allowing phytoplankton to photosynthesize and flourish.

"Climate change has made the Arctic more productive," says Kevin Arrigo, a biologist at Stanford University who led the study published in Science. "Because there's so much first-year ice in the Arctic, and it's thin and flat, light has an easier time reaching the water below."

Arctic phytoplankton blooms now last longer. And they're more abundant in terms of how much biomass is produced. Though scientists found evidence of such blooms occurring in the past if the conditions were exactly right, these under-ice blooms are happening more often as the "Arctic is more amenable to blooms than it used to be."

Every Arctic species relies on energy from phytoplankton. Krill and copepods eat the plankton, which in turn are eaten by fish, which are eaten by seals, which are eaten by polar bears. "Everything starts with phytoplankton," says Arrigo.

At first glance, the microscopic blooms would appear to be good news. More productive northern waters should help Arctic species. But that's not strictly the case, Arrigo says. "There's a potential dark side." As climate change destabilizes phytoplankton at the base of the food chain, "the Arctic is becoming less like the Arctic and more like the North Pacific."

Increasingly, southerly animals are moving in to take advantage of the new productivity.

One fish, two fish, red fish, new fish

Warming seas have triggered a **poleward shift** in fish species in the Arctic, reshuffling the food web as we know it.

The peripheral Barents Sea, north of Norway, is one of the better-studied Arctic marine regions where this species shift is occurring. When scientists surveyed 52 fish species there in a 2017 PNAS study, they found that Arctic bottom-dwelling species that feast on shellfish and invertebrates on the seafloor were gradually being replaced by incoming boreal fish species — primarily generalist species, such as cod and haddock — that eat smaller Arctic fish and outcompete native species, potentially creating an imbalance in the food system. These boreal fish have been documented moving into the North American Arctic and Eurasian Arctic.

“As the North Atlantic is warming, the cod is expanding northward,” says Maria Fossheim of the Norwegian Institute of Marine Research. “There’s now more space for it to occupy in the Barents Sea and there’s more food. In the past, subzero temperatures and sea ice stymied their Arctic advance.”

Much of this climate change-driven shift in polar fish species is occurring near the shallow continental shelf seas bordering the Central Arctic Ocean, areas traditionally neglected by the world’s large fishing fleets because commercially desirable fish had been sparse there. But inevitably, analysts say, this climate change-driven move by targeted species — including cod, haddock and others — will lure fleets northward, putting new environmental pressures on high latitude waters.

Also, as southerly fish move in, native Arctic fish lose out. The polar cod, for example, is an ice-associated species; it feeds on zooplankton on the underside of sea ice. With less ice floating atop the ocean along with warmer temperatures, polar cod populations are expected to decline 17% by the end of this century.

These changes in the food chain could “alter the **structure**, **composition** and functions of **future** Arctic **communities**,” reads a recent study from researchers at Hokkaido University. By century’s end, such changes are likely to be felt in every node of the Arctic food chain, though predicting precisely what the radically altered polar marine biome will look like is impossible.

“What we’re seeing in this ecosystem is that mammals, fish, seabirds, and plankton are all moving,” says Fossheim. “The whole regime is shifting. But you can’t move everything north. At some point, some species won’t be able to live there.” Smaller fish adapted to living at 300 meters depth, for example, can’t very well move to 3,000 meter depths in the Central Arctic Basin. Soon, Fossheim says, these changes will impel biodiversity loss.

Birds of a feather

For scientists, seabirds are the canary in the Arctic Ocean’s coal mine. “They’re very useful indicator species,” says Grant Gilchrist, a research scientist at Environment and Climate Change Canada.

Birds are long-lived; they can be marked with a band; scientists can take blood samples; and they can be tracked year to year — sometimes by satellite. All these tracking and diagnostic tools are useful in the remote Arctic environment. Birds “forage and sample in places where it’s hard for humans to sample,” Gilchrist says.

Tracking the health of seabirds and their populations, scientists can gain insights into what’s happening in the far North. Few seabirds venture far into the High Arctic; most live in high densities along the edges of the Central Arctic Ocean, around the Arctic Ocean gateways.

But the ivory gull is different. It originates in Canada, Greenland, Svalbard, and Russia, and is dependent on year-round pack ice — foraging fish and invertebrates along the productive ice-edge.

However, “Their populations have been declining quite drastically,” says Kathy Kuletz, a wildlife biologist with the U.S. Fish & Wildlife Service and a member of the Circumpolar Seabird Expert Group of the Conservation of Arctic Flora and Fauna. In the last 20 years, it’s estimated that between 80 and 90% of the ivory gull population has been lost. Only between 8,000 and 11,500 breeding pairs are left in the world.

In 2017, the Conservation of Arctic Flora and Fauna, the biodiversity working group of the Arctic Council, released their State of Arctic Marine Biodiversity Report. It found that some populations of seabirds in the Arctic’s lower latitudes were also declining; thick-billed murres in the Atlantic Arctic were decreasing, as were kittiwakes in the Atlantic Arctic and Davis Strait (between Greenland and Canada’s Baffin Island).

As with other species, climate change is creating winners and losers among seabirds in an altering Arctic. Though murres, ivory gulls, and kittiwakes may be struggling, planktivorous seabirds appear to be increasing in the Chukchi Sea. Conversely, little auk adults are seeing a decrease in survival rates, perhaps due to negative climate impacts on their main food source — Arctic copepods. Black guillemots in the Beaufort Sea are experiencing more breeding failures as they’ve been forced to feed their chicks lesser quality food due to a lower abundance of polar cod.

The charismatic megafauna

Higher up the food chain, Arctic mammals likewise face an uncertain future.

In fall of 2021, Fisheries and Oceans Canada will begin consultations on whether to list ringed seals under the federal Species at Risk Act. These blubbery pinnipeds have historically been abundant throughout the Canadian Arctic and are considered a critical prey species forpolar bears.

During the winter, when snow falls heavily on the sea ice, ringed seals dig out birth lairs in drifts above their breathing holes. This provides protection from bears. When spring comes, the ringed seals birth their pups in these lairs. But without deep snow and ice — an increasingly more common condition in a warming Arctic — ringed seals can’t protect their vulnerable young. That may be why some Inuit communities, who hunt the animals, say they’ve witnessed a decline in the seal’s numbers in recent years.

Likewise, the loss of sea ice is driving polar bears onto land where they can no longer access the seals. In a recent study, scientists examined the energy needs of polar bears forced ashore, determining that they would need to consume approximately 1.5 caribou, 37 Arctic char, 74 snow geese, 217 snow goose eggs, or 3 million crowberries to even come close to the energy provided by the blubber of a single adult ringed seal.

The polar bears have been expending far more energy searching for food now than when the sea was in its ‘normal’ state. It’s going to be almost impossible for polar bears to adapt to life on land as the Arctic sea ice melts out.

Scientists estimate that all but a few polar bear populations will likely be gone by 2100. The animals will only likely persist in the Queen Elizabeth Islands — the northernmost part of the Canadian Arctic Archipelago — and still roam into the Central Arctic Basin past century’s end.

Narwhals, the so-called unicorns of the sea, are also struggling. Reliable breathing holes are harder to come by due to unpredictable shifts in mobile sea ice. This has led to instances of the marine mammals becoming trapped and dying under the ice.

“Anything that requires ice as a home, or a platform to hunt from, is going to start doing worse,” says Stanford’s Arrigo. But other transitory species, like gray whales, which feed off the productive bottom, could do really well as the Arctic becomes more productive.

“A lot of species are going to be coming in from far away,” he adds. “But that’s one of the scary things about all this. If they don’t time it correctly, and the Arctic’s productivity happens a month earlier, the migratory species coming in from the Southern Hemisphere will struggle. There’s a hard limit,” he says. In a biome as harsh as the Arctic, there’s little room for error.

So, what to do?

In 2018, ten parties signed an **international agreement** to prevent **unregulated commercial fishing** in the Central Arctic Ocean until **scientists** have a better **understanding** of the **profound regime shifts** underway. The agreement will also take into account Indigenous and local knowledge; foster **scientific cooperation**; and establish **conservation** and **management** measures before any fishing is permitted to occur in the **vulnerable region**.

Once all parties have ratified the agreement it will remain in place for 16 years, subject to automatic renewal if all parties agree. As of 2021, nine out of 10 parties have ratified the agreement, including the United States, Japan, Russia, and the European Union. Only China has yet to finalize its participation, irking some governments.

When asked by Mongabay about the delay at a policy forum in February, Gao Feng, China's special representative for Arctic Affairs, noted that the agreement was a milestone achievement and insisted that China "has no political obstacle for the final approval. The only matter is time and our internal procedure."

Though the climate change planetary boundary may have been crossed globally, rapid **international action** could curb the **worst biodiversity catastrophes** in the Arctic, **tropics** and **elsewhere**. And there **are protection measures** that can still be taken to help safeguard the world's **flora** and **fauna**, as highlighted by the Central Arctic Ocean Fisheries Agreement.

However, such sweeping moves will take sincere cooperation between nations, a huge **investment in scientific research**, and rapid implementation of globally coordinated **conservation efforts** on a **level never accomplished before**. Whether this all will be accomplished in time remains to be seen. Meanwhile, the ice continues melting.

Biodiversity collapse causes extinction.

Rupashi **Chhabra 23**. Holds an M.A. from Indira Gandhi National Open University, Creator of Alyssum Magazine, "Most Threatened Biodiversity Hotspots in the World", https://www.yoair.com/blog/most-threatened-biodiversity-hotspots-in-the-world/

The **diversity** of plant and animal species in the world as a whole are **the most essential units** of **Earth's life-support systems.**

One of the major reasons for defining the importance of biodiversity hotspots on earth. **Biodiversity** acts as the **building block** of **all life on Earth.** A myriad of diverse species creates an **intricate system** for biological interaction & a balanced ecosystem where **life is made possible**. The grand species diversity ensures natural sustainability for **all forms of life**. Without species and a **balanced ecosystem**, for instance, there would be no **food to eat**, no diversity in **genes**, no **air to breathe**, or no **water to drink.** It, therefore, means that **without biodiversity**, humans would equally **be non-existent** because biodiversity hotspots are **vital** for **human survival.** The map of hotspots extends extraordinarily beyond the map of the natural areas that most benefit human populations.

Advantage 3: Resources/ Rare Earth Minerals

The race for Arctic resources is on, but the US is set to be left out because we lack the ability to build new icebreakers.

Rana **Foroohar 25**. American author, business columnist and an associate editor at the Financial Times. "10 days with the US Coast Guard on the new Arctic front lines." Financial Times. 2-8-2025. https://archive.ph/RXHH9#selection-1827.0-1827.13

There is one other thing in Nome: the United States Coast Guard. This is the branch of the American military that polices the country's waters for everything from drug trafficking and illegal fishing to Russian and Chinese spying. The Coast Guard does lots of other things too, like rescue distressed vessels or people, chart new shipping pathways and facilitate scientific research. I'm here to board the USCGC Healy, an "icebreaker" that can navigate through ice nearly 5ft thick. Of the Coast Guard's fleet of 241 active "cutters", which are ships 65ft in length or greater, **only two** are **icebreakers**.

The fact that the US has so few is the reason I'm here. These ships are crucial to **exploring** and **protecting the Arctic**, which is fast becoming one of the most hotly contested places on earth (and that was well before Donald Trump suggested buying Greenland). But the US hasn't **built a new icebreaker** in **quarter** of a **century**. In **fact, it can't**. Thanks to the dramatic shrinking of the commercial shipping industry, the country is **incapable** of **efficiently** producing **vessels** like this on its own. The most recent effort is five **years behind schedule** and **wildly over budget**.

The **desperate need** for ships is a **rare point** of **bipartisan agreement**. The Biden administration signed a deal with Finland and Canada to jointly produce more icebreakers. But the idea was actually first floated by Trump during his first term. Now, his National Security Council will push forward the "ICE Pact deal", bringing Finnish engineering expertise to the US with the aim of building considerably more icebreakers for the US and its allies over the next 10 years. The bipartisan Ships for America Act, which offers support for America's shipbuilders, was introduced last December and co-written by former Congressmen Mike Waltz, who is now Trump's national security adviser.

"The president and I understand the economic and national security importance of a strong US maritime industrial base," Waltz told the FT. "The president understands the strategic need to revitalise our commercial maritime industry and invest in additional US icebreaking capabilities." Waltz said there would be a "whole-of-government effort to get ships on the **water** as **quickly** as **possible** [that] will include putting forth an emergency request to **Congress** for **funding**. We will remove any constraints that prevent US shipbuilders from delivering vessels on time and on budget and, when necessary, work with our allies to ensure we have the ships we need."

Trump's interest in the Arctic isn't only martial, it's commercial. Global warming has led to **melting polar ice caps**, opening up **new sea lanes** that could halve transit times between **Asia** and **Atlantic ports**. Currently, the best sea lane is along Russia's northern coastline, which it claims as its own. But new passages in international waters would in effect **redraft** the **blueprints** for **global supply chains,** mitigating the effects of **conflict** and **accidents** at **choke points**, such as in the South China Sea and the Panama and **Suez canals**.

Less polar ice also means easier access to sea beds, where there are huge reserves of **rare earth minerals**, **oil** and **natural gas**. Competition between the US, Russia, China and other nations to see who will claim and tap those resources began years ago. That also means the Arctic is increasingly becoming a zone of military and espionage operation. This growing list of reasons means the **Arctic** is about to get a lot **more attention**.

The plan solves. A nuclear-powered icebreaking capability is the key to unlocking Arctic resources.

Eric James **Szandzik 18**. Owner and CEO of The EJS Consulting Group, Bachelor of Science in Business Management from the Western Governors University. "Spectating the Great Arctic Game." International Affairs Forum. 11-18-2025. https://www.ia-forum.org/Content/ViewInternal_Document.cfm?contenttype_id=5&ContentID=8760

The changing Arctic landscape will have enormous consequences within the realm of international affairs over the next century. The United States is unequipped and **unprepared** for such **changes**, and currently lacks the **urgency** needed to address this **strategic vulnerability**.

The world's northern Arctic waterways are more navigable than ever before. Surveys during the Arctic's warm season show that total ice coverage has decreased from an average of 3million square miles thirty years ago to around 1.9 million square miles today.[i] This changing scenario, along with the preparation of **other sovereign states** that lay claim to **Arctic regions**, requires that the US heavily **invest** in Arctic **research**, **resource**

development, the US Coast Guard, and the US Navy. Given recent budget proposals and current trends, the funds allocated to such segments within the US government fails to initiate such growth and scarcely maintain levels of sustainability.

Over the next decade, Arctic waterways are projected to become even more accessible than current levels: The open water season of the Bering Strait (the 51 mile gap between Alaska and Russia) will grow from 23 weeks to 27 weeks), the Northern Sea route's open water season (following the northern border of Russia and Norway) will grow from four weeks to nine weeks, and the Northwest Passage (which guides along Canada and west of Greenland) will be a new open water region and will remain open for five weeks during the year.[ii]

Such an opening of the Arctic's waters has unveiled one of the **earth's largest reserves** of **valuable resources**. It is estimated to have around 13% of the world's oil reserves and 30 percent of its natural gas reserves.[iii] To compare with a well-known source of oil already established, Saudi Arabia has 21 percent of the world's proven oil.ix These initial surveys have only been able to capture "conventional" energy resource extraction, not the new innovative extraction methods involving shale rock.[iv]

Alaska's continental shelf, which reaches approximately 600 miles into the Arctic Ocean, contains an estimated **one third** of the **oil** and around **18% of all natural gas** within the **Arctic**.[v]'[vi] The only comparable region in terms of oil and natural gas probability is Russia's **Western Siberian Basin**.[vii]It is of significant importance that 84% of all oil and natural gas potential in the Arctic remains offshore.[viii] While the Arctic waterways are becoming more accessible during a couple warm months out of the year, most of the time, it is a frozen ocean with a labyrinth of ice.

In addition to the oil and natural gas resources within its domain, the Arctic also holds **massive deposits** of **rare earth minerals** estimated at **$1 trillion**.iii Most **electronic components** are made with some **element** of **rare earth minerals**. Northwest Alaska houses the largest known zinc mine; Russia's Western Siberia region is home to vast quantities of nickel, palladium, and copper; and Canada's Baffin Island sits on one of the largest deposits of iron-ore.[ix]

Beyond the vast array of resources within the Arctic, it is also of strategic importance in terms of maritime traffic. Using the Arctic waterways to transport from Northern Europe to the US West Coast could reduce transportation costs by 20%.ix The Arctic's Northern Sea Route, which connects Europe and Asia, would reduce travel time by 27%. With more accessible summer sea lanes, traffic is already increasing. From 2010 to 2013, vessels through the Northern Sea Route went from 4 to 71,[x] and from 2005 to 2012, the Bering Strait saw an increase of 50% in transports.viii

The **key** which **unlocks access** to all of the **Arctic's resources** and **transport lanes** is a massive specialized ship: **The Icebreaker**. Medium icebreakers can break ice as thick as 8 feet and can also crush 4.5 feet of ice while maintaining a constant speed of three knots (3.5mph). Heavy icebreakers can break up to 21 feet of ice and can also break 6 feet of ice while cruising at three knots.[xi] Arctic highways are continually being opened, but after some time, freeze closed once again. Maintaining any **sustainable operations** within such waters requires the **all-important icebreaker vessel.**

Some Arctic powers have long understood the importance of the region. Around one fifth of Russia's current economy is connected to those areas within the Arctic Circle.iii They have already begun oil and natural gas production within the Western Siberia region and have also begun shipping oil from new offshore terminals.ix Gazprom, Russia's largest natural gas organization, has already commenced resource development within the Arctic's Barents Sea.ix

Such recognition of the Arctic's resource potential has provoked Russian expansionism into its northern waters. In 2001, Russia petitioned an international body to have their national sovereignty recognized as far as the North Pole, an issue which remains pending.[xii]Six years later, a Russian Arctic scientist mounted a Russian flag just beneath the North Pole.[xiii] His response to international criticism was not tailored to the politically sensitive ear, "I don't give a damn what all these foreign politicians there are saying about this...If someone doesn't like this, let them go down themselves...and then try to put something there. Russia must win. Russia has what it takes to win. The Arctic has always been Russian."xiii

While the US is concerned with maintaining open economic transportation throughout the world's waterways, Russian official policy declares that the Arctic's Northern Sea Route is a "unified transportation link of the Russian Federation." In 2009, they went one step further to announce that they are planning to extract a "fair price" toll to pass through the route. In the following year, official legislation was developed to begin establishing the details of regulation and collection of such tolls.xii

To enforce such ambitious claims, Russia is well-positioned in terms of Arctic capabilities and logistics. They own eight heavy icebreakers, seven of which are nuclear powered, and twenty-three medium icebreakers.[xiv] Of the eleven additional icebreakers in development, Russia has two scheduled to be released within the next couple years.[xv]'xvi Such a fleet of icebreakers is unmatched by any other nation.

To supplement their ability to access Arctic waterways, Russia has also been increasing its military capabilities for the region. Over the last two years, Russia established fourteen new airfields and sixteen new deep water ports; and has activated some of the most advanced surface-to-air missiles in the region. Of the six most recent combat brigades Russia has established, four of them are dedicated to the Arctic.[xvi]More recently, Russia opened their second military base in the region.[xvii] Its official purpose is to maintain control of vessels passing through the Northern Sea Route, protect oil and natural gas resources, and defend against possible attacks by a foreign military.[xviii] Also in production by the Russians are two ice-capable naval vessels which are armed with cruise missiles.[xix] These developments have fulfilled Russian intentions that were announced in 2014, "We will be almost fully prepared to meet unwelcome guests from east and north."[xx]Such extensive capabilities position Russia as the preeminent Arctic power.

Activity within the region has already been heating up. In 2007, Russian bombers entered the 12-mile air defense zone of Alaska at least 18 times.xii In 2014, more than 100 Russian reconnaissance flights were recorded within the Arctic, up from around 33 from the prior year. On the other side of the world, the Colonel General of the Russian Airforce claimed that, "In 2014, more than 140 [US and UK reconnaissance] flights have taken place, compared to 22 flights in 2013."xx Not all reconnaissance flights are hostile, but the increased frequency of occurrences is a clear indication of perceived importance.

Russian activity within the region has reached beyond just research, reconnaissance flights, and transportation. Military exercises have commenced at an advanced level. In January 2015, around 3,000 intelligence officials were sent to a Russian air base within the Arctic to listen in on Western communication channels.xx Two months later, around 45,000 troops, 3,300 vehicles, 41 ships, 15 subs, and 110 aircraft arrived to conduct extensive military exercises.xvi

It is clear that the most powerful Arctic force is flaunting its capabilities. Russia has the best fleet to maneuver across icy Arctic waters. They've established resource development, declared sovereignty over one of the most widely used international Arctic waterways, and has demonstrated its military might. The US Secretary of Defense succinctly described the situation: "The Arctic is key strategic terrain. Russia is taking aggressive steps to increase its presence there."[xxi]

If the **United States** became eager to establish its own **dominance** within the Arctic **region**, it **would** be **unable** to do so. Compared to Russia's 8 active heavy icebreakers, the US has 1; while there are 23 active

Russian medium icebreakers, the US has none.[xxii] We're currently building no icebreakers and there are no options to lease or borrow any icebreakers from "legitimate" partners.xv As the Arctic opens its vast strategic waterways and abundant resources, the US can't **even produce** a series of **navigable routes**.

The **McMurdo** Antarctic Research Center magnifies the need for more US icebreakers. To initiate the resupply process at McMurdo, a heavy icebreaker is required to break the 15 feet of ice that surrounds the research center for 70 miles.xv This only active US heavy icebreaker, at 41 years old, is aging and quite deficient. Compared to the seven Russian nuclear powered icebreakers, the one non-nuclear US icebreaker can spend only four to six days on station before it must return.xii Such a desperate situation has caused some to declare that current scientific observations are not sustainable given the projected funding levels.[xxiii]

The **US Coast Guard** has asked for a minimum of **six icebreakers** that they say are needed for **current operations** (at least three per pole: one deployed, one within training, and one in long term maintenance).xvi'[xxiv] Despite this, the current funding proposal aims to reduce the Coast Guard's budget around the same amount that is required to build one new icebreaker.[xxv]'[xxvi]

The situation is equally as dire when considering the current condition of the US Navy. From a high of 594 ships in the 1980s, the current deployable fleet of the US Navy is only 272 ships.[xxvii]'[xxviii] The official Naval Force Structure Assessment released in 2016 recommended a minimum fleet of 355 ships to cover modern strategic points of interest.[xxix] A 350 ship navy only provides 70 continuously deployed vessels, given that training, transition, and maintenance schedules usually occupy 4/5 of any current fleet. By comparison, the Chinese Navy is estimated to reach 415 naval vessels by 2030.[xxx]

The current production schedules are set to have a total of 308 ships by the end of 2021. Despite the fact that this shipbuilding plan fails to reach the stated needs of the US Navy, current budget proposals fall $4.5 billion short of reaching the lackluster goal.xxvii Not only is the US Navy unprepared to maintain coverage of their identified strategic points of interest, there are no current plans to rectify the situation.

There are extensive proposals to refit and refurbish decommissioned naval vessels to help reach the 350 ship goal. Jerry Hendrix and Robert C. O'Brien's refurbish plan leaves only 22 new ships that would need to hit the production line.[xxxi] Such an extensive refit and refurbish plan would mirror methods used in the 1980s which brought the US Navy to a total of 594 ships. However, there are doubts as to whether this move would be prudent. Technology on decommissioned ships in the 1980s was not far off from the new requirements that were needed to be protected on the open seas. The situation is quite different in 2017. Current decommissioned ships are two, and sometimes three generations, removed from current technology.xxxiv Even if the money was spent to refit and refurbish these ancient vessels, the cost-benefit of such a rebuild program could be seen as unsatisfactory, given that the extended shelf life would be significantly shorter than producing a new vessel.

Other observers would like to fill the ship requirement gap with a multitude of small, simple, less expensive vessels.[xxxii] While there are openwater situations where fleets of small, fast moving vessels are strategically beneficial, this different perspective does not address the lack of traditional ships that the US Navy needs for their strategic priorities. If production commenced for a new, small and fast fleet, it should be in addition to the Navy's current stated needs, not as a replacement.

Reaching such goals will be a challenge given the current financial situation. Due to sequestration imposed upon military spending, the US Navy needs an additional 23% of its current budget to return to normal levels.[xxxiii]Expenses amount to around $10 billion for a carrier, $3 billion each for submarines, $2 billion for a destroyer, and $500 million for the smaller Littoral Combat Ships.[xxxiv]'[xxxv] Estimates average around $138 billion to achieve the 350 ship goal.[xxxvi]'[xxxvii]

Recent budget proposals released by the current administration are not encouraging. Despite the fact that presidential campaign promises included a Pentagon budget of $640 billion, the current proposal for the Pentagon is around $575 billion, only 3% above the prior administration's projected baseline.[xxxviii]'[xxxix] While the US Navy warns of a lack of ships, only 8 were earmarked for funding in the current budget proposal, the same as the prior administration's proposal.[xl] By comparison, China commissioned 18 naval vessels last year. There are rumors of a couple other ships being added to the funding lineup, but nothing yet has been confirmed.xxxv

Beyond fulfilling requirements for current needs, the US Navy is especially unprepared for the opening Arctic waters. There are no active ice-hardened combat ships.[xli] Without ice hardening, some Navy vessels could withstand Arctic conditions in the summer, but only for a few weeks, and only on the outside edges of ice barriers. No vessels without ice hardening reinforcement can trail an icebreaker through a newly carved path. When standard vessels are reinforced with Arctic capable material, their deployable length can be extended from a few weeks up to two months, but many problems and potential damage would remain a concern.xli Refitting ice-hardened protective shells onto existing vessels can cost an additional 33% of what it took to build the ship itself.[xlii]

Building ice-capable ships during production is much easier and cost efficient. Using production methods from Canada, Norway, and Denmark (which maintains sovereignty over Greenland), it has been estimated that an ice-capable Destroyer could be built with only 84% of current production expenses.[xliii] Preparing our Navy for Arctic conditions isn't a matter of ability; it is a matter of clearly and persuasively communicating national priorities.

It is not enough to remain hopeful that dwindling ice during the Arctic's summer season will allow **scientific research**, **economic transport**, and military might to flow freely through the **Arctic's northern waters**. Free movement of vessels cannot be regulated to **small seasonal windows**. Winter will come. Should an international conflict arise in the Arctic, it will not be a chivalric standoff which occurs a few weeks out of the year. It will be a year round conflict; one which favors those who are prepared to maneuver and operate throughout the thick and unrelenting ice.

The Constitutional blueprint for the US Federal Government reveals within its first few lines that the national priorities are to "provide for the common defense", but only to "promote the general welfare".[xliv] With the multitude of requests for federal funding, that founding document should be a continual reminder that national defense preparedness is a unique imperative of the federal government.

Investing in at least **six new** **nuclear powered icebreakers**, allocating funding and production schedules for a 350 ship Navy, and announcing intentions to maintain clear passages for international commercial waterways within the Arctic should be of **paramount importance** for the United States. **Such efforts** would not be an **unnecessary escalation** of **tensions within the Arctic**. It would only be rectifying the years of neglect and foolish policy that has prevented the **US** from **protecting** the **vital resources** and **economic activity** within its sphere. The changing Arctic waters reveal strategic vulnerabilities that had once been below the radar, but now, cannot be ignored.

Scenario 1: Climate Change/ Green Tech

Utilizing new reserves of critical minerals from the Arctic, such as rare earth elements, is necessary for the transition towards green technology.

Mads Qvist **Frederiksen 23**. Executive director of the Arctic Economic Council. "If we want an energy transition, we must have more mining." Arctic Economic Council. 3-13-2023. https://arcticeconomiccouncil.com/news/if-we-want-an-energy-transition-we-must-have-more-mining/

The **demand** for **raw materials** is expected to increase by 500% between now and 2050, according to the World Bank, due to the energy transition that the world is going through.

There was a watershed moment in history when the earth was first "turned inside out" and humans started to exploit the raw materials that make up the primordial foundation of our planet. Today we once again look underground for the solutions to our challenges.

In the **Arctic region**, we can find **many** of the **metals** and **minerals** needed for the **green transition**. On January 12th 2023, the Swedish mining company LKAB announced that around 700 meters below the ground, they had discovered the largest known deposit of rare earth elements in Europe – a raw material that is it is critical for our transition to new, green technologies but is not currently being mined in Europe.

All across the Arctic, the local communities have for centuries been involved in the mining sector. The region has been mined throughout history to attain the building blocks for a more modern and developed civilisation globally. Yet, people's understanding of the importance of mining has decreased over time as new mines have been placed in remote and distant locations with different regulatory frameworks than in the Arctic. However, now the world needs Arctic mining again because the region has many of the raw materials needed in the green transition and in places with fair and transparent jurisdictions.

Politicians are awaking to the need of mining for a clean and greener future

In early March 2023, the European Union (EU) published their new Critical Raw Materials (CRM) Act. It may not have made a lot of headlines around the world, but it is important for industries, remote Arctic communities, and the wider population.

The president of the European Commission Ursula de Leyden highlighted the importance of mining at the beginning of the year when she said:

"The economies of the future will no longer rely on oil and coal, but on lithium for batteries; on **silicon metal** for chips; on **rare earth permanent magnets** for **electric vehicles** and **wind** turbines. And it is sure: the **green** and **digital transitions** will **massively increase** our **need for these materials**."

Some analysts even argue that the opening of the first EU office in Nuuk, Greenland is related to Europe waking up to its need for new sources of raw materials.

Simultaneously in the US, President Biden earlier announced an increase in the development of green technologies. The new Inflation Reduction Act (IRA) also includes large tax breaks for mining companies that can produce the required critical raw materials. Last year, the US also launched a $30 million initiative to research and secure the supply chain of domestic raw materials.

Both the EU and the USA have recognised that they risk simply replacing fossil fuel dependency to mineral dependency from authoritarian states if they don't act now.

China – who today is processing most of the world's raw materials and thus holds a competitive advantage, is also moving into new mining regions such as Madagascar and deep-sea mining off the coast of Mozambique. Some Chinese companies have also shown an interest in mining projects throughout the Arctic region.

Mining has become an **issue** of **security** but it is also just as much about the future of **planetary health**; the unavoidable fact is that our sustainable future begins deep underground in a mine. Yet, there were no references to mining in the most recent report of the International Panel on Climate Change (IPCC).

We cannot afford to slow down with **mining**. It is clear that we are going to need a vast amount of **green energy** in the future, and for that, we will need a vast amount of **critical minerals**.

In the coming two decades, we will require a 500% increase in the production of lithium and graphite in order to meet demand. Some people estimate that our activity will necessitate the opening of more than 330 new mines in the near future, and with one mine normally taking more than 15 years to become operational, we have no time to waste.

We need to invest more in new mining projects

Today's **mineral supply** and investment plans fall short of what is needed to transform our **energy sector**. A growing and more resource-hungry population means larger quantities of CO2 emissions unless we are able to change our basic technologies.

If you want to build a battery to store energy, you need lithium, nickel, cobalt, manganese, and graphite to ensure high performance, longevity and, energy density.

If you want to expand your electricity network, you need copper and aluminium.

If you want to build permanent magnets that are used in wind turbines and electric vehicles, you need rare earth elements.

In 2019, Finnish geologist Simon Michaux estimated that the world has to increase the production of several raw materials several times, above all total historical production to date, to reach our climate ambitions. Therefore recycling will not take us all the way.

A typical electric car requires six times more mineral inputs than a conventional car, and an onshore wind turbine requires nine times more minerals than a gas-fired plant of the same capacity. Since 2010, the average amount of minerals required for a new unit of power generation capacity has increased by 50%.

It is also the critical raw materials which we need in our satellites, computers, and **connectivity infrastructure**. The defence industry also needs the minerals that we are currently **sourcing** from **authoritarian states**. Each F-35 jet contains more than 400 kilos of yttrium, terbium, and other rare earth elements. Nuclear reactors and lasers use samarium, missile guidance systems need neodymium, night vision goggles need lanthanum, etc. In the autumn of 2022, the Pentagon temporarily halted deliveries of F-35 jets after discovering that the raw materials used for a magnet had been made with a cobalt and samarium alloy from China. As such, they had to find a place closer to home in their supply chain. Today, the majority of rare earth mining, refining, and processing takes place in China.

In 2010, China and Japan entered a trade dispute when the former suddenly halted all shipments of rare earth elements to Japan. The dispute began when the Chinese government reduced its export quotas by 40% which resulted in import prices rising quickly. China argued that this decision was made to protect the environment, but the West called it protectionism in disguise. The dispute was later resolved in the WTO, but it caused western governments to begin looking outside of China for rare earth elements.

For the climate, for security, and for jobs

As we can see, we must diversify our **raw materials** supply and develop mining operations in **new places**, instead of outsourcing to developing countries. The **Arctic region** contains **many** of the **minerals** that are currently mined elsewhere, even though the **quality** of the **ore** could **possibly be better in the north.**

We cannot get anywhere close to the quantity of required raw materials in a sustainable manner unless developed countries are also pursuing mining opportunities.

The good news is that there is growing consumer demand for more supply chain transparency, tighter environmental regulations, and labour rights. This, combined with the strategic importance, may lead to more mining in the Arctic. The first obstacle to overcome is the idea of "NIMBY – not in my backyard" or "Green colonialism" which some interest groups are promoting. Some of the interest groups don't even live in the front yard of the Arctic but believe that the region should be kept separate from wider global development.

I believe that when presented with the options of where and how mining takes place today, and how it **could take place** in the **Arctic**, this information could bring more people together. Local communities ultimately benefit from having a mine close-by. They create new jobs and the supply and demand for supporting services. In some parts of the Arctic, it is the mining companies that construct and develop the infrastructure to improve the lives in the north. For example, through investment in schools and renewable energy.

It was the demand for metal that drove industrialization from approximately 1700 to 1900, followed by the demand of new infrastructure and two world wars which led to the development of modern materials. Subsequently, the growth of big science and high-tech, combined with the rise of China from early 2000 has resulted in not only an exponential increase in energy demand but also in the demand for minerals.

The production of copper, zinc and steel has escalated drastically in the past 50 years. By 2030, the 20 million project EV charging points, that are anticipated globally, will consume 250% more copper than produced today. Wood Mackenzie estimated in 2022 that 9.7 million tonnes (Mt) of new copper supply is needed over 10 years from projects yet to be sanctioned, equivalent to nearly a third of current refined consumption, if industry is to meet the Paris Climate Agreement targets. They also estimate that more than US$23 billion a year will be called for over 30 years, to deliver new projects under an accelerated energy transition scenario.

According to World Bank study from 2017, we need to increase our production of nickel by 100%, indium by **more than 200%**, and **cobalt**, **lithium** and **graphite** by more than 450% no later than 2050 in order to reach our climate targets.

The challenge is now that we have mined our way through history, so the quality – or the grade – of the minerals is getting worse at the surface. We must dig deeper to retrieve useful material. We must also use new and innovative methods to find “hidden” or “blind” deposits.

Another challenge we face is that 50 years we did not mine for many of these critical minerals and as such some rocks containing key materials were not processed correctly and ended up in tailings piles. Consequently, our understanding of, and current mining practices around these metals, is poor in comparison to others. Therefore we need to increase exploration for these critical raw materials. This is where the Arctic region can come in to help.

The Arctic got the opportunities to be a prime area for mining

The solution to the supply problem is relatively straightforward. We can either mine more, recycle better, or massively reduce our consumption. The main challenge with the latter solution is that many of the elements used in modern devices were not used in older products. And that the amounts we need are greater than historically mined. For just copper, we use four times more of it in an electric car than in an internal combustion engine.

Therefore, we need to mine.

There is a saying, when is the right time to plant a tree? The answer is yesterday, but when is the second-best time? And the answer is today. The same goes for mining. We should have started to invest a long time ago but we can still make it if we start today.

First the good news, we don’t lack the raw materials. In fact, for example, the so-called rare earth **elements** are not **very rare at all**. What we lack is **robust finance** for **mining**, quicker permitting, and customers who are willing to pay a premium for more responsible mining.

While mining activities have been undertaken for thousands of years, the **mining** industry in the Arctic is moving towards **maximum benefits** with **minimum impact.** Whilst **mining** by its nature is not sustainable, it can be responsible. The **latest technologies** in **mining** can help to mitigate and minimize **environmental** and **societal impacts**.

Some of the main obstacles facing mining are the absolutist anti-mining positions taken by some interest groups and well-meaning forces in the developed world. However, these harsh line policies can often result in the opposite outcome in regard to biodiversity and global impact. As without support we instead experience a “mining leakage” where the projects don’t disappear but are instead shifted to faraway places. Mines are shifted from nations with benign practices, strict human rights, and environmental regulations to regions with less stringent social and environmental policies.

The Arctic is key. It can meet a quarter of global demand for critical minerals needed for green tech.

Madeleine **Cuff 25**. Environment reporter at New Scientist. "Will climate change lead to an industrial boom in the Arctic?." New Scientist. 4-22-2025. https://archive.ph/OAAIB

The Arctic is warming almost four times faster than the global average, transforming the frozen landscape at an astonishing rate. While devastating for wildlife and communities that live there, governments and businesses spy an opportunity.

The **region is rich in resources**, including untapped fossil fuel reserves and **critical minerals necessary** for the **energy transition**. Arctic nations have jostled for control of these **resources** for **decades**, and **some exploitation** – mostly fossil fuel extraction in the Russian Arctic – is already underway.

By the end of the decade, the Arctic Ocean could be ice-free during the summer, allowing ships to journey directly over the North Pole for the first time. This rapid melt is making the region more accessible than ever, fuelling expectations of fast industrial growth in the Arctic. Since taking office in January, US President Donald Trump has loudly declared his desire to take over Greenland, a Danish territory, as well as Canada. But will climate change really deliver an Arctic industrial boom?

There is no doubt the region harbours **valuable resources**, including about 90 billion barrels' worth of oil and about 30 per cent of the world's undiscovered natural gas reserves, according to a 2012 assessment by the US Geological Survey.

Rare earth minerals are also **plentiful**. Greenland alone is thought to have enough reserves of metals such as **neodymium** and **dysprosium**, which are used in the manufacture of **wind turbines** and **EVs**, to meet at **least a quarter** of future **global demand**. It also boasts significant quantities of **cobalt**, **copper**, **graphite** and **nickel**.

Demand for these **materials** is rising **rapidly** around the world as the **energy transition gathers pace**. China now dominates global supply chains, with other regions – **most notably Europe** – racing to **secure alternative supplies.**

"There is increased interest from mining companies, multinational mining companies, for exploring and mapping the deposits in the Arctic, due to the need for particularly **critical raw materials** in **Europe.**" says Anne Merrild at Aalborg University in Denmark.

Accelerating the use of green technology is necessary to address climate change by reducing greenhouse gas emissions.

Ahmed I. **Osman 22**. **Research Fellow at Queen's University Belfast, Distinguished Editor at Environmental Chemistry Letters. **Lin Chen, School of Civil Engineering at Chongqing University. **Minqyu Yang. **Goodluck Msigwa. **Mohamed Farghali. **Samer Fwzy. **David W. Rooney. **Pow-Seng Yap. "Cost, Environmental impact, and Resilience of Renewable Energy Under a Changing Climate: A Review." October 2022. https://link-springer-com.proxy.library.emory.edu/article/10.1007/s10311-022-01532-8

Almost 80% of the global population lives in countries that are net importers of fossil fuels (IRENAd, 2022). Due to their dependence on foreign fossil fuels, approximately six billion people are vulnerable to geopolitical **shocks and crises** (AaH et al., 2021). In contrast, renewable energy sources are available in all nations, but their **full potential has yet to be realized.** The International Renewable Energy Agency (IRENA) estimates that by 2050, 90% of the world's energy can and should come from renewable sources (IRENAb, 2018).

In addition, the excessive use of fossil fuels and nonrenewable energy sources contributes to global warming by emitting large quantities of greenhouse gases (Chen et al., 2022a). Controlling greenhouse gas emissions from energy production and consumption is **crucial** to **combating climate change**. To achieve the Paris Agreement's goal of limiting global temperature rise to 1.5 °C–2 °C by 2100, energy systems require **rapid**, **immediate**, and **sustained innovation** and the **effective use of renewable energy** across all sectors (Fawzy et al., 2020). The demand and growth of renewable energy in the transportation, buildings, industrial, and power sectors are summarized in Table 1 based on the critical energy use sectors identifed by the IRENA.

The **urgency** to **combat climate change** and achieve **sustainable development** strengthens the global renewable **energy transition** momentum in an era of global environmental degradation. A **sustainable energy future** is **within reach** due to the development of **green buildings**, **green energy** and **power use** in **industry**, green **transportation**, decreased costs of **renewable energy**, increased energy efficiency and continued **technological**

advancements, and informed policymaking. This shift is gaining traction, but it **must accelerate** to contribute to global sustainable development. According to the development and research on the use of renewable energy in critical sectors (Table 1), the building sector accounts for 70% of the Kingdom of Saudi Arabia's energy consumption. In order to sustain the construction industry, renewable energy is essential. However, the development of renewable energy is hindered by policies, finances, technology, and culture. In addition, India's urgent need for policies promoting the use of renewable energy in the construction industry was demonstrated. According to studies, using renewable energy in the industrial sector can **save money** and **protect the environment** from the dangers of fossil fuel emissions. However, government level awareness campaigns regarding the significance of energy conservation are required.

Climate change causes extinction.

Henry H. **Willis et al 24**. Associate Director, Meselson Center; Senior Policy Researcher; Professor of Policy Analysis, RAND School of Public Policy; Anu Narayanan, Associate Director, RAND National Security Research Division; Benjamin Boudreaux, Policy Researcher; Bianca Espinosa, Edward Geist, Policy Researcher; Daniel M. Gerstein, Senior Policy Researcher; Dahlia Anne Goldfeld, Senior Information Scientist; Nidhi Kalra, Senior Information Scientist; Tom Latourrette, Senior Physical Scientist; & Emily Lathrop. "Assessing Global Catastrophic and Existential Risks." Rand Homeland Security Research Division. 10-30-2024. https://www.rand.org/pubs/research_reports/RRA2981-1.html

Summary

Decades of **scientific investigation** convey **high confidence** that **human-induced** changes in the **climate system**, largely associated with past and future **emissions** of **GHGs**, are already having significant **adverse effects** on the **environment** and, by **extension, human well-being**. These effects are projected to continue to manifest across a range of geographic scales (local to global) and economic sectors. Effects will grow in **frequency**, **intensity**, and **duration** in **response** to increases in future **global average temperature**. However, what constitutes a global catastrophic risk in the context of climate change is poorly defined and contested. Scientific studies to date indicate a low, but not zero, probability that the magnitudes of **climate change** currently projected to occur by **2050** or **2100** constitute a **global threat** to **civilization** or **continued human existence**. However, catastrophic outcomes and even **existential losses** of some **human populations**, **ecosystems**, and biodiversity at local to regional scales **are likely**, particularly in the absence of risk management interventions.

From the assessment presented in this chapter, we see four key pathways by which **climate change** could trigger **global catastrophe**:

• rapid acceleration in the use of **fossil fuel production** and **use**: This could make **more-pessimistic scenarios** of **future emissions likelier**, thus increasing the likelihood of Earth **reaching magnitudes** of **global warming consistent** with more-**catastrophic outcomes**.

• the Earth system's increased **sensitivity** to **changes in climate**: Although current estimates put the world on track for 2 to 3°C of warming by 2100 under current policy trajectories, **positive feedback** could push the **world** to **higher levels of warming**.

• reductions in thresholds for key risks in the Earth system: In the event that large-scale discontinuities in the Earth system, such as the collapse of ice sheets or major ecosystems, are triggered by lower magnitudes of warming than currently estimated, the risk of global catastrophic outcomes would increase.

• cascading and compounded risks: Climate change's ability to trigger complex consequences that are not captured in existing, reductionist studies could result in **surprise catastrophic events** or **contribute** to **other types** of **existential threats**, such as **global pandemics**.

Scenario 2: Energy Security

And, Arctic resource development solves energy security.

Sydney **Murkins 24**. United States Marine and Foreign Area Officer who is currently based out of the U.S. Embassy, Oslo. She is a Norwegian speaker and holds a Master of Arts in Security Studies (Europe and Eurasia) from Naval Postgraduate School. "The Future Battlefield is Melting: An Argument for Why the U.S. Must Adopt a More Proactive Arctic Strategy." Arctic Institute - Center for Circumpolar Security Studies. 12-3-2024. https://www.thearcticinstitute.org/future-battlefield-melting-argument-us-must-adopt-more-proactive-arctic-strategy/

As part of the **US's proactive** Arctic Strategy, Washington should prioritize economic investments in companies owned by NATO members. Through these investments, **energy security** within **NATO** can be **improved**, and the nations can **decrease** their **dependence** on **rare earth materials** from China. The United States has already taken initial steps to secure **critical mineral** and **clean energy supply chains**, but more can be done. In September 2024, the United States signed a Critical Minerals Agreement with Norway, demonstrating both countries' commitment to working together to ensure energy security.31) Another such opportunity for the U.S. to further support its Nordic Allies exists in Sweden. In 2024 the Swedish mining company LKAP discovered Europe's largest deposit of rare earth elements in the northern city of Kiruna, Sweden. Norway and Sweden have already begun collaborating to increase energy security through the Norwegian company, REETec, which has developed technology to separate rare earth metals that competes with China's production of these materials.32) According to the CEO of LKAB, Jan Moström, this cooperation provides the foundation to develop a "strong and sustainable Nordic value chain for rare earth metals."33) A proactive U.S. Arctic Strategy that takes into consideration increased **NATO energy security** through **Nordic investment** further bolsters the United States' ability to decrease **dependence** on **China** and **should be pursued**.

Energy security solves extinction.

Alex **Holstein 20**. Managing Partner at Holstein-Gray, M.Sc. in Russian and Post-Soviet Studies from the London School of Economics. "Invisible Warfare: NATO and the Geopolitical Storm on the Market Economy Horizon." https://www.geopoliticalmonitor.com/invisible-warfare-nato-and-the-geopolitical-storm-on-the-market-economy-horizon/.

But before we even get to that very worst of the worst-case scenarios of a direct collision between a NATO ally and Russia, even the **slightest escalation** in the region, considering its vital **energy resources**, could have a **devastating impact** on global markets, which in itself would kick off a **wave of instability** and eventual **warfare**. As market economies evolve and integrate by engaging commerce and leveraging technology, the blend between national security and socio-economic imperatives becomes **even more prescient**. This carries with it both advantages and disadvantages. Traditionally, NATO military forces have relied on critical civilian infrastructure such as communications, food and water, industrial capacity, civil transport and energy supplies to conduct operations. The additional rise of non-kinetic asymmetric threats – cyberwarfare, information warfare, EMP attack – against non-traditional targets, such as banks or major multinational corporations that comprise key components of this critical infrastructure, adds an entirely new dimension to the defense requirements of the 21st century. In addition to dealing with more conventional kinetic threats from traditional and emerging adversaries, NATO must prepare itself for this new era of invisible warfare through deeper strategic cooperation with the private sector and corporate entities. Great Powers and non-state actors alike

can now conduct non-kinetic attacks **just as devastating** as any **nuclear, biological** or **chemical WMD**, resulting in **millions of deaths** and the **mass breakdown of societies**, while in turn **undermining** the doctrine of **M**utually **A**ssured **D**estruction and other deterrents against **nuclear war**. But even **contained instability** within specific regions could still **disrupt markets** on a **global scale**, whether **directly targeting infrastructure** or as a **knock-on effect** of a conventional engagement, as in the case of Nargono-Karabakh and the threat to Europe's energy supplies. A European **energy crisis alone** could prove the tipping point toward a **wider war**, or a **societal breakdown**, without a **single shot fired**.

2AC/ Affirmative Extensions

Inherency/ Solvency Extensions

Sustained focus on icebreakers is necessary to actualize federal investments in shipbuilding.

Malte **Humpert 25**. Senior Fellow and Founder of The Arctic Institute. "Polar Icebreakers May Be Key to Jumpstarting American Shipbuilding, New Report Finds." gCaptain. 3-18-2025. https://gcaptain.com/polar-icebreakers-may-be-key-to-jumpstarting-american-shipbuilding-new-report-finds/

Thus far **procurement** and lead-up to construction of the Polar Security Cutter, as the Coast Guard's **new heavy icebreaker** is called, has been **anything but smooth**, with more than half a decade passing from contract signing to the first steel being cut.

But a **clear signal** from the **U.S. government** for the **procurement** of a **fleet** of **icebreakers** in the **present can help put American shipyards** in a position to participate in the market for a growing **global demand** of **icebreakers** – estimated between **70-90 – in the future**. And in the medium-term that new expertise could translate to **competing** for **international** military and **commercial dual-purpose vessels.**

President Trump recently stated that the U.S. will be looking to order 40 big icebreakers for the Coast Guard. **Even** a firm **commitment** and **funding** for a fraction of this **lofty goal** would send a **key signal**.

"**Sustained U.S. government focus** on the **production** of **vessels** like **icebreakers**, undersea construction vessels, unmanned underwater vehicles, and undersea cable and repair ships remains the **clearest route** to putting near-term '**points on-the-board**," the Wilson Center report highlights.

"The **best tool** we have today to **strengthen** the **shipbuilding industrial base** in America **is procurement**, but we also need new government investment, adjustment to trade policy, and changes in labor policy. We need to force military service branches to think about industrial policy — not just following bureaucratic procedures to put warships on the water," Henagan concludes.

That spills over to re-establish America's reputation as a premier shipbuilder.

Elías **Thorsson 25**. Writer and marketing specialist at Arctic Today. "Can new US icebreakers help break China's shipbuilding dominance?." ArcticToday. 3-14-2025.

https://www.arctictoday.com/can-new-u-s-icebreakers-help-break-chinas-shipbuilding-dominance/

Why icebreakers?

The Wilson Center argues that **icebreakers** are a **critical starting point** for reviving U.S. **shipbuilding**. While the U.S. has only a handful of operational icebreakers, Russia has over 40 in service, and China continues expanding its polar fleet.

Beyond military needs, **global demand** for **icebreakers** is **growing**, with U.S. allies projected to purchase between **70 and 90 icebreakers** in the next decade. If U.S. shipyards can **scale up production** and **compete internationally**, they could **break** into a growing **market** and **re-establish America's reputation** as a **global shipbuilder**.

The ICE Pact, a trilateral initiative with Finland and Canada, is designed to help U.S. shipyards enter this market while strengthening Arctic security. If successful, it could serve as a model for **larger-scale** U.S. **shipbuilding reforms**.

A call to action

The Wilson Center's report presents a stark warning: Without urgent reforms, the U.S. will continue to fall further **behind** in **shipbuilding capacity**, **industrial competitiveness** and **Arctic security**.

By developing a national shipbuilding strategy, modernizing acquisition rules, and implementing stronger trade protections, the U.S. can rebuild its maritime power and compete with China's state-backed shipbuilding dominance.

AT: ICE Pact Solves

The ICE Pact fails to rebuild shipbuilding.

Kent E. **Calder 25**. Directs the Edwin O. Reischauer Center for East Asian Studies at the Johns Hopkins School of Advanced International Studies (SAIS). "As global players focus on the Arctic, US icebreakers are scarce." Asia Times. 4-30-2025. https://asiatimes.com/2025/04/as-global-players-focus-on-the-arctic-us-icebreakers-are-scarce/#

Most importantly, the US has **failed** to **build up** its **domestic icebreaker capacity**, nor has it begun developing related naval capabilities that would allow it to actively contest and contain the rapid Russian and Chinese buildup along the Arctic sea lanes.

And it has done remarkably little, until lately, to support its friends in the Arctic with respect to infrastructure investment support. The US, for example, has no Arctic deepwater ports to host heavy container ships. Canada has only one, lying 500 miles south of the Arctic Circle.

Even though Russia now has over 40 icebreakers, **several of nuclear-powered**, and an active building program, the United States presently lacks even a single heavy or **medium-duty icebreaker** active in the **Arctic**. US icebreaker capacity, such as it is, is concentrated entirely in the Great Lakes.

The July, **2024 ICE agreement** with Canada and Finland, concluded at the 2024 Washington NATO summit, does **begin to address** the **icebreaker** crisis in **multilateral fashion**. Yet the **massive deficiency** in America's own icebreaker capacity, rooted in the **striking weaknesses** of its own **domestic shipbuilding industry**, **still remains**.

In the emerging game of Arctic maritime geopolitics, too many of the high cards still ominously lie in Russian and Chinese hands.

AT: There are Icebreakers Now

There's interest but not funding.

Malte **Humpert 25**. Senior Fellow and Founder of The Arctic Institute. "US Coast Guard Seeking Information To Fast-Track Icebreaker Construction To Just 36 months." gCaptain. 4-15-2025. https://gcaptain.com/us-coast-guard-seeking-information-to-fast-track-icebreaker-construction-to-just-36-months/

In addition, **last week's Executive Order** to strengthen the U.S. maritime sector also prominently featured **mention** of the **Arctic region**. The EO called for the development of a strategy to "secure Arctic waterways."

It **remains** to be seen if this increase in policy interest translates into concrete **budgetary investments** to **enhance** the **USCG's Arctic capabilities**. Thus **far only a single heavy icebreaker**, also known as the Polar Security Cutter, currently under construction at Bollinger Shipyards in Mississippi, **has been fully funded**. The vessel's construction from first steel cutting in 2023 to completion will likely take 7-8 years.

Military Power Advantage Extensions

Only nuclear icebreakers can expand the range of missile defense.

Milosz **Reterski 14**. Graduate student at the Center for Global Affairs at New York University. "Breaking the Ice: Why the United States Needs Nuclear-Powered Icebreakers." Foreign Affairs. 12-11-2014. https://archive.ph/J2ykq

Nuclear-powered icebreakers would also **extend** the **Arctic reach** of the **Aegis fleet**—**U.S. Navy cruisers** and **destroyers capable** of **ballistic missile defense**. The fleet must be able to quickly travel to any **theater** of **operations**, especially in light of the growing **ballistic missile threat** posed by **China**, **Iran**, **North Korea**, and **Russia**. Right now, Aegis cruisers can sustain only limited operations north of the Arctic Circle, but a U.S. Navy **nuclear icebreaker** would allow a **true forward presence.**

Positioning missile defense in the Arctic is key to broader effectiveness.

Debalina **Ghoshal 23**. Independent consultant in nuclear, missile, and missile defense relate issues. "A Look at Defense Competition in the Arctic Region." Defense.info. 12-15-2023. https://defense.info/re-thinking-strategy/2023/12/a-look-at-defense-competition-in-the-arctic-region/

For the United States, the Arctic remains **strategically relevant** for **homeland missile defense capabilities**. It hosts a greater part of the U.S. **missile defense** architecture **meant** for **homeland defense**. **Alaska**, the region that makes the United States an Arctic country, is referred to as "**the most strategic place on earth**."[19] In 2021, the United States completed construction of Long Range Discrimination Radar (LRDR) that would help track and defend against long range ICBMs and hypersonic weapons [20] **forming the backbone** of US layered **missile defense** to **protect** its homeland.[21]

In addition, the United States is also working on Next Generation Interceptors (NGI) to replace the existing Ground Based Interceptors (GBIs) which had myriad limitations. The interceptor would need to counter enemy missiles as well as counter measures fitted on missiles as well as counter high speed missile systems.

Hence, LRDR could complement the NGIs. There are also recommendations to retain the GBIs also in Alaska owing to the North Korean missile threats as the GBIs are undergoing Life Extension Program (LEP). [22] In the **near future**, the United States could also **consider deploying** the **Aegis Ashore system** with **advanced interceptors** in the **Arctic** along with existing GBIs till the NGIs becomes a success story.

That solves global nuclear war.

Matthew **Costlow 23**. and Robert Soofer. Senior Analyst, National Institute for Public Policy, Ph.D. Candidate, George Mason; Senior Fellow, Atlantic Council's Scowcroft Center for Strategy and Security; Atlantic Council, "US Homeland Missile Defense: Room for Expanded Roles," https://www.atlanticcouncil.org/wp-content/uploads/2023/11/Costlow-Soofer-Homeland-Missile-Defense.pdf

COUNTERING COERCIVE ATTACKS FROM CHINA AND RUSSIA

Even as the United States adapts to the dynamic **No**rth **Ko**rean ICBM threat, **China** and **Russia** are building the **missile**-based **forces** necessary to **threaten the US** homeland at or **below** the **nuc**lear **threshold** to **enable** their strategies of **coercion** and theories of military **victory**. Since the United States has eschewed developing homeland missile defenses of any kind designed to defeat Chinese or Russian missile threats (except for a limited cruise missile defense of the national capital region), China and Russia appear to view this **perceived vulnerability** as an opportunity to successfully deter, **coerce**, or ultimately **defeat US** efforts to project **power** overseas.

According to some US experts, "Moscow and Beijing appear now to calculate that their respective threats to escalate to limited nuclear war will be sufficient to paralyze direct US opposition to their regional expansionism."16 This may include dual-use capabilities to attack the foundation of the US national defense strategy: power projection from the homeland. The "2022 Nuclear Posture Review" recognizes this problem, stating that the United States must prepare to deter large-scale and limited nuclear use from its nuclear-armed adversaries, especially in light of the increasing reliance on the coercive threat of limited nuclear use in these states' strategies.17 More recently, Lt. Gen. Gregory Guillot, nominated to be the new commander of US Northern Command, told Congress in July that the Defense Department should consider expanding current national missile defense policy to also counter coercive attacks on the United States by China or Russia.18 There appears to be growing support for this approach, as the bipartisan US Strategic Posture Commission reached consensus recently and recommended that the "United States should develop and field homeland [integrated air and missile defense] capabilities that can deter and defeat coercive attacks by Russia and China."19

Deterring **coercive nuc**lear strikes or **conventional strikes** with strategic effects against the homeland **requires** a combination of appropriate conventional forces, nuclear forces, and **m**issile **d**efenses. The missile defense review (MDR) of 2022 notes that **regional** missile **defenses** can help the **U**nited **S**tates deter or defend against **limited nuc**lear **use** by effectively making the **risks** and potential **costs** of smaller-scale nuclear coercion appear **unacceptable**; there is no reason this concept cannot also extend to the defense of the homeland.20 While China or Russia could, in theory, simply overwhelm a US homeland missile defense system designed to defend against coercive attacks, the **larger** the **attack** size needed to overcome US defenses, the **more China** or **Russia** run the risk that the **U**nited **S**tates **perceives** the motivations behind the **attack** as **unlimited** and **responds accordingly**. Additionally, the larger the attack size needed to overcome US homeland missile defenses, the better the chance the United States could detect attack preparations and take the appropriate measures to improve its defense posture.

Given the sheer variety of Chinese and Russia missile **delivery systems** (**cruise**, ballistic, **hypersonic** glide vehicles, fractional **orbital** systems, and other potential combinations), the question naturally is: **what** kind of US homeland **missile defenses** are most **needed** to deter and defeat

coercive threats? If one of the US objectives is to be able to intercept a handful of Chinese or Russian ballistic missiles, then the current **homeland defense** architecture could **potentially** be **sufficient if** it is **upgraded** to address their more sophisticated reentry vehicles armed with decoys and countermeasures. To address these countermeasures, the Department of Defense must improve the tracking and discriminating of warheads, likely from space. If the GBI/NGI can sense Russian and Chinese reentry vehicles and distinguish them from decoys, with the help of space-based sensors, then it may have a reasonably good chance to complete the intercept, even against these more sophisticated targets.

Resources Advantage Extensions

AT: Minerals Not Key

Exploiting every source of minerals is key to make the energy transition happen in the short term.

Andrea **Willige 25**. Senior Writer. "What are the critical minerals for the energy transition – and where can they be found?." World Economic Forum. 5-13-2025. https://www.weforum.org/stories/2025/05/critical-minerals-energy-transition-supply-chain-challenges/

What are critical minerals, and why are they important?

Although definitions vary, there are a large number of critical minerals and rare earth elements that are important to the energy transition. Sometimes they are referred to as “critical materials”, extending to metals like aluminium and other substances.

The US Department of Energy lists a total of 50 critical minerals, while the European Union focuses on 34. The IEA’s list of the most widely used ones includes lithium, nickel, cobalt manganese and graphite, which are typically used in batteries. Aluminium and copper are vital for electricity networks, and rare earths are used for magnets in wind turbines and electric car motors.

Some, like platinum, iridium and palladium are among the rarest elements on Earth, while others like aluminium and silicon, are among the most abundant elements on Earth.

However, just because they are **abundant** does not mean they are **easy to access**. For example, while copper is not a rare element, the typical lead time for a new mine to start delivering copper to the market is about 20 years, according to the International Renewable Energy Agency (IRENA).

That’s why recycling will be a vital requirement for ensuring enough of those critical resources are available. The more of a material can be recycled, the **less rare** it is going to **become**. What is more, **recycling** will **reduce** the need to **extract more** and more from the **ground**.

However, IRENA has pointed out that as demand for critical minerals and materials has increased rapidly, current recycling technology and infrastructure are still lagging. Until recycling can play a bigger role, we still **depend** heavily on **traditional extraction** and the **associated value chain**. The question of where **we source** critical minerals therefore remains **vital** for **securing future supply chains** as **demand** grows.

AT: Nuclear Not Key

Conventional icebreakers fail at extracting resources.

Georgy **Zerkalov 16**. Project Coordinator at Hydraulics LLC, M.S. Candidate in Chemical Engineering. "The Nuclear Powered Icebreakers." Stanford University. 3-12-2016. http://large.stanford.edu/courses/2016/ph241/zerkalov2/

Introduction

It is believed that the **Arctic North** of Russia contains approximately a quarter of the **world's oil reserves**. The **extraction** of this **reserves** is a tough goal due to severe Arctic conditions such as **extreme weather** and **thick ice crusts**, which hinder the transportation of black gold to the refineries. While the extraction of oil from that zone is only projected in the future, the Northern Sea Route (Fig. 1) is currently actively used by ships for scientific expedition and transportation of goods. The only way to **navigate** through six to **ten foot thick ice** is to use **powerful icebreakers** that can smash it and **clear the path** for **other ships**. While there is a number of **conventional diesel powered icebreakers** used around the world, these **do not provide enough power** to be able to **crush thicker ice** and require frequent **refueling** which makes them inconvenient for **long periods** of **continuous operation**. [1] The nuclear icebreakers are designed to solve these issues and provide a number of advantages compared to the diesel powered icebreaker. The only country that has been making and using nuclear **powered icebreakers** is **Russia** (and USSR in the past). [2] So far, Russia has built nine nuclear-powered ice-breakers, six of which are currently in operation.

How It Works

Icebreakers have very smooth shaped bows, as opposed to pointed bows used by regular ships designed to slice the waves and add stability in open waters. When the icebreaker smashes ice the smooth bow hits the ice first from the above and causes it to break under the massive weight of the ship (Fig. 2). [3] The hull of the icebreaker is reinforced and coated with low- friction compounds to facilitate gliding over ice. Furthermore, the hull is designed push the crushed ice away from the ship to keep the propulsion system safe.

The heart of the ship contains a small nuclear reactor to generate heat which is **converted** into **mechanical energy**. [2] The reactor can provide power up to 60 megawatts which is enough to get through 8-10 feet thick ice at speed up to 10 knots (12 mph). The reactor uses nuclear fuel such as highly enriched uranium or uranium-zirconium to boil water that then rotates the turbine which, in turn, powers the turbo electric drive system. The latter spins the propeller. [4]

Advantages and Disadvantages

Nuclear-powered icebreakers are **much more powerful** than **diesel icebreaker.** That enables them **propel through** very **thick crust of ice** at relatively fast speed as **mentioned before**. The fuel demands of this task using any other source of fuel (such as diesel) would be enormous: approximately 90 metric tons of fuel a day compared to just one pound of **uranium at full power** (for "50 years of Victory" icebreaker). The **icebreakers** are **usually refueled** once **every 5-7 years**. [2] This provides an **enormous cost advantage** as well as convenience of not depending on the **presence** of **ports** and **refueling locations** at **remote areas**. Nonetheless, the installation and maintenance of the nuclear propulsion system and the fuel itself is quite costly.

AT: Warming Turn

Breaking ice does not cause climate change.

AR 23. Editors of the Arctic Review. "Myths about icebreakers create misleading perceptions of these ships." Arctic Review. 1-17-2023. https://arctic.review/papers/busting-myths-about-icebreakers/

A rounded bow allows for more efficient icebreaking and helps lift the vessel up under pressure from ice. Broken ice is also directed under the icebreaker through air and water systems. These and other measures prevent broken ice from building up around the front of the ship and, therefore, from slowing it down. It is also important to stress that icebreakers traverse ice-laden waters by **breaking ice**, **not by melting it**. The common misconception that

icebreakers contribute to "**global warming**" by **melting ice** could, **therefore**, **not be further from the truth**.

Oil and gas extraction from the Arctic will be limited. Other regions are cheaper.

Ying **Zhang et al 24**. Researcher at the Joint Global Change Research Institute, Pacific Northwest National Laboratory. With Siwa Msangi, James Edmonds, and Stephanie Waldhoff. "Limited increases in Arctic offshore oil and gas production with climate change and the implications for energy markets." PubMed Central (PMC). 3-20-2024. https://pmc.ncbi.nlm.nih.gov/articles/PMC10954641/

Our results suggest that climate change impacts on Arctic sea-ice thickness will increase Arctic offshore oil production, though with that impact alone, it is likely to remain a **small portion** of **total global oil production**. The climate impacts on Arctic sea ice on offshore natural gas extraction are **likely to be limited**, with production remaining low due to the very low relative costs of onshore natural gas extraction elsewhere in the world. Among Arctic regions, changes in sea ice thickness are likely to have the largest impacts on USA Arctic offshore oil production, particularly for the Alaskan Platform AU. We find the effects of human efforts to achieve a low-carbon future (LowC scenarios) would increase Arctic offshore oil production, due to the simultaneous effect of reduction in unconventional oil production and the gradual depletion of non-Arctic crude oil over the century. Nevertheless, in the near term (before 2030), neither the effects of climate change-induced sea ice thinning nor low-carbon transition scenarios are likely to cause expansion of Arctic offshore oil production into new AUs. In addition, under the explored scenarios, future **Arctic** offshore **oil and gas extraction** is not likely to **affect prices** or **production** in the **broader** global **oil and gas markets**.

Even if massively scaled up, icebreakers would have a miniscule impact on the climate.

NSIDC 23. National Snow and Ice Data Center. "Are icebreakers changing the climate?." National Snow and Ice Data Center. 1-2-2023. https://nsidc.org/learn/ask-scientist/are-icebreakers-changing-climate

How much ice does an icebreaker break?

Meier decided to crunch some numbers and find out. While his numbers are an estimate, they provide a helpful comparison of just how much icebreakers might contribute to summer ice loss. Meier said, "In late June, when the sun's energy is strongest, the total sea ice extent is around 10 million square kilometers (3.9 million square miles). An icebreaker cruising through the ice for 1,000 kilometers (620 miles) and leaving an ice-free wake of 10 meters (33 feet) would open an area of water 10 square kilometers (3.9 square miles) over the entire cruise. In contrast, the Arctic sea ice cover decreases by an average of over 9 million square kilometers (3.5 million square miles) each year during its melt season—an area larger than the contiguous United States.

Even as **icebreaker activity increases**—for example, Russia maintains the world's largest fleet of more than 50 icebreakers in 2023 compared with fewer than 10 icebreakers a decade ago—these numbers **do not significantly change**. Many of Russia's icebreakers are being used to escort ships through the Northern Sea Route, and they tend to follow the same channel. This means that even though there may be multiple icebreakers operating at the same time, they are not breaking much new ice, which would only occur if the ice drifted and blocked the channel. So, Meier said, "The actual contribution is miniscule—only **one part in a million** of the **total ice cover**."

Even if the amount of ice broken **increased** by an **order of magnitude**, say from 10 square kilometers (3.86 square miles) of ice broken by a single icebreaker to **100 square kilometers** (38.61 square miles) of ice broken by **10 icebreakers**, the amount of ice broken would still be **minuscule** compared to the **vastness of the Arctic Ocean.** Because icebreakers have such a **minimal effect** on **sea ice**, they also have a **minimal effect on climate**.

Oil and gas extraction in the Arctic is not economical.

Rebecca **Leber 23**. Senior reporter for Vox covering climate. "The oil industry's cynical gamble on Arctic drilling." Vox. 9-8-2023. https://www.vox.com/climate/23863150/biden-arctic-drilling-big-oil

But these advantages also run up against major barriers that make oil development in the **Arctic uniquely difficult** — challenges that have far more to do with the **environment** there than **environmental regulations**.

The industry aims to squeeze as much as possible out of the cheapest oil reserves it has: areas that will produce a lot of oil for less cost. The Arctic has oil, but it **doesn't come cheaply**. Companies have to **contend** with **frozen roads**, **remote areas**, and **transporting** specialized **rigs** before even **unearthing any oil**. Even in a world without environmental regulations, it simply **costs** more for **oil companies** to drill there, ranking the risks of the Arctic right alongside the risks of **deep-water drilling** and operating in **politically unstable countries**. Because of the expense, these are also long-term investments, from which companies plan to benefit over the course of 30 to 40 years. This introduces a lot more uncertainty because of the many factors that can affect oil prices in that time.

The **Willow Project** faces these **disadvantages** and **more**. Willow still faces legal challenges from environmentalists, but the costs of **drilling** have also gotten worse in **other ways** — **ironically**, **because of climate change**. One example: ConocoPhillips has had to contend with melting permafrost at the sites it intends to drill, which the company will try to neutralize by installing giant chilling devices in the ground.

For Arctic drilling to make sense economically, a company has to bank on prices at the pump remaining high and that consumer demand will still be there for decades to come. That's in spite of expectations that EV sales will **cut into demand** for **gasoline**, with EVs on track to become half of global car sales by 2035.

Just to break even, the oil would likely need to sell somewhere between $63 and $84 per barrel, based on an analysis from the World Wildlife Fund — higher than what energy analysts expect in a world reducing its reliance on oil.

"They're betting that we're not going to be able to stick within the confines of the Paris agreement," Wight said. "Arctic oil is a fundamental bet on the future and what will and will not happen with the energy transition."

Research Advantage Extensions

Icebreakers are necessary. They are the only way to reach remote areas.

VMR 25. Verified Market Research. "Polar Icebreaker Market Size, Share, Scope, Trends & Forecast." February 2025. https://www.verifiedmarketresearch.com/product/polar-icebreaker-market/

The Polar Icebreaker Market can be segmented by end-users into five primary categories: Government Agencies, Research Institutions, Shipping Companies, Energy and Resource Companies, and Tour Operators. Each of these segments plays a pivotal role in the utilization and demand for **icebreakers**, which serve as **essential vessels** for **navigation** through **icy waters**. Government Agencies include national and regional bodies responsible for icebreaker operations for strategic maritime purposes, search and rescue missions, and enforcement of sovereign rights over territorial waters in polar regions. These **agencies** often invest in **advanced icebreakers** to enhance national security and

support scientific missions. Research Institutions **utilize icebreakers** for **scientific research** in **polar environments**, facilitating **oceanographic studies**, **climate** change **research**, and **ecological surveys**.

These institutions depend on icebreakers to **transport researchers** and **equipment** to **remote locations**, where **access** is **otherwise challenging**. Shipping Companies have a growing interest in icebreakers for facilitating shipping routes that are becoming more navigable due to climate change, particularly in the Arctic. These companies seek to shorten transit times and enhance safety in icy waters. Energy and Resource Companies leverage icebreakers to access and transport resources like oil and gas in Arctic regions, where the reliable deployment of icebreakers is crucial for the development of offshore resources. Tour Operators increasingly use icebreakers for eco-tourism endeavors, providing unique travel experiences in polar regions, which adds a recreational angle to the market. By addressing the needs of these diverse end-users, the Polar Icebreaker Market reflects a multifaceted demand that is essential for navigation, research, and resource extraction in harsh environments.

AT: Arctic Not Key

The Arctic is essential to managing global biodiversity.

Tanya A. **Lemieux et al. 25**. Professor in the Department of Biology, Carleton University. Jackson D.R. Coles, Anne L. Haley, Michelle L. LaFlamme, Sara K. Steel, Kara M. Scott, Jennifer F. Provencher, and Courtney Price. "Persistent and emerging threats to Arctic biodiversity and ways to overcome them: a horizon scan." Arctic Science, 14 January 2025. https://doi.org/10.1139/as-2024-0035.

While often considered remote, the Arctic **plays** a **large role** in the **functioning** of many **global environmental systems** (Post et al. 2019; Timmermans and Marshall 2020). **In particular**, the Arctic is involved with the **regulation** of **global climate** (McGuire et al. 2006) with important **implications** for the **ongoing climate crisis** (Díaz et al. 2019). While the Arctic may hold less **biodiversity** than other **biomes**, this biome's **biodiversity** is **unique** in that it includes more than 21 000 known species of fungi, plants, and animals that are highly adapted to life in the cold and in some cases **could not survive without it** (see Fig. 1; Callaghan et al. 2004; Payer et al. 2013; Ruth et al. 2023). These adaptations come in many forms. For example, Arctic plants and microorganisms have traits that make them tolerant to freezing, and Arctic animals have developed various mechanisms such as fat storage that allow them to tolerate frigid temperatures (Callaghan et al. 2004; Guerrero and Rogers 2019). On a global scale, the Arctic is home to 27% of the world's marine mammal species (Payer et al. 2013) and more than 20% of the world's lichenicolous fungi species (i.e., fungi that live on lichens; Dahlberg and Bültmann 2013; Payer et al. 2013). The Arctic also provides habitat for hundreds of species of birds that migrate to the Arctic from around the globe to breed and forage (Sullender 2019). There is even diversity within Arctic sea ice where numerous bacteria, viruses, algae, and sea ice infauna (e.g., ciliates, nematodes, turbellarians, crustaceans) reside (Bluhm et al. 2011; Patrohay et al. 2022).

Ecological disruptions cascade globally---extinction.

Eddy **Carmack 19**. Gail Whiteman, Jeremy Wilkinson, Jan-Gunnar Winther; January 9; Senior Research Scientist Emeritus for the Department of Fisheries and Oceans; Professor of Sustainability, University of Exeter Business School; Sea Ice Physicist; Director, National Centre for the Ocean and the Arctic, Norway; World Economic Forum, “4 reasons why the Arctic is key to our planet’s survival,” https://www.weforum.org/agenda/2019/01/4-reasons-why-the-arctic-is-key-to-our-planets-survival/

There are four reasons why the **Arctic Ocean** is distinct from other oceans and critical to our planet’s **survival**:

First, while this relatively small (by ocean standards) marine environment holds only 1% of the world’s ocean volume and occupies only 3% of the world’s ocean surface area, its impact on the global **climate** **system** is disproportionately **large**.

Second, though small in area, it scoops up over 10% of **global river runoff** and claims twenty of the world's 100 longest rivers.

Third, the Arctic marine domain comprises about a third of the world's coastline.

And fourth, the Arctic Ocean contains one-quarter of the world's **continental shelf**, of immense socio-ecological importance.

On all counts, the little Arctic Ocean holds its own on the global stage.

Despite its importance, the Arctic Ocean sometimes goes missing from public ocean-talk as more 'local' marine issues take centre stage. A key point for non-experts is to recognize that the Arctic Ocean is different from other oceans and it is the **critical driver** of the global **oceanic conveyor belt**. For example, the **Gulf** Stream and **North Atlantic** Current are strongly regulated by processes that occur in the **Arctic**. The Arctic Ocean is remote to many of us, but its influence can be felt everywhere.

How do we know this? Oceanographers have **robust scientific evidence** on the role the Arctic plays within our planet. For instance, the global **hydrological cycle** determines the distribution of water around the planet – and affects **food** and **water security** globally. This cycle begins in warmer climates, with the equatorial trade winds and mid-latitude westerlies. It is refined and shaped by the global distribution of land masses that, in the northern hemisphere, collect precipitation and direct it poleward through massive rivers. These rivers introduce substantial amounts of fresh water into the upper layers of the Arctic Ocean, providing the required conditions for an ice cover to form, and regulating nutrient supplies and biological productivity.

But these dynamics are undergoing unprecedented and worrying changes that are already visible. Jonathan Smith, producer of Blue Planet II, reflected on the new realities of filming in the Arctic Ocean: "We were all set and ready to film but we needed two major things – walrus and ice. I had expected that walrus may be hard to find, but I did not expect it to be hard to find ice in the Arctic…. the crew were all commenting how surprisingly warm it was." They were not mistaken. Over many years, scientists have been recording changes in global temperature, hydrological cycles and sea-ice cover. These changes have all had significant and eminently observable effects on the Arctic Ocean. Over the past two decades alone, summer sea-ice coverage in the Arctic Ocean has decreased by about seven million square kilometres to just over 3 million square kilometres. This loss represents a surface area larger than all but about a dozen countries in the world.

However, the Arctic Ocean is not just a passive victim of anthropogenic change: it also **drives disruptions** back to the **global system** in ways that were overlooked even a decade ago. Though the exact mechanisms are still debated, Arctic sea-ice loss may be affecting both ocean currents and mid-latitude weather patterns along our southern borders. And the processes occurring in the Arctic play a vital role in connecting the Pacific and the Atlantic. The fabled Northwest Passage is more than a destination for explorers and commercial ship traffic; the Arctic is an oceanographic **freight train** that ties together and influences other **maritime regions** and the **global climate system**.

AT: Nuclear Accidents Turn

The risk of accidents is low.

Georgy **Zerkalov 16**. Project Coordinator at Hydraulics LLC, M.S. Candidate in Chemical Engineering. "The Nuclear Powered Icebreakers." Stanford University. 3-12-2016. http://large.stanford.edu/courses/2016/ph241/zerkalov2/

As mentioned by Melis Tekant the **nuclear ships** produce and utilize cleaner energy that **diesel powered counterparts** - the nuclear fission releases **no greenhouse gases**. [4] Nonetheless, there is a risk of **catastrophic damage** that could be cause by the **nuclear fuel leakage** or other **accident**.[1] Luckily, there has been **no precedent** of that in the history of **nuclear powered icebreakers**.

No risk of nuclear accidents. There hasn't been a single incident in over 50 years of usage.

WNA 23. World Nuclear Association. "Nuclear-Powered Ships," World Nuclear Association, updated 02/2023, URL: https://world-nuclear.org/information-library/non-power-nuclear-applications/transport/nuclear-powered-ships.aspx

The USA has the main navy with nuclear-powered aircraft carriers, while both it and Russia have had nuclear-powered cruisers (USA: 9; Russia: 4). The USA had built **219 nuclear-powered vessels** to mid-2010. All US aircraft carriers and submarines are nuclear-powered. (The UK's new large aircraft carriers are powered by two 36 MW gas turbines driving electric motors.) The US Navy has accumulated **over 6200 reactor-years of accident-free experience involving 526 nuclear reactor cores** over the course of **240 million kilometres**, without **a single radiological incident**, over a period of **more than 50 years**. It operated 81 nuclear-powered ships (11 aircraft carriers, 70 submarines – 18 SSBN/SSGN, 52 SSN) with 92 reactors in 2017. There were 10 Nimitz-class carriers in service (CVN 68-77), each designed for 50-year service life with one mid-life refuelling and complex overhaul of their two A4W Westinghouse reactors*. The Gerald Ford class (CVN 78 on) has a similar hull and some 800 fewer crew and two more powerful Bechtel A1B reactors driving four shafts as well as the electromagnetic aircraft launch system. It has an expected service life of 90 years. The Ohio-class SSBNs have a service life of 42 years.* The seventh such vessel overhaul after 25 years is the Stennis, taking 4.5 years and costing $2.99 billion. It involves major upgrades to the propulsion plant, to the flight deck, catapults, combat systems and the island superstructure.

AT: No Arctic Disease

"Black swan" pathogens risk catastrophic extinction.

Carissa **Wong 23**. "'Black swan' pathogens from ancient permafrost may be getting ready to wake up." Live Science. 8-2-2023. https://www.livescience.com/planet-earth/arctic/black-swan-pathogens-from-ancient-permafrost-may-be-getting-ready-to-wake-up

Ancient pathogens that have been locked away for hundreds of thousands of years are starting to **emerge** from permafrost as climate change takes hold — and **around 1%** of these could pose a **substantial risk** to **modern ecosystems**, a **study has found**.

"It is the first attempt to try modeling the potential ecological effect of these kinds of time-traveling invaders from a quantitative perspective," Giovanni Strona, a professor of ecological data sciences at the University of Helsinki and co-author of the study, told Live Science.

Permafrost is a mixture of soil, gravel and sand bound together by ice. It is found either on or beneath Earth's surface in regions of the Arctic, including parts of Alaska, Greenland, Russia, China and Northern and Eastern Europe. When permafrost forms, microbes like bacteria and viruses can get trapped inside it and can survive in a state of suspended animation for thousands or even millions of years. Warmer periods can kickstart metabolic processes that allow these dormant microbes to reactivate and reproduce.

Amid global warming, some of these microbes, including those with the potential to cause disease, are being **released** as the **permafrost thaws**. In 2016, an anthrax outbreak in Siberia killed thousands of reindeer and affected dozens of people, which scientists attributed to melting permafrost.

Related: Nematode resurrected from Siberian permafrost lay dormant for 46,000 years

These pathogens pose a potential risk because humans and other living organisms alive today have not been exposed to them for so long — meaning modern ecosystems may have few defenses against them.

"If pathogens have been living alongside bacterial, human or animal communities for a long time, you can expect some co-evolution between the pathogens and the local community, which reduces the risk that pathogens pose to ecosystems," said Strona. "But when you have a time-traveling invader, you clearly have the introduction of novel elements of risk."

To estimate how re-emerging pathogens might impact modern ecosystems, Strona and his team digitally simulated the evolution of virus-like pathogens that were able to infect and cause disease in bacteria-like hosts.

In the simulation, digital microbes had to compete for resources, mimicking what happens in the real world. Some of the viruses infected and killed a fraction of the bacteria-like hosts, while other bacterial hosts developed immunity against the evolving pathogens.

By "infecting" 5% of the modern bacteria-like hosts — that had evolved in more recent generations — with ancient virus-like pathogens from much earlier generations, the team found that 1% of viral pathogens could substantially disrupt more recently evolved bacterial communities.

Some of the viral invaders caused 32% of the bacteria-like species to die out, while others caused the diversity of bacteria-like species to increase by up to 12%.

The team **dubbed the 1% pathogens "black swans"** — referring to a rare and unlikely, but **hugely impactful event**. They argued that, while the probability of them emerging and wreaking havoc is low, their **impact** would **be catastrophic**, so they should be **considered** in **future climate scenarios**.

"As a society, we need to understand the potential risk posed by these ancient microbes so we can prepare for any **unintended consequences** of their release into the **modern world**," co-author Corey Bradshaw, from Australia's Flinders University, said in a statement. "The results tell us that the risk is no longer **simply** a **fantasy** that we **shouldn't be prepared to defend against**."

Add-Ons

Oil Spills

Icebreakers are needed to respond to oil spills.

Shiva **Polefka 15**. Policy Analyst for American Progress's Ocean Policy program. "Icebreakers: Essential Assets for a Changing Arctic." Center for American Progress. 3-5-2015. https://www.americanprogress.org/article/icebreakers-essential-assets-for-a-changing-arctic/

Oil spills on ice: Preparing for the risks of **year-round Arctic oil production**

"We are minded to drill this year in the Chukchi," Shell CEO Ben van Beurden told reporters on a January 29, 2015 earnings call. He reinforced his point with a commitment to spend $1 billion on the effort this year, on top of the $6 billion Shell has already spent on its current Arctic campaign. This resoluteness comes despite a disastrous 2012 exploratory drilling campaign that called into question the company's competence to operate safely in Arctic conditions. That year, Shell's legally required oil spill containment unit was "crushed like a beer can" during tests in the calm waters of the Puget Sound; its drilling contractor committed eight felony violations of maritime safety and water pollution laws, resulting in $12.2 million in federal fines; and, at the season's end, Shell's 250-foot-tall, customized drill rig Kulluk ended up aground after its contractor attempted to tow it through gale force winds and 25-foot swell in a mad dash across December seas in order to avoid tax liability to the state of Alaska. Coast Guard officers led the coordinated response to the multi-day emergency, and its Alaska-based aviators saved the Kulluk's 18 crewmembers in a harrowing rescue operation, effectively preventing the crisis from becoming a tragedy.

Hopefully, Shell will be better prepared and more judicious in its next Arctic foray than it was in 2012. But the **human error**, system **failures**, and life-threatening emergencies that stymied the **oil company**—one of the world's richest and most experienced—demonstrate the critical necessity of **sustained Coast Guard presence** in a region with truly humbling working conditions. Once the company has located ideal well sites, it will reportedly take 7 to 10 years to build permanent offshore platforms and other infrastructure needed to produce oil year round, at which point both Shell and the Coast Guard must be prepared to conduct emergency and **oil spill response** year round, including in the **ice-bound Arctic winter**.

Yet **Polar Star**, already on an unplanned service-life extension, will likely not last longer than 7 to 10 years, and Polar Sea's potential reactivation remains uncertain. Meanwhile, the construction of a new heavy icebreaker could take as **long as 10 years**, as U.S. shipyards have not built such a vessel since launching the two Polar-class vessels nearly 40 years ago.

Coast Guard presence in the **Arctic** is **indispensable** in ensuring the safety of offshore Arctic **oil and gas production** and to **mitigate** the **worst impacts** of any **potential accident**. Recall that in 2010, 60 Coast Guard vessels and 22 of its aircraft were deployed in the response to BP's Deepwater Horizon oil spill in the Gulf of Mexico. Yet the U.S. government and the Coast Guard are fast approaching a **major gap** in **Arctic capability**, one that would force the mariners, ocean-dependent communities, and ecosystems of the Alaskan Arctic to simply wait until summer for help should they face an **oil spill in winter**.

Oil spills are inevitable and risk human survival

Gerardo **Bandera 23**. Editor for *New Scientist*. "How Oil Spills Affect Humans and the Environment," Fair Planet, 1/18/23, https://www.fairplanet.org/story/how-oil-spills-affect-humans-and-the-environment/

Despite the remarkable **importance** of the **oceans** for people and the environment, they are often victims of mankind's greed and unquenchable thirst for fossil fuels. Annually, 2.7 million litres of oil are spilled in the seas, **contaminating waters**, **killing organisms** and **causing lasting damage** to ecosystems and economies.

The open seas are **crucial for sustaining human life**: they feed us, generate the oxygen we rely on and regulate our climates. They are also homes to thousands of species of animals and microorganisms that form incredible marine ecosystems. Yet irresponsible human activities, like deep-sea fracking, disposing of untreated water and reckless waste dumping, destabilise the equilibriums of these aquatic environments, poisoning thousands of animals and people. Of the major sources of ocean pollution, **oil spills are one of the most damaging and difficult to remedy.**

Trade Routes

Icebreakers are necessary to keep open emerging Arctic trade routes. That's key to global trade.

Sylvia **Jordan &** Antonio **Salinas 25**. Both are active duty US Navy officers and PhD students in the Department of History at Georgetown University. "Melting Frontiers: A Bold Vision for US Strategy in a Warming Arctic." Modern War Institute -. 2-7-2025. https://mwi.westpoint.edu/melting-frontiers-a-bold-vision-for-us-strategy-in-a-warming-arctic/

"The position of the United States upon the two oceans would be either a source of great weakness or a cause of enormous expense." When Alfred Thayer Mahan penned these words, Alaska was not yet a state and the Arctic was still a vast icescape. But now Mahan's predictions must undergo a twenty-first-century update to account for the arrival of the third frontier: a blue Arctic. As ice melts, **new trade routes will emerge**, resources **long hidden beneath** the **ice** will become **accessible**, and a new strategic **battleground** will **emerge** at the **top of the world**. While politicians and pundits debate the validity of climate change and its causes, the Arctic **continues** to **melt**, with blue waterways capable of supporting **deep-draft commercial** and military **vessels** predicted by 2050. Although continued focus on the Indo-Pacific, Atlantic, Mediterranean, and Red Sea

regions holds merit, **accepting risk in the** Arctic may **result in failure** to prepare for and adapt to the significant diplomatic, economic, cultural, and military transformations already in the making.

As the **Arctic's melting ice** opens **new shipping routes**, thaws previously ice-protected shores, and unlocks access to untapped resources, the far north takes on **new strategic importance**. Indeed, the **Bering Strait**—expected to become the Arctic's Gibraltar—is already a **chokepoint** for **global shipping** and military operations. Furthermore, Russia's militarization of **Arctic territories** and China's growing Arctic ambitions demand our **urgent attention**. In order to **safeguard** our **national interests** and promote **global stability**, the United States must ignore the red herring of climate debates and instead accept the reality of ice melt by honing a **comprehensive** and **aggressive Arctic strategy**. We have not a moment to waste: already lagging years behind our competitors in this arena, such a combined effort among US military, federal, and private entities will require decades of planning.

Climate Change and Warfare: An Environmental History

While Earth's climate is changing at a faster pace than ever before, climatic episodes over the past two thousand years—like the Roman Climate Optimum (200 BCE–150 CE), the Little Antique Ice Age (300 CE–700 CE), the Medieval warming period (950 CE–1250), and the Little Ice Age (1350–1850)—offer important perspective. In this era of human-influenced climate change, these periods tell us that climate change does not always spell disaster. Indeed, studies of these periods tell us that climate influences the conduct or outcome of war rather than determining it. Our modern era of climate change can certainly exacerbate vulnerabilities for those militaries who ignore it; but for those who most capture the winds of history into the sails of their respective war machines, it can provide strategic opportunities.

Climate can influence who you fight, what you fight over, when you fight and where, and perhaps most importantly, why you fight. Changing Arctic conditions demand strategists consider those five W's in a twenty-first-century context. Before 2050, the United States, Canada, Denmark, Norway, Sweden, and Finland must assess how the diminishing North Pole ice wall will transform into blue borders accessible not only to trade, but also to other strategic competitors, like Russia and China. **The importance** of such considerations could hardly be overstated: **Arctic flashpoints** include vast **mineral resources**, largely untapped **oil and gas reserves**, and disputes over **sovereignty** within **exclusive economic zones** and resultant **trade wars**. In the past, such considerations have only been necessary in the summer months (except for submarine and long-range air assets), when climate conditions were most hospitable to both land and sea forces. Yet melting ice is projected to allow for year-round naval and **commercial shipping competition** as early as **2050**—with sea trade via the region expected to double by 2035. Compared to the Panama and Suez Canals, the Northern Sea Route offers significantly **reduced transit times**—and with it, **fuel costs**—thus rendering it perhaps the most **lucrative alternative** to traditional **shipping lanes**.

But why reallocate resources from our present strategic footprint? Simply put, the Arctic is quickly evolving into the new dance floor for geopolitical competition (including, in its most extreme manifestation, warfare), replete with all the classic Thucydidean trappings of fear, honor, and interest. This is not an exaggeration: Russia and China have already signaled their desire for Arctic dominance. With the world's largest icebreaker fleet, Russia poses the most dominant and formidable force in the region. Russia has seized the strategic and operational advantage, maintaining near-continuous operations in the Arctic, sharpening firsthand experience in the seascape, and challenging any foreign militaries who dare transit these frigid waters. Not far behind Russia, China—the self-proclaimed "near-Arctic state"—has similarly declared itself a regional force. China has invested heavily in its Polar Silk Road, thus expanding its maritime and global spheres of influence and all but guaranteeing strategic and economic returns in the region.

US Arctic Strategy

In recent years, DoD's Arctic Strategy has undergone considerable review and revision. Indeed, current policy is drastically different from the policies of a decade ago. These new strategic visions no doubt have heightened our awareness of the Arctic's growing geopolitical importance, and these policies are not without their strengths. But our most recent strides leave one wondering: Are we doing enough? The United States is an Arctic nation, but does our strategic policy fully reflect this? Current US strategy acknowledges, for example, the Arctic is not just warming—it's becoming a new arena for strategic competition. In this light, the strategy's "monitor-and-respond" approach reads as both too passive and too reactive for the competitive contest likely to develop in the far north. While we recognize the innate importance of robust monitoring and other intelligence, surveillance, and reconnaissance capabilities in the region, we also acknowledge that China and Russia are already conducting combined exercises off the coast of Alaska. Considered in this light, our monitor-and-respond strategy resembles the military equivalent of relying on a giant Ring camera: it's great for observation, but insufficient for deterring adversaries and projecting power.

More alarming still, the United States lags woefully behind her fellow great powers in Arctic preparations. By the time the United States published its first radical transformation of Arctic strategic policy, it was decades, even centuries, behind Russia's interest in the region—an interest that transformed into action by the 2000s. Likewise, China has been honing its Arctic intentions since 2013, when it gained "observer" status in the Arctic Council. The following year, Russia created its Arctic Joint Strategic Command, and just three years after that, declared its plans to "phase NATO out of the Arctic." By 2018, China published its first Arctic policy white paper, and shortly after launched its first domestically built icebreaker. In 2023, Russia declared the Arctic its second priority—a priority Moscow is well positioned to promote with its already robust Arctic presence and operating bases. Two of the world's most powerful militaries have signaled their intent to establish strategic, diplomatic, and economic dominance of the world's smallest ocean. Can the United States really afford to simply monitor and respond?

We recognize this call to action is not without significant obstacles. As our most current Arctic Strategy rightly points out, we must "balance against other DoD global commitments"—and we have to determine how to do this in an environment replete with fiscal, structural, environmental, and manpower challenges. We are not suggesting that DoD abandon our global commitments in favor of Arctic operations. We are arguing, however, that the department cannot abandon Arctic power projection in favor of keeping global commitments. It will be hard. It will stretch our forces and our capabilities. But it is worth remembering that Russia is doing both. China is doing both. And increasingly, they are doing both together—including in back-to-back naval exercises in 2022 and 2023 off the coast of Alaska. Accordingly, we must do both, and we must start now. US Arctic strategy and policy must shift from a future-oriented mindset of what we will do when time and resources allow to an ethos of what we are doing now, lest we look back in 2030 or 2050 at what we should've, could've, or would've done differently to prepare for a blue Arctic. In this light, aiming principally to "manage risk in the region" is not an acceptable substitute for establishing presence. The United States must take action now to ensure we are prepared to successfully maintain peace and prosperity in the blue Arctic.

Policy Recommendations

We do not diminish the immense difficulties the United States faces in implementing such active—but vital—strategic and operational postures. Establishing a presence in the Arctic and also maintaining presence and capability in other global regions with US interests at stake will stretch our manpower and our assets. But we argue our stated objectives can be achieved in the following ways:

1. Increase year-round air, land, surface, and subsurface operations in the Arctic now. We can ill afford, as the 2024 DoD Arctic Strategy puts it, to "explore options to improve mobility in all seasons and variable conditions across the Arctic's diverse geography and weather" when our adversaries are already past the exploratory and into the operational phase. The Arctic is a highly dynamic operational environment that forces even the most seasoned DoD operators to perform familiar tasks in new ways. We must practice these tasks in adverse conditions now.

2. Assess manpower and other resource alignment against the full range of US global interests and ensure the Arctic is appropriately resourced. Based on the findings, DoD should be prepared to consider an increase in the size of the US military while simultaneously ramping up sustained year-round Arctic operations.

3. Build or obtain more polar-capable icebreakers now. Russia's icebreaker fleet far exceeds ours. Indeed, even our "**near-Arctic**" peer competitor, China, has more. **Expanding the icebreaker fleet** will ensure **year-round access to** and presence in **Arctic waters**.

That solves all global war.

Daniel W. **Drezner 23**. American political scientist. He is known for his scholarship and commentary on International Relations and International Political Economy. 9-12-2023. "The Dangers of Misunderstanding Economic Interdependence." Cato Institute. https://www.cato.org/publications/dangers-misunderstanding-economic-interdependence. ---ML

This essay stands athwart this paranoia about malevolent forms of interdependence and yells, "stop!" Economic interdependence is hardly a cure-all for U.S. national security concerns, but it also is not the acute national security threat that is commonly articulated inside the Beltway. Concerns have been **greatly exaggerated**, while the **geopolitical benefits** of **interdependence** have been **underestimated**. Even in 2023, China's interdependence with the Organisation for Economic Co-operation and Development economies has acted as a constraint on its foreign policy behavior. Indeed, the Biden administration seems belatedly aware that it has stigmatized trade with China a bit too much. If current trends persist, however, the United States risks further geoeconomic fragmentation—and the loosening of those constraints. The worldview of malevolent interdependence is likely wrong, but those fears can be self-fulfilling. In other words, if policymakers continue to view globalization as a threat, then the combined policy responses are likely to increase the likelihood of great power conflict.

How Could Economic Interdependence Affect World Politics?

The liberal paradigm in international relations (not to be confused with how the word "liberal" is used in the left-right distinctions of American politics) rests on a "Kantian triad" of interlocking forces designed to prevent the anarchic nature of world politics from spilling over into violent conflict. It was believed that a world of democratic states, international organizations, and economic **interdependence** would lead to a pluralistic **security community** in which **no state** would have the **incentive** to **start a war**. Within Kant's own writings, it is true that the economic interdependence plank was the weakest of the three. Modern scholars, however, have argued that the logic of **commercial peace** is as strong or **stronger** than that of **democratic peace**.

Commercial peace between **nations** operates through multiple **causal mechanisms**. The simplest one is at the individual level: in trading states, **ambitious individuals** will flock to the **commercial sector** rather than the **security sector**, thereby **taming** ~~man's~~ passions and converting them into **economic self-interest**. At the domestic **political level**, the growth of trade between countries also creates **interest groups** on both sides with a **vested interest** in maintaining **harmonious bilateral relations**. At the level of the **international system**, commercial peace **operates** by a simple **rational choice**: state leaders will be wary of the **loss of wealth** that would come with a **war** against a **trading partner**. These logics are not mutually exclusive but rather reinforcing—and all of them contribute to the power of commercial peace.

Some liberal scholars have gone even further. Keohane and Nye argued that complex **interdependence** would drastically **reduce the utility** of force in world politics. Erik Gartzke argued that capitalist peace is **so powerful** that it is the **primary driver** behind **democratic peace**. Gartzke suggested that the spread of **market forces** reduces violence for multiple reasons, including that "the historic impetus to

territorial expansion is tempered by the **rising importance** of intellectual and **financial capital**" and that "the rise of global capital markets creates a **new mechanism** for competition and communication for states that might otherwise be forced to fight." He is hardly the only scholar to advance this argument. More popular proponents, like Thomas L. Friedman, argued that globalization was so powerful that it flattened many power differentials that existed in the world.

Negative Case Answers

AT: Inherency

Status Quo Solves Shipbuilding:

1. The ICE Pact signals a commitment to building more icebreakers.

James **Whitaker 24**. Writer at BENS. "Pact on Icebreakers Will Strengthen US Arctic Presence." Business Executives for National Security. 10-6-2024. https://bens.org/pact-on-icebreakers-will-strengthen-us-arctic-presence/

The United States, Canada and Finland have **agreed** to **coordinate** their development of **new icebreaking vessels**

At the NATO Washington summit in July, Canada, Finland and the United States announced a collaboration on development of new icebreaking ships. The Icebreaker Collaboration Effort, a non-binding agreement colloquially known as the ICE Pact, will enable the three countries to strengthen their shipbuilding industries through information sharing, workforce development and procurement alignment. Arctic concerns are growing in Washington, which published an updated strategy for the region earlier this year.

What next

A joint memorandum of understanding that outlines a framework for implementing the arrangement is expected to be signed before 2025, and the Biden administration may push for this to happen ahead of next month's US presidential election. The memorandum will also include a mechanism for admitting other countries into the ICE Pact; Russian and Chinese interest in the Arctic may encourage others to join.

Subsidiary Impacts

A bipartisan congressional group has asked the White House to prioritise service to the Great Lakes region within the ICE Pact framework.

Quebec-based Davie, Canada's largest shipbuilder, has announced plans to open a shipyard in the United States.

Last month, China sent its three vessels into the Arctic and announced that it would fast track the construction of a fourth icebreaker.

Analysis

The **ICE Pact sends** an **immediate signal** to **industry partners** that **Canada**, the **United States** and **Finland** are committed to **purchasing more icebreakers**. Shipbuilders are responding by **investing** in **supply chains** and **shipyards** in **anticipation** of **these orders**, positioning themselves to earn procurement contracts when public funding for new projects is made available.

The arrangement reflects NATO's awareness of the Arctic's growing importance, particularly as Russia and China seek to assert their presence in the region with icebreaker fleets of their own. In the medium-to-long term, collaborative workforce **development** and information sharing will shorten the **timeline** for icebreaker design and **construction**, giving the ICE Pact partners an opportunity to close the gap between the size of their fleets and that of Russia, in particular.

2. White House efforts in other areas solve.

Andrea **Shalal 25**. Reporter for Reuters, with Jonathan Saul and Lisa Baertlein. "Trump signs executive order seeking to revitalize US shipbuilding." Reuters. 4-9-2025.

https://www.reuters.com/business/autos-transportation/trump-expected-sign-executive-order-us-shipbuilding-sources-2025-04-09/

WASHINGTON, April 10 (Reuters) - U.S. President Donald **Trump** signed an executive order on Wednesday aimed at **reviving U.S. shipbuilding** and reducing China's grip on the global shipping industry, vowing to **boost funding** for the effort in **coming years**.

Republican and **Democratic** U.S. lawmakers for years have warned about China's **growing dominance** on the seas and **diminishing U.S. naval readiness**.

Senators Mark Kelly, a Democrat, and Todd Young, a Republican, welcomed the executive order and said they would reintroduce their bipartisan legislation to provide the congressional authorizations needed to revitalize the industry.

The order directs the U.S. Trade Representative to move ahead with a proposal that included levying million-dollar U.S. port docking fees on any ship that is part of a fleet that includes Chinese-built or Chinese-flagged vessels. Allies will be pushed to act similarly.

USTR's recommended port fees had sparked sharp criticism from commodities exporters, trade groups and U.S. ship operators, who warned of supply chain disruptions, job losses in port cities and inflation. The order must be finalized by an April 17 deadline.

U.S. Trade Representative Jamieson Greer on Wednesday said USTR should have a final decision on remedies by middle of the month and repeated his comments from Tuesday, saying that not all of the measures outlined by the agency's original proposal would be implemented.

"This could have been a miscommunication issue, some people thought that all of those measures would be imposed," Greer said. But after feedback and public comments, "now we consider which of those measures is most appropriate."

The order also requires USTR to consider proposing tariffs on ship-to-shore cranes manufactured, assembled, or made using components of Chinese origin, or manufactured anywhere in the world by a company owned, controlled, or substantially influenced by a Chinese citizen, as well as tariffs on other cargo handling equipment.

The executive order further requires the Department of Homeland Security to enforce collection of Harbor Maintenance Fees and other charges, and to prevent cargo carriers from circumventing those fees by routing goods to ports in Mexico and Canada and then sending cargo into the United States via land borders.

Asked about the U.S. order on Thursday, China's foreign ministry said the idea that China was to blame for the U.S. losing its competitive advantage in the shipping industry had no basis in fact.

"The development of China's shipbuilding industry is the result of technological innovation and active participation in market competition by enterprises," ministry spokesperson Lin Jian told a regular press conference.

Trump, speaking in the Oval Office, said the United States would be spending "a lot of **money on shipbuilding**" to **restore American capacity** in the **sector**.

"We're **way, way, way behind**," he told reporters. "We used to build a ship a day, and now we don't do a ship a year, practically, and we have the capacity to do it."

The order said recent data showed the United States built less than 1% of commercial ships globally, while China built about half, an increase from just 5% in 1999, according to the Center for Strategic and International Studies.

Trump's order called for creation of a Maritime Security Trust Fund to provide reliable funding for programs aimed at **shoring up U.S. maritime capacity**, **including** consideration of potential new or existing tariff revenue, fines, fees, or tax revenue.

It also calls for incentives to encourage private investment in construction of commercial components, and improvements to shipyards, repair facilities and dry docks.

The **U.S. shipbuilding industry**, which peaked in the 1970s, has struggled due to high costs and a complex regulatory structure, which has **enabled rivals** including China to **grow rapidly**.

ICE Pact Solves

The ICE Pact solves. It's sufficient to bring foreign expertise to American shipbuilding.

Laura ***Heck*mann 24**. Senior Editor, National Defense Magazine. "Trilateral Pact Aims To Bolster Icebreaker Production." National Defense. 10-23-2024. https://www.nationaldefensemagazine.org/articles/2024/10/23/trilateral-pact-aims-to-bolster-icebreaker-production

The recent announcement of a collaborative agreement between Finland, Canada and the United States to build polar icebreakers comes as China has declared itself a "near-Arctic state" and Russia is operating the largest fleet of icebreakers in the world, including the only ones that are nuclear-powered.

But the pact is as much about **bolstering allied shipbuilding industries** as it is about addressing global threats, and all **three nations** have something to **gain**, experts said.

The Icebreaker Collaboration Effort, or **ICE Pact**, announced on the sidelines of NATO's 75th anniversary summit in Washington, D.C., July 11, is a trilateral agreement between the three nations to collaborate on the production of polar icebreakers alongside allies and partners, labor and industry.

A statement from the White House announcing the agreement said the collaboration is intended to "strengthen the **shipbuilding industry** and **industrial capacity** of each nation" and "build closer security and economic ties among our countries through information exchange and mutual workforce development focused on building polar icebreakers, as well as other Arctic and polar capabilities."

The details of the agreement remain hazy, with a memorandum of understanding promised "by the end of the year," but the statement said the three governments intend to utilize shipyards in the United States, Canada and Finland to "build polar icebreakers for their own use, as well as to work closely with like-minded allies and partners to build and export polar icebreakers for their needs at speed and affordable cost."

U.S. National Security Advisor Jake Sullivan told reporters the day of the announcement that the pact is about "enhancing the collective capacity of our three countries to build icebreakers at a time when we are seeing an increasing need for those icebreakers from partners around the world who want to operate in both the Arctic and Antarctic regions."

This "increasing need" puts **added pressure** on a **U.S. shipbuilding industry** that is already a **weak link** in the **country's defense industrial base**, suffering from **delayed programs**, maintenance **backlogs** and **workforce** and supply chain **shortages**, according to government watchdogs.

The U.S. Coast Guard has only two operational polar icebreakers: the heavy Polar Star and the medium Healy. Polar Star was commissioned in 1976 and Healy in 2000. Both the fleet's size and age create maintenance vulnerabilities that could cut the fleet in half if one is out of commission.

The service has been working to expand its fleet through the Polar Security Cutter program, which has been "plagued by delays" and more than doubled in cost, according to a report by the Congressional Budget Office released in August.

An October Congressional Research Service report noted that the Coast Guard needs eight or nine polar icebreakers, and the first of the new ships is not likely to enter service until 2029. That raises questions about what the United States will be able to deliver under the pact when it is struggling to meet its own demand.

A letter to the White House signed Oct. 2 by Sen. Chris Murphy, D-Conn., chairman of the Senate Appropriations Subcommittee on Homeland Security, Sen. Cindy Hyde-Smith, R-Miss., and Sen. Patty Murray, D-Wash., said a reliable icebreaker fleet is "critical" to achieving strategic objectives in the Arctic.

The letter also said that strengthening the shipbuilding industry of each ICE Pact country and generating "**good jobs at shipyards** and related businesses all over" is the **aim** of the **partnership** — especially for advancing polar icebreaker recapitalization in the United States that is "far too slow."

Finland and **Canada** can help, bringing to the **agreement** a **history** of icebreaker design and **shipbuilding experience**. Canada has the second largest icebreaker fleet in the world behind Russia. Meanwhile, 60 percent of the world's icebreakers are produced at Finnish shipyards and 80 percent are designed by Finnish companies, according to the Finnish government.

A Canadian government release said the country's "world-class expertise in Arctic and polar capabilities" will be "foundational" to the agreement's success.

That enables the US to rebuild the commercial shipbuilding industry.

Katy **Buda 24**. Associate Director, Defense-Industrial Initiatives Group. With Gregory Sanders, and Cynthia R. Cook 8-1-2024. "Recruiting Friends for the Polar Icebreaker Express: Viewing the ICE Pact through Broader Defense Industrial Cooperation." CSIS. 8-1-2024. https://www.csis.org/analysis/recruiting-friends-polar-icebreaker-express-viewing-ice-pact-through-broader-defense

A4: The details of the ICE Pact will be clarified through the eventual **implementation** plan, which should be designed to manage potential risks to the effectiveness of the initiative. These considerations relate to the open question as to the extent of allied demand, a lack of details on manufacturing capacity growth, and the difficulty of coordinating the sequencing and distribution of icebreaker production and delivery.

To generate impact, collaboration must account for best practices in scaling production, including lessons in surge capacity. The **ICE Pact** endeavors to facilitate a **greater shipbuilding workforce**, but the agreement will **need** to be **dedicated** to this **cause**. Delays in **Navy shipbuilding** are the **result** of **constraints** on supply chains and the **available workforce**. The United States is at a serious disadvantage, as it lacks a major **commercial shipbuilding industry** and cannot **produce at scale.** despite the industrial base protection offered by the Jones Act. The Jones Act requires ships transporting goods from one U.S. location to another be built in U.S. shipyards, sail under a U.S. flag, and be crewed by U.S. citizens or permanent residents.

AT: Solvency

Increased federal funding for shipbuilding won't rebuild the industry.

David J. **Lynch 25**. Staff writer, MA in international relations from Yale University. "Trump Wants To Build More Ships In The United States. It's Not So Simple." Washington Post. 3-23-2025. https://archive.ph/5AN2Z#selection-537.0-537.73

President Donald Trump appears set to broaden his attack on global economic integration by imposing new multimillion-dollar fees on the **Chinese container ships** that bring many foreign goods to U.S. shores.

The proposed fees are intended to counter what the administration describes — echoing its predecessor — as unfair Chinese trade practices that have given Beijing a chokehold on the construction of commercial vessels.

Part of a broader White House strategy to revive U.S. shipbuilding, the levies threaten the system of oceangoing trade that has developed over the past quarter-century — and could result in a repeat of the supply chain disruptions the nation suffered during the pandemic.

By charging Chinese-owned or -built vessels each time they dock at a U.S. port, the administration hopes to discourage ocean carriers from buying more ships from China. The U.S. government would spend some of the tens of billions of dollars raised through the fees on subsidizing a commercial **shipbuilding industry** that has fallen into disrepair.

Generous **government support**, including tax incentives, would enable revitalized U.S. shipyards to fill orders that now go to facilities in China, South Korea or Japan, according to the administration. U.S. exporters also would be required to meet targets for shipping their goods on U.S.-flagged vessels, rising from almost nothing to 15 percent of the total in seven years.

But **maritime specialists** call hopes for a Lazarus-like **revival** of U.S. **shipbuilding** **unrealistic**, saying it would require **decades** of **consistent federal support**. Imposing **hefty fees** on **Chinese** ships now, before American-made alternatives exist, would only raise **freight costs** and **snarl global supply chains**, they said.

"It appears to be written by people who have absolutely no idea how the maritime supply chain works," said Lars Jensen, chief executive of Vespucci Maritime, a consultancy in Copenhagen. "The container lines will adjust and cut out the smaller ports. The consequence is going to be massive port congestion in the larger ports."

The **shipbuilding initiative**, which includes the creation of a new White House office, represents another element in Trump's frontal assault on trade orthodoxy. Coupled with his plans for the most extensive tariffs in nearly a century, it would reorient global commerce in an "America First" direction.

U.S. Trade Representative Jamieson Greer has proposed a complex menu of fees targeting Chinese ships, scheduled to be the subject of a public hearing by his agency on Monday.

One levy applies to each port call by a Chinese ocean carrier; a second would be assessed based on the percentage of Chinese-built ships in a carrier's fleet; a third depends upon the percentage of the carrier's future orders that have been placed with Chinese shipyards.

The measures are needed "to create leverage to obtain the elimination" of Chinese maritime industry dominance, USTR says, suggesting the president may be prepared to negotiate with Beijing.

If the new port fees are imposed, the three major ocean carrier alliances, which collaborate like airline industry partnerships, would probably try to avoid the extra costs by reassigning Chinese-made container ships from U.S. routes to serve Europe, analysts said.

Some vessels that would be subject to the fees could dock at Canadian or Mexican ports rather than unload at American wharves — costing American dockworkers and truck drivers.

Smaller carriers with long-term leases to operate Chinese-made ships could face ruin, said Hans Laue, president of Gisholt Shipping in Weston, Florida. Among those affected would be regional U.S. carriers that ply the waters between South Florida and gulf ports or Caribbean ports such as Jamaica, the Cayman Islands and the Dominican Republic.

"They have hundreds, if not **thousands**, of people working in the U.S., and they would be **immediately wiped out**," he said.

Some vessel operators already are trying to cancel contracts with some U.S. ports and delaying negotiations on new agreements "due to the uncertainty of costs associated with trading with the United States," Brett Bourgeois, executive director of the New Orleans Board of Trade, said in written comments on the USTR proposal.

Such upheaval in shipping schedules would have consequences for large and small ports. Container ships normally operate like waterborne buses, making scheduled stops at multiple ports along a coastline.

But facing fees that might reach $3.5 million for each stop, they would probably choose to unload all of their cargo in just one place, such as the Port of Los Angeles, executives said.

"You are absolutely going to disrupt the U.S. economy. You'll create covid-like congestion at places like L.A., Long Beach and New York," said Joe Kramek, president of the World Shipping Council, which represents the major ocean carriers.

Fewer vessels docking at smaller ports such as Oakland, California, would make it harder and more expensive for major U.S. exporters to ship their goods to foreign customers, and it would affect imports as well. Farmers who rely on bulk carriers to move grain and other commodities would be hit especially hard, forced to send their crops hundreds of miles overland to Southern California.

The proposed fees "will have catastrophic effects on U.S. exports," Kevin LaGraize Jr., president of Southport Agencies in Metairie, Louisiana, said in written comments submitted to USTR.

The fees are just one element in an eight-page draft executive order, titled "Make Shipbuilding Great Again" and obtained by The Washington Post, that the administration is finalizing.

U.S. shipyards in recent years typically delivered only a handful of commercial vessels each year, while China built hundreds. The draft executive order cites an "urgent need to reinvigorate the U.S. shipbuilding and maritime industries" and proposes a comprehensive menu of government aid, including the shipping fees and tariffs on Chinese cargo-handling gear.

According to a Feb. 27 draft, the president would ask Congress to establish a dedicated funding source for new shipbuilding ventures.

"We used to make so many ships. We don't make them anymore very much, but we're going to make them very fast, very soon," Trump said in his address on March 4 to a joint session of Congress.

The White House did not respond to a request for comment about the executive order.

The focus on shipbuilding has bipartisan support — a group of labor unions filed a petition seeking government help for domestic shipmakers during the Biden administration.

In January, just days before President Joe Biden left office, his administration's USTR endorsed the unions' complaint, concluding in a 182-page investigative report that the Chinese government had used generous state financing, forced technology transfer, intellectual property theft and discrimination against foreign firms to increase its dominance of global maritime markets.

China's share of global shipbuilding orders rose from less than 5 percent in 1999 to more than 50 percent by 2023, depriving U.S. shipyards of business and creating dangerous "**vulnerabilities** across the U.S. **economy**," the report said.

China's **shipbuilding supremacy** also has **military implications**. Even as relations with Beijing deteriorated, the U.S. Navy continued to purchase tankers and dry cargo carriers from Chinese shipyards, according to a 2023 Congressional Research Service report.

In a speech Tuesday, Vice President JD Vance cited the nation's shipbuilding decline as an example of deindustrialization that "poses risks both to our national security and our workforce." Vance contrasted the industry's performance during World War II, when shipyards turned out "three ships every two days," with its current annual output of just five ships.

"Revitalizing domestic shipbuilding is not only possible but also a priority," said Michael Wessel, a Washington consultant with ties to the United Steelworkers union. "The principal contributing factor to reduced capacity has been China's nonmarket pricing of ships. Order books have dried up. We have existing yards that can do more today, and we have facilities that can be brought online."

An **industry revival**, however, faces **numerous hurdles**. U.S. shipyards today have little **presence** in the **commercial market**, concentrating instead on producing **vessels** for the **Navy**. The only significant recent contract won by a U.S. shipyard came in 2022, when Matson, a Hawaii-based carrier, ordered three midsize container ships from the Hanwha Philly Shipyard in Philadelphia.

Matson, which serves domestic routes, needs the vessels to comply with the Jones Act, which requires that cargo moving between **two American ports** is carried aboard a **U.S.-built ship.**

The protectionist law, dating to 1920, helps explain why **U.S. shipyards** are so **uncompetitive**, analysts said. Matson paid roughly $330 million per ship, while Chinese shipyards offer similar vessels for just $60 million, according to Lloyd's List, a London-based industry publication.

Trump's widespread **imposition** of **import taxes**, including on materials used in shipbuilding such as steel, will only make the domestic industry less competitive in **global markets**, said Rob Willmington, a Lloyd's List analyst.

"China builds what the industry wants," he said. "You can go to them with your own design, and they'll do it and do it for 20 percent less than South Korea. What's missing is the **market** for **U.S. ships**."

Icebreakers alone can't rebuild the US shipbuilding industry.

Alistair **MacDonald 25**. Reporter for The Wall Street Journal in London, where he covers the defense industry and the Ukraine war. With Georgi Kantchev, foreign correspondent for The Wall Street Journal based in Berlin. "Trump's Arctic Goals Demand Icebreakers, But U.S.

Struggles To Build Them." Wall Street Journal. 2-5-2025. https://archive.ph/9lYMy#selection-5313.0-5313.73

At 13,000 tons, the U.S. Coast Guard's Polar Star is a mammoth vessel made to cut through Arctic ice more than 20 feet thick. But it is the U.S.'s only icebreaker that operates year-round, and it was built nearly half a century ago.

In the intensifying global race to access the Arctic, icebreakers are the essential tool to open trade routes, allow resource extraction and project military power. The U.S. and its allies have fallen far behind Russia, and China is rapidly gaining ground with the help of the world's largest shipbuilding industry.

President **Trump** has signaled that he wants to put the Arctic back at the top of the U.S.'s **priority list**. He has said the U.S. needs to take ownership of Greenland for national security and that the Coast Guard will expand its fleet of icebreakers.

"We're going to order about 40 Coast Guard big icebreakers. Big ones," Trump said last month.

That will be a **tall order** to **fill**. The U.S. has been struggling for years to build a **single icebreaker**—vessels that **clear a path** through the **ice for other ships**. Even if **Trump** is able to **marshal** the **political will** and **money** to **build more,** the U.S. **will have** to **breathe life back** into its **ailing shipbuilding industry**, which has been in decline for decades.

Russia, meanwhile, has around **40 icebreakers**, as well as new giant nuclear-powered ones under construction. Despite being 900 miles from the Arctic Circle, China has four such vessels. Its first domestically built nuclear-powered icebreaker could be unveiled as soon as this year, experts say.

Russia has faced setbacks in recent years. Sanctions over the Ukraine war have limited its access to components and technologies needed to build icebreakers, such as propulsion systems and radar equipment. A nuclear-powered icebreaker under construction called Rossiya is running three years behind schedule. But it already has a massive lead and years of experience operating in the Arctic.

As in other areas, Russia is tapping China's investment and technological support, potentially fueling Beijing's increased interest in the polar regions. It took a Chinese shipyard two years to deliver one **recent icebreaker**. Though the U.S.'s new icebreaker will be a heavier ice-breaking class than the Chinese vessel, construction started only recently, five years after the contract was awarded to build it.

Workforce shortages make effective shipbuilding impossible.

Svetlana **Shkolnikova 25**. Reporter at Stars and Stripes. "Higher pay for shipyard workers critical for military shipbuilding revival, experts say." Stars and Stripes. 3-11-2025. https://www.stripes.com/branches/navy/2025-03-11/navy-shipbuilding-workforce-17109011.html

The **resurrection** of **military shipbuilding** in the U.S. will **hinge** on **improving wages** and **benefits** for **workers at shipyards**, Navy officials and experts said Tuesday as lawmakers raised fears of cuts to shipyard workforces.

Experts testifying before a House Armed Services Committee subpanel cited labor shortages due to poor pay as the main reason for the **Navy's yearslong struggle** to build **ships** on **time** and on budget.

Cost overruns for 46 ships that the Navy has under construction grew from $3.4 billion to $10.4 billion in the past budget year while delays for certain naval vessels have stretched up to three years.

"Nothing is more important than **addressing** the **critical labor shortages** that afflict all of the **shipbuilding** and **public maintenance yards**," said Eric Labs, a senior analyst for naval forces and weapons at the Congressional Budget Office.

The assessment comes as President Donald Trump's administration seeks to **revitalize commercial** and military **shipbuilding** to compete with China while also substantially reducing the Defense Department's civilian workforce.

TURN- Nuclear Bad

Nuclear powered ships are bad and risk accidents.

George M. **Moore 24**. Scientist-in-residence at the James Martin Center for Nonproliferation Studies at the Middlebury Institute of International Studies at Monterey. "Why nuclear-powered commercial ships are a bad idea." Bulletin of the Atomic Scientists. 9-5-2024. https://thebulletin.org/2024/09/why-nuclear-powered-commercial-ships-are-a-bad-idea/

But the post-9/11, post-Three Mile Island/Chernobyl/Fukushima world is vastly different from the 20th century political and social environment in which the first generation of nuclear ships were developed. Even if economic issues can be overcome with newer, cheaper technologies and increased carrying capacity of either cargo (as China apparently thinks their mega-container ship will do) or passengers (as some commentators have suggested), making **nuclear-powered ships economical**, the **security** and **safety concerns**, real and imagined, would far outweigh the benefits of **nuclear power**. There are real **nuclear security risks** and **safety concerns** associated with **nuclear-powered commercial ships**. And even if those concerns seem reasonable to those with sufficient technical background to evaluate these risks, the **public perception** of these risks would likely **pose an all-but insurmountable barrier.**

One does not have to imagine the Somali pirates capturing a nuclear-powered ship to be aware that the ships could be a significant terrorist target, both in port and at sea. In contrast to military nuclear-powered ships, which maintain arguably significant security protections, **commercial ships** and shipping facilities are afforded relatively **little security protection**. Even if the public accepted the use of nuclear-powered ships in their ports, in all probability expensive security measures would be needed for operations to be considered reasonably safe from terrorist attacks. Overcoming these concerns would pose significant financial burdens on the vessel operator and port facility and would limit the number of ports where nuclear-powered ships could dock.

Second, the potential for a reactor accident, albeit low, must **be considered**. Proponents argue that use of new fuels such as TRi-structural ISOtropic (or TRISO) pellets, which the Energy Department claims to be the most robust nuclear fuel ever created, and concepts such as low-pressure molten salt reactors make the spread of **contamination** from an **accident** far less likely than was the case with the high-pressure, water-cooled reactors that are used in use in military naval ships. Such arguments tend to ignore one fact: **Commercial ships** are **surrounded by** water. If there is leakage, waterborne contamination that could be **extremely difficult** to **contain**, potentially **threatening expanded areas** and **raising concerns about**, for example, **commercial fishing**.

Nuclear propulsion of commercial shipping also creates **unique risks**. In contrast to military vessels designed to resist damage, commercial ships are relatively thin-skinned and not nearly as **damage-tolerant** as **military hulls**. In addition to the risk of terrorist or wartime attacks, nuclear-powered commercial vessels face the risks of collision, grounding, and weather-related damage.

Nuclear accidents cause existential contamination.

David **Krieger 96**. Founder and president, Nuclear Age Peace Foundation, chair of the Executive Committee, International Network of Engineers and Scientists for Global Responsibility, councilor and co-chair of the Peace and Disarmament Commission, World Future Council, written or edited 23 books and hundreds of articles and book chapters. 3-12-1996, “Denuclearization of the oceans: linking our common heritage with our common future.”

http://www.wagingpeace.org/denuclearization-of-the-oceans-linking-our-common-heritage-with-our-common-future/

Accidents aboard **nuclear sub**marine**s** have caused a number of them to sink with long-term **adverse environmental consequences for the oceans**. In addition to accidents, many countries have purposefully dumped radioactive wastes in the oceans. With regard to proper stewardship of the planet, it is time to raise the issue of denuclearizing the world's oceans. To fail to raise the issue and to achieve the denuclearization of the oceans is to abdicate our responsibility for the health and well-being of the oceans and the planet. Nuclearization of the Oceans Nuclearization of the oceans has taken a variety of forms. The primary ones are: 1. the oceans have served as a medium for hiding nuclear deterrent forces located on submarines; 2. nuclear reactors have been used to **power ships**, primarily submarines, some of which have gone down at sea with their **nuclear fuel** and **nuclear weapons** aboard; 3. increasing use is being made of the oceans for the transportation of nuclear wastes and reprocessed nuclear fuels; 4. the oceans have been used as a dumping ground for nuclear wastes; 5. atmospheric nuclear weapons testing, particularly in the Pacific, has been a source of nuclear pollution to the oceans as well as the land; and 6. underground nuclear weapons testing, such as that conducted by France in the South Pacific, has endangered fragile Pacific atolls and caused actual nuclear contamination to the oceans as well as risking a much greater contamination should the atolls crack due to testing or future geological activity. The problems arising from nuclearization of the oceans can be viewed from several perspectives. From an environmental perspective, issues arise with regard to nuclear contamination in the oceans **working its way up through the food chain**. The biological resources of the oceans will eventually **affect human populations** which are reliant upon these resources. The threat of nuclear contamination has diminished with regard to nuclear testing, which has not taken place in the atmosphere since 1980. Moreover, the nuclear weapons states have committed themselves to a Comprehensive Test Ban Treaty, which they have promised to conclude by 1996. This treaty, if concluded, will end all underground nuclear testing. The dumping of high-level radioactive waste material was curtailed by the Convention on the Prevention of Marine Pollution by the Dumping of Wastes and Other Matter, which entered into force in 1975. A later amendment to this Convention prohibited ocean dumping of all radioactive wastes or other radioactive matter. However, exemptions authorized by the International Atomic Energy Agency and non-compliance remain a concern. Problems can be anticipated in the future when radioactive contaminants already dumped in canisters or **contained in fuel or weapons aboard sunken sub**marine**s breach their containment**. Increased use of the oceans to transport nuclear wastes and reprocessed nuclear fuel (between Japan and France, for example) has substantially increased the risk of contamination. Coastal and island states that are on the route of the transportation of nuclear materials stand **high risks of contamination** in the event of an accident at sea. International law regarding the transportation of hazardous material must be strengthened and strictly enforced by the international community to prevent **catastrophic accidents** in the future. From a human rights perspective, inhabitants of island states in the Pacific have suffered serious health effects and dislocation as a result of atmospheric and underground nuclear weapons testing. In response to assurances by France that their underground testing in the South Pacific is entirely safe, the islanders in Polynesia and throughout the Pacific have retorted: If it is so safe, why isn't it being done in France itself? The response of the French government has been that French Polynesia is French territory, highlighting the arrogance and abuse that accompanies colonialism. Human rights issues also arise with regard to maintaining a nuclear deterrent force that threatens the annihilation of much of humanity. The Human Rights Committee stated in November 1984 in their general comments on Article 6 of the International Covenant on Civil and Political Rights, i.e., the right to life, that "the production, testing, possession, deployment and use of nuclear weapons should be prohibited and recognized as crimes against humanity." The deployment of nuclear weapons on submarines, therefore, arguably constitutes a crime against humanity, and thus a violation of the most fundamental human right, the right to life. From a security perspective, the nuclear weapons states argue that having a submarine-based deterrent force assures their security. Thus, to varying degrees, each of the nuclear weapons states maintains strategic submarines capable of causing unthinkable destruction if their missiles were ever launched. (See Appendix.) Viewed from the self-interests of nearly all the world's population-except the nuclear weapons states whose leaders appear addicted to maintaining their nuclear arsenals -the continued reliance on nuclear deterrence, at sea or on land, poses a frightening threat to continued human existence. In 1972 the Seabed Agreement prohibited the emplacement of nuclear weapons on the seabed, ocean floor, or subsoil thereof. This agreement prohibited what was already deemed unnecessary by the nuclear weapons states; placing nuclear weapons on submarines made them less vulnerable to detection and destruction than placing them on or beneath the seabed or ocean floor. The oceans continue to be used by the nuclear weapons states as an underwater shadow world for their missile carrying submarines. The United States alone currently has 16 Trident submarines, each carrying some 100 independently targeted nuclear warheads. Each Trident submarine has a total explosive force greater than all the explosive force used in World War II, including at Hiroshima and Nagasaki. Britain, with the help of the United States, is replacing its older class of Polaris SSBNs with a fleet of four Trident submarines. France currently has five strategic missile submarines with four more of a superior class to be commissioned by 2005. Russia has over 35 strategic missile submarines with an estimated capacity of 2,350 nuclear warheads. China has two modern ballistic missile submarines. Its Xia class submarine carries twelve 200 kiloton nuclear warheads. The total destructive force that day and night lurks beneath the oceans is a chilling reminder of our technological capacity to destroy ourselves. That this threat was created and is maintained in the name of national security suggests a collective madness that must be opposed and overcome if, for no other reason, we are to fulfill our obligation to posterity to preserve human life. An ongoing responsibility resides with the nuclear weapons states to fulfill the obligations set forth in Article VI of the Non-Proliferation Treaty (NPT), "to pursue negotiations in good faith on effective measures relating to cessation of the nuclear arms race at an early date and to nuclear disarmament, and on a treaty on general and complete disarmament under strict and effective international control." At the NPT Review and Extension Conference in April and May 1995, the treaty was extended indefinitely after extensive lobbying by the nuclear weapons states. At the same time the nuclear weapons states promised to enter into a Comprehensive Test Ban Treaty by 1996, and to engage in a "determined pursuit" of the ultimate elimination of their nuclear arsenals. Protecting the Common Heritage The Law of the Sea Treaty enshrines the concept of the oceans as the common heritage of [hu]mankind. Maintaining the oceans as a common heritage demands that the oceans be protected from contamination by nuclear pollutants; that they not be used in a manner to undermine basic human rights, particularly the rights to life and to a healthy environment; and that the oceans not be allowed to serve as a public preserve for those states that believe their own security interests demand the **endanger**ment of global **human survival**.

US deployment of nuclear-powered ships risks accidents and nuclear confrontation.

Joseph **Trevithick 20**. Deputy Editor at The War Zone. "Trump Orders Coast Guard To Look Into Building Nuclear-Powered Icebreakers Like Russia." War Zone. 6-9-2020. https://www.twz.com/33971/trump-orders-coast-guard-to-look-into-building-nuclear-powered-icebreakers-like-russia

At the same time, **nuclear propulsion** is **costly** and **complex**, and employing it on icebreakers could raise concerns about potential **operational** and **environmental risks** for **ships** that will be primarily operating in regions well known for experiencing extreme weather. Environmental activists have long expressed these concerns with regard to **Russia's nuclear icebreaking fleets**, as well as its **new floating nuclear powerplants**. Taymyr alone has suffered a number of radiation leaks over the years.

There is also the possibility that future nuclear-powered Coast Guard icebreakers could find themselves in **aggressive confrontations** with **Russian** or **other countries'** ships, **especially** in the **Arctic region**. This is what is certainly driving the demand to explore potential defensive armament for America's next icebreakers.

Nuclear contamination from an icebreaker accident would be devastating, undermining life in the Arctic.

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The third risk is linked to a potential **nuclear shipping incident**. Expanding LNG exports from the Yamal Peninsula have been accompanied by a large increase in nuclear-powered icebreaker escorts.[32] In 2019, nuclear-powered icebreakers accompanied a total of 510 vessels, an increase of 54 percent compared to 2018.[33] With global warming, regular commercial shipping in the Arctic will increase the likelihood of accidents triggered by extreme weather and climate events, such as stronger winds, storms, and higher waves. One plausible incident scenario involves a collision of a foreign-owned **LNG tanker** and Russian **nuclear-powered icebreaker** escort in a winter storm, with a serious potential for **release** of **radioactive contaminants**.[34] The recent oil spill in Norilsk, caused by the erosion of the surrounding permafrost, illustrates the considerable risks that increasing economic activity can have on the regional environment, as well as the catastrophic effect climate change is having in the Arctic.[35] Ecological issues can, in turn, accelerate disease spread and have detrimental effects on human health.

Moreover, given the increased levels of submarine activity in the Barents Sea – by both Russia and NATO member states – **a serious incident** or **accident involving nuclear-powered** submarines or military vessels carrying nuclear weapons is **practically unavoidable**. One only needs to recall the 2009 collision of French and British submarines in the Atlantic, which raised questions about the safety of ballistic missile submarines patrolling the oceans while hiding their position.[36] While a submarine accident in the deep ocean arguably carries fewer risks – owing to the massive dilution of radioactivity – a submarine **collision** in the **shallow waters** of the Barents Sea is an **unknown scenario** with **potentially disastrous consequences**.

The presence of **radiological** and **nuclear material** poses a serious threat to the Arctic **marine environment** and **industries**, including **fisheries** and **local food sources.**[37] Fishing is one of the most

important industries in the Arctic, representing large shares of gross domestic product (GDP) in some countries (e.g. 8.1% in Iceland).[38] In the case of Norway, a big share of exports come from the Arctic in the form of seafood. Any rumour of **leaking spent fuel** – let alone an actual nuclear incident – could be devastating to the **country's market** and **seafood sales**.[39]These and other concerns have prompted Norway and other Arctic states to cooperate with Russia in the field of nuclear and radiation safety.

The above-mentioned risks are further compounded by the fact that the Arctic currently lacks multiple facets of both operational and research infrastructure that is needed to provide key elements of both short- and long-term response to a major nuclear release incident.[40]

Oceanic nuclear pollution causes extinction.

Quamrul **Haider 19**. Professor of Physics at Fordham University. "Our oceans: The ultimate sump." June 2019. http://www.ipsnews.net/2019/06/oceans-ultimate-sump/

It is **highly likely** that radioactive wastes would eventually **leak** out of the containers because of **poor insulation**, **volcanic activity**, **tectonic plate movement** and several other geological factors. Indeed, last month, UN Secretary General Antonio Guterres confirmed that a Cold War era concrete "coffin" filled with nuclear waste is leaking radioactive material into the Pacific Ocean. Since radiation from nuclear wastes remains active for **hundreds of thousands** of years, their dangerous effects will **linger** for a long time and will have **lethal impact** on marine life.

Furthermore, six **nuclear submarines**—4 Russian and 2 American—lost as a result of accidents are lying at the bottom of the oceans. They represent **serious threat** of radioactive contamination of the oceans, too.

One of the biggest contaminations due to radiation was caused by a series of nuclear tests conducted by the USA on the sea, in the air and underwater at Bikini Atoll in the North Pacific between 1946 and 1958. The French nuclear tests carried out during 1966-1996 in French Polynesia are responsible for other cases of intense radioactive pollution of marine ecosystems.

Clearly, we are using the oceans as the **ultimate sump**, partly because their very immensity seems to preclude any long-term effect, and partly because they belong to no one. This **cannot continue indefinitely** because in order for us to **survive**, we have to **protect the oceans**. Lest we forget, life **emerged** from the oceans and the source of most of the **oxygen** we breathe are the oceans. They have been an endless source of inspiration to humankind.

AT: Military Power Advantage

The Coast Guard has no use for nuclear icebreakers.

Malte **Humpert 20**. Senior Fellow and Founder of The Arctic Institute. "U.S. to Speed Up Its Icebreaker Program, May Develop Nuclear Arctic Vessels." High North News. 6-11-2020. https://www.highnorthnews.com/en/us-speed-its-icebreaker-program-may-develop-nuclear-arctic-vessels

Similarly, the suggestion to develop a **nuclear icebreaker program** raised eyebrows in the **Arctic community**. **Russian nuclear icebreakers** serve a very specific purpose, namely **escorting** commercial ships along the **Northern Sea Route**. These types of **powerful icebreakers** would be of **little use** to the U.S. Coast Guard and would be **prohibitively expensive** to **develop** and **maintain**, experts suggest.

Naval power doesn't solve war and shipbuilding alone can't make it effective.

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Naval forward presence — the practice of maintaining combat-credible naval forces worldwide to **deter adversaries**, **reassure allies,** respond to crises, and perform constabulary functions for the global commons — has dominated U.S. foreign policy since the 1990s. Few critics dare question it. The concept's supporters — under the illusion that "credibility anywhere is credibility everywhere" — darkly warn that rolling back presence operations **will embolden America's adversaries**.

The opposite is true. A **navy tasked to do all** these things **cannot do them all well.** Rolling back presence **will strengthen**, not **weaken**, **deterrence**. For too long, short-term thinking has taken priority over managing long-term risk. It's time to flip the script. Readiness for **great-power conflict** — peace through strength rather than global policing — should once again be America's **primary grand-strategic aim**.

Too Busy, and Too Small

Few Americans appreciate just how busy their navy is. At any time, over one-third of U.S. Navy ships are deployed — the greatest proportion in history. Sometimes these ships are training with allies and partners, buttressing American power. Sometimes they are responding to crises where legitimate American interests are at stake and force may be necessary. But many of the Navy's overseas duties are unrelated to coercion or deterrence, including humanitarian operations, freedom of navigation transits, "maritime security" patrols in far-flung regions, or various missions under the nebulous banner of norms enforcement.

As my research has shown, these **operations** come at a **cost**: They have **shrunk** and **weakened** the U.S. Navy's **surface fleet** to a shadow of its former self. The reasons lie in politics, poor strategic foresight, and bureaucracy. While critics usually describe the problem as a mismatch between operational "demand" and the "supply" of ships, this mismatch is itself a symptom of an underlying national confusion about the purpose of the Navy itself. The hard truth is that stale ideas about America's proper role in the world have outlived the geopolitical circumstances in which they germinated.

After the Soviet Union dissolved, U.S. policymakers saw a new world marked by brush-fire conflicts, civil wars, and economic dislocation due to globalization. Global policing, albeit under more the palatable terms like "engagement" or "liberal internationalism," became the dominant foreign policy consensus. To offer flexibility for these brush fires, the Navy designed its fleet around carrier strike groups and amphibious readiness groups. The Navy made this case — that an uncertain world required presence, and presence required carriers, amphibious ships, and supporting multi-mission combatants — in its own planning documents, and led a public relations campaign to this effect. The 1993 Bottom-Up Review (the Department of Defense's seminal assessment of required force structure for the post-Cold War era), under a section entitled "naval presence," explicitly stated that naval forward presence would require more large-deck ships than the Navy would need if it used the same force-planning metric as the other services (the two "major regional contingency" standard). In other words, "presence" as an idea was good for the Navy's bottom line — at first.

Circumstances soon changed. First, the large, exquisite ships that carrier strike groups and amphibious readiness groups required were expensive. Over time, this drove up customer costs and lifecycle costs, and inhibited alternative force structures and platform choices, because the coalition of contractors and policymakers benefiting from the presence-oriented force structure objected to changes. Accordingly, with time, the Navy purchased fewer vessels overall, and the fleet began to shrink.

Meanwhile, the U.S. military's geographic combatant commanders — empowered a few years earlier under the 1986 Goldwater-Nichols Act — began demanding surface ships for nearly every crisis that arose in their theaters. Policymakers, too, grew accustomed to "showing the flag." Sending a carrier strike group to a hot zone was appealing, as it avoided the political risk and financial cost of overseas basing and was an easy way to ratchet diplomatic pressure up and down.

In essence, the Navy did its job too well: It designed a fleet and promoted a concept for operating it that policymakers and combatant commanders found addictive. So, throughout the 1990s and into the 2000s, the surface fleet got busier and busier while becoming smaller and smaller.

Like a car, a ship can only be run so hard until it becomes too expensive to maintain. As the Navy overused its ships, they retired early. Other ships picked up their slack and were then overused themselves. To support the rising tempo of operations, the Navy repeatedly delayed maintenance on ships. America's shipyards, which required predictable contracts to remain economically viable, bled skilled laborers, driving up costs in an endless cycle.

The result was that the surface fleet shrank from over 400 ships in 1994 to an all-time-low of 272 vessels during the Obama administration (today, it sits at around 300). Even with an ongoing multi-decade, multi-billion-dollar investment in the nation's public shipyards, the U.S. Navy will not clear its maintenance backlogs until at least 2040. Even the chief of naval operations recently acknowledged that the fleet will not grow any time soon. Wargames indicate that, were the United States to fight China, the U.S. Navy might eke out a **nominal win**, but one that **blurs** the **line** between victory and defeat, setting back **American military power** for a **generation**.

The Readiness Trade-Off

How was all this allowed to happen?

Everyone, from the combatant commanders to the Navy, lost sight of the trade-off between operational and structural readiness. “Operational” readiness refers to the ability of existing military units to fight tonight. “Structural” readiness refers to a military’s ability to generate sufficient mass for multiple rounds in a prolonged fight, including factors like the health of the defense-industrial base. In basic terms, an extremely high level of operational readiness is required for global policing duties; whereas if the goal is fighting a long war against a peer competitor, structural readiness is more important. If resources are finite (which they always are), the two trade off.

In brief, for three decades, the U.S. Navy traded its structural readiness (for great-power conflict) for **operational readiness** (to support naval forward presence). It burned through its **ships**, and **debilitated its shipyards**, to make sure it could respond to whatever policymakers wanted, whenever they wanted it, no matter how irrelevant it was to **deterrence** and **warfighting**.

This was not a problem in the 1990s, when the same fleet busy with presence operations could still fight off any foreseeable challenger. But by 2015, given the rise of China, the Navy, oversight agencies, contracted research organizations, and think tanks were all sounding alarms. Navy leaders begged Congress, time and again, to reduce the frequency with which Navy ships were deployed, so that the force could recoup its readiness.

Then came the collisions. In 2017, two U.S. Navy destroyers, in separate incidents, crashed into commercial ships, and 17 American sailors lost their lives. Two investigations — Secretary of the Navy Richard V. Spencer’s Strategic Readiness Review and Chief of Naval Operations John M. Richardson’s Comprehensive Review — offered recommendations to restore the Navy’s readiness. The Navy’s highest-level investigation even recommended “condition[ing] congressional and executive branch leaders to accept that the higher cost and time to achieve established readiness standards will mean less Navy presence worldwide.” This never happened, because Congress continued to assume the Navy could balance both operational and structural readiness, as my research delineating the hearings after the accidents has shown.

Legislation passed after the collisions resolved none of the Navy’s presence-induced headaches. Congress enacted reforms to restore operational readiness but ignored the Navy’s proposed reforms to improve its structural readiness. The Strategic Readiness Review had proposed changes to the Navy’s readiness commands (such as eliminating the so-called “Inouye Amendment”) and changes to the adjudication of combatant commanders’ requests for forces. Instead, what the Navy got was a little more officer training here, some sleep requirements for officers there. After dipping for one year after the collisions, the Navy’s operational tempo continued its inexorable annual rise that began in the 1990s. Presence was simply too popular an idea.

Shipbuilding is Not Enough

The U.S. Navy’s **readiness** for **sustained combat** — and hence its **ability** to deter China — is in a **catastrophic state**. The Trump administration should give the U.S. Navy a fighting chance to rebuild itself.

It can start with the unfinished business of 2017, reforming the global force management process (the process by which the Department of Defense adjudicates combatant commanders’ requests for military forces) to prioritize structural readiness over emergent demands. In this process, the service chiefs and the joint staff consider combatant commander needs in their theaters and recommend service assets that can be made available to them. Should a combatant commander need forces in excess of this established allocation (an “emergent requirement”), he or she can submit a “request for forces.” The idea that the services should “just say no” to such requests is aspirational, but difficult. Why? Because — as the Strategic Readiness Review noted — the Navy has developed a culture of meeting non-stop (presence-driven) operational demands.

As the review also points out, the multiple overlapping authorities and the adverse growth of staffs within the Navy has made tracking the long-term effects of operations on **structural readiness** a **nightmare**. In addition, the staff of the chief of naval operations, located in the Pentagon, appears biased towards operational demands and can lose sight of long-term readiness. The problem is not that the Navy lacks input in global force management, but that the Navy still does not “say no” enough. To resolve this, the review recommended establishing the initial force availability as the “maximum supportable peacetime force,” such that any further combatant commander requests for forces can only be met with forces moved from other theaters. This is, in essence, a hard cap on what the Navy can do, ensuring that unready units are never sent to meet the latest and greatest combatant commander request.

But emergent demands aside, Navy operational tempo will still **remain too high** to restore **structural readiness**. The **Trump** administration should therefore reevaluate the idea of **naval forward presence** itself: the notion that America’s Navy is foremost a provider of global goods, and a global policeman, rather than the preeminent warfighting force of a maritime power whose primary goals ought to be deterring — and if necessary, winning — a great-power conflict.

Naval deterrence doesn’t solve war.

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https://warontherocks.com/2021/02/dont-knock-yourself-out-how-america-can-turn-the-tables-on-china-by-giving-up-the-fight-for-command-of-the-seas/

The United States should **give up its quest** for command of the maritime commons in the Western Pacific. The struggle is based on a **false premise** — that if the United States loses command of the seas, China will **step in** the fill the vacuum. In fact, **even if** the United States loses command of the maritime commons, China is **not positioned** to gain it. However, by positioning China as an existential threat, the United States is boxing itself in politically. The United States **courts disaster** when it **overextends itself** by seeking military primacy in the region. There is one fundamental reason: **the tyranny of distance**. The **maritime** nature of American **power** is a **double-edged sword**, specifically when it comes to its competition with China. American command over the maritime commons allows the U.S. military to project power globally, but when that power is projected at a **great distance** from U.S. shores, as in the Western Pacific, U.S. forces are particularly **vulnerable** to measures designed to **raise the costs of access**. First, a strategy of maintaining command of the maritime commons in the face of anti-access measures exposes U.S. dependence on allied territory to support deployed forces through basing, infrastructure, and logistics. Second, as the costs and risks of maintaining access increase, the **asymmetrical stakes** become **more constraining** for the United States than for China. Overcommitment has historically been endemic to U.S. grand strategy, but it is especially **dangerous** now that China is capable of inflicting heavy costs upon the United States. Instead, the United States should, together with its allies and partners, focus on denying China command of the Pacific maritime commons. It is **cheaper** and **easier** to **deny** command of the seas than to exercise it. If China cannot gain command of the seas, the Western Pacific will **remain** a contested environment — one that China **cannot break out of**. China would either be forced to **accept the status quo** or make a first move in which it **overextends itself**. While giving up command of the seas may seem unpalatable, it **need not be fatal** to the United States and its allies and partners' collective goal to maintain the regional balance of power. The alternative is unlikely to end well for them.

But if it does solve war, then it's resilient.

Gregg **Easterbrook 18**. Fellow in Economics, then in Government Studies, at the Brookings Institution, and a Fellow in International Affairs at the Fulbright Foundation, February 2018, It's Better Than It Looks: Reasons for Optimism in an Age of Fear, Chapter 6: Why is Violence in Decline?, p. 136-139

FROM BEFORE THE COMMON ERA until Pearl Harbor, great powers competed at sea as much as on land. Carthage, Rome, and Troy fought regularly on the waters of the Mediterranean. Enormous fleets—the 1588 Spanish Armada boasted 130 ships—plied the oceans, fighting other fleets, seizing prizes, and staking claims to territory. Even in the days of sail, warships crossed the world: early in the sixteenth century, the Chinese and Portuguese navies clashed repeatedly near what's now Hong Kong. For millennia, nations sunk into their navies amounts that might have ended want, only to behold the investments literally sink. During the modern era, Argentina, Brazil, Britain, Chile, France, Germany, Japan, Russia, and the United States have expended groaning chests of treasure on warships. Naval rivalries between Britain and Germany helped ignite both world wars. The Pacific Theater fighting of World War II began in part because of America's 1940 decision to forward-deploy its fleet from California to Hawaii, closer to Tokyo, and in part because Japan placed an existential wager on the maritime theories of Alfred Thayer Mahan, a member of the society of famous persons who proved, following their deaths, to have been wrong about practically everything. Many centuries of an extravagant naval arms race culminated in the October 1944 Battle of Leyte Gulf, where 367 warships and 1,800 aircraft hammered at each other with cannon, bombs, torpedoes, and battleship shells weighing up to 3,000 pounds apiece. Then the **naval arms race stopped. So did naval fighting**. The **seas have been quiet** for nearly **seventy- five years**, perhaps the longest stretch without bloodshed on the waters since first the sail was hoisted. Some Argentine and British ships clashed during the 1982 Falklands conflict, and Iranian and Iraqi vessels scuffled around oil tankers during the mid- 1980s, but **big fights at sea have**

come to a halt, as has the **great-power naval competition**. The last time a major naval battle occurred, India was not yet an independent nation, the solid-state transistor had not been invented, and the Dodgers played in Brooklyn. Century upon century of great-power competition at sea ended with a **final score of 10—0**. That's the number of supercarrier strike groups possessed by the **U**nited **S**tates (ten) versus the number possessed by **all other** nations combined (zero). World War II left the warships of the Axis powers in Davy Jones's locker. The Soviet Union tried to step in with bucket-of-bolts vessels that craved return to port; since about 1960, the US Navy has **enforced hegemony over the blue water**. "Hegemony" has a bad reputation in political science, assumed always to be undesirable. In this case, the **size**, **power**, and **competence** of the US Navy has **banished fighting** from much of Earth's surface. For a **half-century**, **no nation has even attempted to contest US naval dominion**. The all-electric, stealth- hull cruisers the United States builds are so advanced —nicknamed "arsenal ships" for their firepower—that no other nation has even experimented with a vessel of this general type. The supercarrier strike groups that America deploys—full-deck, nuclear-powered carriers bearing long-range jets, protected by guided-missile destroyers and screened by nuclear submarines—are so potent, to say nothing of so expensive (naval hegemony cost the United States $155 billion in 2017), that no other nation has tried to build one. **China** and **Russia possess no nuclear supercarriers**, and have **none under construction**. The limited-deck, diesel-powered carriers China began laying down in 2015 will be suitable for patrolling coastal areas but not for the open ocean, while everything the US Navy builds is intended to travel beyond the horizon. Because the US Navy operates far from the homes of Americans, many are not attuned to its size and might. Soldiers can march in Fourth of July parades, and Air Force fighters can perform Super Bowl flyovers; the Navy's boats can be observed only on the waves. Most who live in other nations are not attuned to the US Navy either. There's no compelling reason to think about a well-behaved military force stationed on the opposite side of the globe. Under US Navy hegemony, piracy still occurs, but great powers have not seized merchant ships in three generations. That cargo ships whose decks are stacked with containers of valuable goods can steam anywhere without fear of being impounded by a warship is the unseen reason global trade took off, and global trade benefits almost everyone, while reducing war. The reality that the US Navy rules the blue water both **reduces a historic cause of conflict** and **enables the prosperity of the contemporary era**. Speaking at West Point as president, Obama said that the United States does not use its might to acquire territory or seize resources. Instead, American might is employed to pursue what US leaders believe is best for the world. Such beliefs may be wrong, even tragically so. But has any other nation that possessed overwhelming military force ever refrained from using force for conquest or pursuit of riches? That is the unseen question of the oceans—unseen because fighting on the water has stopped.

Naval readiness is already high now.

Ryan **Finnerty 23**. Americas defence reporter for FlightGlobal.com and Flight International magazine, covering military aviation and the defence industry. Former United States Army officer and previously reported for America's National Public Radio system in New York and Hawaii covering energy, economics and military affairs. "US Navy touts record F/A-18 mission-readiness rate." FlightGlobal. 8/14/23. https://www.flightglobal.com/fixed-wing/us-navy-touts-record-f/a-18-mission-readiness-rate/154533.article

More than **80%** of US Navy (USN) Boeing F/A-18 Super Hornet strike fighters are **currently deemed mission ready**, a dramatic turnaround from **significantly lower** readiness rates reported less than a decade ago. The navy had reached the 80% rate for the twin-engined fighter and the related EA-18G electronic-warfare variant in 2019. But the service has been able to maintain its 80%-readiness target, service officials said earlier this month. On 3 August, those officials **touted** the jets' **continued high mission-ready rate**, which comes after the USN for several years pursued a **concerted effort to improve readiness** for an aircraft it describes as the "backbone" of its fighter fleet. US Navy Super Hornets until recently fleet suffered from precariously low readiness levels, owing to budget restrictions, high operational demands and an outdated maintenance system The 80% mission-readiness rate contrasts sharply with the reality just a few years earlier. In 2017, fewer than 50% of the navy's F/A-18s and

EA-18s were ready to fly. According to Cirim data, the USN had 416 E/F-model Super Hornets in active service at the start of 2023, and 152 EA-18Gs. Senior leaders in the USN are heaping praise on one officer – Captain Jason Denney – for overseeing the change. Denney took command of the navy's F/A-18 and EA-18G programme office in 2019. Known as PMA-265, the office manages acquisition, delivery and sustainment of the two aircraft for the service. The year earlier, then-defence secretary James Mattis had mandated that all fighter types in the US inventory achieve readiness rates of 80% or greater before the US government's fiscal year 2019 ended in September of that year. During Denney's tenure, which concluded on 3 August, the USN F/A-18 programme office rolled out a series of reforms called the Naval Sustainment System-Aviation (NSS-A) – a programme meant to **address maintenance failings** and to help the **service meet the 80% goal**. The navy describes NSS-A as a "**data-informed**" framework that seeks to "**increase spare parts**, **enhance capability** and **maintain** aircraft at a faster rate". The improved logistics system, combined with increasing defence budgets in recent years and an end to most active-combat operations in the Middle East, appear to have produced results. Speaking at the 3 August ceremony in which Denney handed over command of PMA-265, Vice Admiral Francis Morley praised the Super Hornet pilot's role in the transformation, noting the F/A-18 was the only platform to reach the 80% readiness target by the end of FY2019. Denney "pioneered the NSS-A model, and this year surpassed **full-mission capable readiness rates** for the first time in the history of the programme", Morely says. The uniformed advisor to the assistant secretary of the navy for research, development and acquisition also notes the NSS-A changes reduced the per-aircraft maintenance cost by half for each F/A-18. In written remarks, secretary of the navy Carlos Del Toro says Denney was "instrumental" in developing the new sustainment framework, which is now being used **across the navy.** The improvements in F/A-18 readiness **appear to be lasting**. The navy first reported surpassing the 80% threshold in 2019, and senior admirals at the 2023 Sea Air Space conference April confirmed publicly that 372 Super Hornets were mission capable at the time.

The US navy is comparatively more ready.

Takagi **Masaru 23.** Correspondent at NHK. "US Navy chief says maritime forces are in "a high state of readiness." 8/2/23. https://www3.nhk.or.jp/nhkworld/en/news/backstories/2632/

Admiral Michael Gilday, Chief of Naval Operations, oversees more than **300 ships** and **350,000 service members**. He is the top-ranked uniformed officer in what is considered to be the **world's strongest maritime force.** This interview, conducted on July 11, has been edited for brevity and clarity. On a possible contingency in Taiwan Takagi Masaru: US intelligence officials, including CIA Director William Burns, have said Chinese President Xi Jinping has instructed his military to be ready to invade Taiwan by 2027. What is your view on this? Admiral Michael Gilday: We take statements like that very seriously. We have a great deal of respect for the trajectory that the PRC has been on with respect to modernizing their capabilities and their forces, not just their conventional forces, but also their nuclear forces, their space forces, and their cyber forces. I think it's important that we maintain **a high state** of readiness today, and at the same time continue to modernize our collective forces — not just the United States, but Japan and other allies and partners. We must be ready for 2027, 2030. We must be ready every single day. It's our duty to be ready and to have a force that's capable of prevailing, but our focus is on deterring that conflict from ever happening. Takagi: In June, a Chinese navy vessel cut sharply across the path of an American destroyer, forcing it to slow to avoid a collision. Why do you think the Chinese conducted such a dangerous maneuver? Gilday: It was dangerous. We characterize that maneuver as unsafe and unprofessional. It's not what we expect from high-end navies in terms of acting responsibly at sea. I won't try to assume what the intentions were of the PLAN ship in that maneuver. I would only say that I'm proud of the way that the US Navy destroyer captain and his crew handled themselves in that situation, adhering to international law, communicating very clearly on the radio so that not only that particular Chinese ship, but anybody in the vicinity, could understand what we were doing and why. The US military said in June a Chinese naval ship sailed across the path of its naval vessels transiting the Taiwan Strait. Takagi: The military-to-military hotline between the US and China has not been used since the then House of Representatives Speaker Nancy Pelosi visited Taiwan last summer. Do you have any concerns about an unexpected military confrontation right now? Gilday: We have seen an increase in PRC activity in the maritime since Speaker Pelosi's visit last year. I think that it would be better if we could talk on a more regular basis and have open lines available when any type of friction is evident between our nations. We should avoid a position where we're trying to read somebody else's mind. But we will, in the absence of those communications, have to rely on what we see, how forces behave, what they're doing, and then respond accordingly based on the directions and guidance that we receive from our superiors. I think that the most recent visits (to China) of high-ranking US officials; the Secretary of State, the Treasury Secretary, I think that they're a good sign, in terms of communications improving. And we'll see one day if we get to a point where military-to-military communications become more the norm. US Secretary of State Antony Blinken met with Chinese President Xi Jinping on June 19 in Beijing. China's ultimate goal Takagi: Looking at PLA's activities today in East Asia, what do you think China ultimately wants to achieve? Gilday: It would appear by their actions that the PRC has an intent to test and potentially change the rule-based international order to make it advantageous for them. I think that there's a difference in mindset in terms of how our country, how the PRC views international

rules-based order, versus the way that other nations do. I think that we need to continue to uphold the international rules that are globally recognized, and we should challenge any nation that tries to test the validity of those rules. US Navy and global military power balance Takagi: How do you see the balance of military strength between the US and China in the Western Pacific region? Gilday: I think that the US military maintains a **very healthy** deterrent capability in the Western Pacific. As important is what we're doing on a day-to-day basis in conjunction with allies and partners. The US and Japan are both involved in the Quad, as an example. We see our bilateral — the US Navy and the Japanese Maritime Self Defense Force — and multilateral exercises are **ongoing** on almost a monthly basis. I do think that the growth of the Chinese navy has been impressive, and we respect that growth. After two decades of ground wars in Iraq and Afghanistan, the US has begun to **invest heavily** in our maritime forces, along with the US Marine Corps. So right now, in seven shipyards across the country, we have 55 ships that are under construction, and another 70 that are under contract to be built. That's a **significant investment**. I think the capabilities that we field, along with a very highly trained professional force, are really the **asymmetric advantage** that we have over anybody. Takagi: In order to counter the Chinese navy, the largest in the world, how should the US strengthen and develop its capabilities in the coming years? Gilday: If I take a look at the PLAN aircraft carriers against US capabilities, the US has a **far lead** in terms of **capabilities**, in terms of **operational expertise**. We have been operating carriers at sea **for a century now.** We've learned a lot in peace and war, in terms of how to operate them. The nuclear propulsion that we have in those carriers allows us to maintain them at sea for extended periods of time. We are **highly proficient** in terms of our ability to **generate** dozens and dozens and dozens of sorties off the deck of an aircraft carrier, to reload the weapons on an aircraft carrier. We're very adept at that.

Readiness is the top priority and millions of dollars are being invested.

Megan **Eckstein 23.** naval warfare reporter at Defense News. “US Navy pitches short, readiness-focused budget wish list to Congress.” 3/24/23. https://www.militarytimes.com/naval/2023/03/24/us-navy-pitches-short-readiness-focused-budget-wish-list-to-congress/

The U.S. Navy released a short wish list to Congress that would mostly **accelerate efforts** to make the fleet **more ready** and **more lethal** for high-end combat in a contested environment. The 11 items total $2 billion, while past years’ lists included dozens of items and expensive procurement requests. Chief of Naval Operations Adm. Mike Gilday has set readiness **as his top priority**, followed by boosting lethality, and then **not increasing the size** of the fleet **beyond** what it can support in manpower, maintenance, munitions and **other measures of readiness**. In line with those priorities, the top four items on the Navy’s fiscal 2024 unfunded priorities list are research and development efforts to boost lethality. The sea service wants $45 million to develop the **Maritime Targeting Cell-Afloat,** which would fuse information from a range of sensors to shore-based and at-sea nodes in communications-denied environments. This project “[d]irectly supports Project Overmatch and Joint All Domain Command and Control (JADC2) by integrating intelligence, sensors, shooters, platforms, and weapons to enhance lethality and survivability,” according to the Navy. A second research and development effort, for $49 million, **would modernize** the E-2D Advanced Hawkeye aircraft, which serves as the command-and-control “quarterback” in naval aviation operations. This effort to **update** “legacy cockpit, mission computers, displays, and multiple cyber issues” would allow the aircraft, which operate at sea as part of the carrier air wing, to **improve their targeting** and enable long-range maritime strike missions. Third on the list is $186 million to help bring the Zumwalt-class destroyers — the first ships that will host the Conventional Prompt Strike hypersonic missiles — into the Project Overmatch network. The Zumwalt Enterprise Upgrade Solution would add assured beyond-line-of-sight communications to support hypersonic weapons employment. The fourth item, dubbed VIOLET, is classified. The list includes a combined $472 million to accelerate the installation of the Surface Electronic Warfare Improvement Program block III capabilities onto both new Flight III Arleigh Burke-class destroyers — including hulls 136 and 137, which won’t deliver until 2028 or 2029 — and aircraft carriers, including Harry S. Truman during its midlife refueling and complex overhaul as well as Enterprise during its ongoing construction. The two largest items on the list are $550 million for a set of facilities restoration and modernization projects for installations around the globe, and $300 million for dry dock repairs at Puget Sound Naval Shipyard in

Washington. Also boosting readiness is $**100 million to field** more spare parts on ships for surface, cyber and information technology systems onboard ships, as well as **$175 million** for more aviation spares on aircraft carriers.

AT: Missile Defense

Icebreakers are not essential for missile defense.

Paul **Avey 19**. Assistant professor of political science at Virginia Tech. "The Icebreaker Gap Doesn't Mean America is Losing in the Arctic." War on the Rocks. 11-28-2019. https://warontherocks.com/2019/11/the-icebreaker-gap-doesnt-mean-america-is-losing-in-the-arctic/

Icebreakers would play a marginal role in **countering** other **military challenges** to the United States emerging from the region. Missiles fired from the Russian Arctic toward the United States would **traverse** over the **Arctic**. The status of what the DoD terms the "**aging North Warning System**" is a **greater concern** from this perspective than a **lack of icebreakers**. Similarly, while Russia's icebreakers are important for its Northern Fleet's ability to operate in and through the Arctic, the number of U.S. icebreakers has little bearing on this. Addressing Russia's ability to project power into the North Atlantic, the DoD Arctic strategy focuses on other capabilities. These include cooperation with Great Britain and Norway on P-8 patrols, NATO air policing missions from Iceland, and a recognition that establishment of Joint Force Command Norfolk helps to protect the North Atlantic sea lines of communication to Europe.

Missile defense fails.

Joe **Cirincione 25**. President of the Ploughshares Fund, nuclear policy analyst with over 30 years of experience. "The national missile defense fantasy—again." Bulletin of the Atomic Scientists. 2-4-2025. https://thebulletin.org/2025/02/the-national-missile-defense-fantasy-again/

Not an iron dome; more like an iron colander. The major **technical problems** that **remain unresolved**—and eventually forced the cancellation of all SDI's ambitious plans—are the **same obstacles** that have **ruled** out an **effective ballistic missile defense** for more than **60 years**:

the ability of the enemy to overwhelm a system with offensive missiles;

the questionable **survivability** of space-based weapons;

the inability to discriminate among real warheads and hundreds or thousands of **decoys**;

the problem of designing battle management, command, control, and communications that could function in a nuclear war; and,

the **low confidence** in the ability of the system to work perfectly **the first**—and, perhaps, only—**time** it is ever used.

These problems have been detailed at length already in the Bulletin's columns, **congressional reports**, and independent **expert studies**, including two that played a major role in the Star Wars debates—the 1987 American Physical Society Directed Energy Weapon study and the 1988 Office of Technology Assessment Ballistic Missile Defense study.

These and other technical problems would have to be resolved before an effective missile defense system can be deployed. In the long term, new technologies, particularly directed energy weapons, hold some promise. In the short term, however, there is **little reason** for **blind technological optimism**.

Intentionally confusing the US **public** and gullible **politicians** by conflating the limited success of **less-complicated defenses** against short-range rockets with the infeasibility of destroying hundreds of **long-range ballistic missiles** is part of the **sales effort.**

"Israel has an Iron Dome. They have a missile defense system," Trump promised at the Republican Party convention last year. "Why should other countries have this, and we don't?"

Because it is **technically impossible** to **build** a **system** that can protect the United States from **ballistic missile attack**, Mr. President. No amount of hucksterism will change that.

"Iron Dome defends small areas from short-range nonnuclear missiles. It's a vastly easier task than defending the **whole country** against missiles that travel 100 times further and **seven times faster**," missile defense expert Laura Grego of the Union of Concerned Scientists explains.

"There is **zero possibility** of a **comprehensive missile defense** of the United States in the foreseeable future," James N. Miller, who served as undersecretary of defense in the Obama administration, told Max Boot. "We are not going to escape **mutual assured destruction** vis-à-vis **Russia** or **China**."

As shown repeatedly over the past 60 years, the only way to eliminate the threat of nuclear-armed missiles is to negotiate their elimination. Pretending that there is a magic shield that can be willed into existence will only make the problem of national missile defense worse.

AT: Research Advantage

AT: Disease/ Pandemic

Risk of an existential disease threat is incredibly low.

Dr. Ilan **Noy 22**. Chair in the Economics of Disasters and Climate Change at the Victoria University of Wellington, PhD from the University of California, Santa Cruz, and Dr. Tomáš Uher, PhD, Professor at Masaryk University, "Four New Horsemen of an Apocalypse? Solar Flares, Super-volcanoes, Pandemics, and Artificial Intelligence", Economics of Disasters and Climate Change, 1/15/2022, SpringerLink

High-Mortality Pandemics

A naturally occurring pandemic (i.e., not from an engineered pathogen) that would threaten human extinction is a **very small** probability event. However, historical accounts point to several instances where disease spread played an important role in causing very significant decline of specific populations. For example, the introduction of novel diseases to the Native American population during the European colonization of the Americas had deadly consequences. It is difficult to distinguish the effects of the diseases that came with the Europeans from the war and conflict they also brought with them. Nevertheless, during the first hundred years of the colonization period, the American population may have been reduced by as much as 90% (Ord 2020).

Moreover, two major pandemic events, the Justinian Plague in the sixth century and the Black Death in the fourteenth century appear to have been severe enough to cause a significant population decline of tens of percent in the populations they affected. Both events are believed to have been caused by plague, an infectious disease caused by the bacteria Yersinia Pestis (Christakos et al. 2005; Allen 1979). While there is a certain degree of uncertainty involved in studying these events' societal impacts, historical accounts in combination with modern scientific methods provide us with some valuable insights into the effects they may have had on the societies of the time.

With respect to the possibility of a future catastrophic global pandemic, it appears that this risk is increasing significantly along with the advances in the field of synthetic biology and the rising possibility of an accidental or intentional release of an engineered pathogen. While some of the scientific efforts in the field of synthetic biology are directed towards increasing our understanding and our ability to prevent future catastrophic epidemic threats, the risk stemming from these activities is non-trivial, and may outweigh their benefits.

The Justinian Plague

The Justinian Plague severely affected the people of Europe and East Asia, though estimates of its overall mortality vary. Focusing exclusively on the first wave of the pandemic (AD 541–544), Muehlhauser (2017) suggests the pandemic was associated with a 20% mortality in the Byzantine empire. This estimate is based on the mortality rate estimated for the empire's capital, Constantinople, by Stathakopoulos (2007) to produce a death toll of roughly 5.6 million. For a longer time span, AD 541 to 600, which included subsequent waves of the plague, scholars estimate a higher mortality rate of 33–50% (Allen 1979; Meier 2016).

The demographic changes associated with this high mortality led to a significant disruption of economic activity in the Byzantine empire (Gârdan 2020). A decline in the labour force caused a decline in agricultural production which led to food shortages and famine (Meier 2016). Trade also collapsed. Decreased tax revenues caused by the population decline initiated a major fiscal contraction and consequently a military crisis for the empire (Sarris 2002; Meier 2016). In the longer run, however, the massive reduction of the labour force appears to have had a positive economic effect for the surviving laborers, as the increased marginal value of labour caused a rise in real wages and per capita incomes. These beneficial effects for the survivors were also observed after the Black Death (Pamuk and Shatzmiller 2014; Findlay and Lundahl 2017).

The mortality and the disruption of activity the plague caused in the Byzantine empire also led to further direct and indirect cultural and religious consequences. Meier (2016) particularly highlights the plague's indirect effect of an increase in liturgification (a process of religious permeation and internalization throughout society as defined by Meier 2020), the rise of the Marian cult, and the sacralization of the emperor.

The direct and indirect effects of the plague also appear to have had far-reaching and long-term political repercussions. The societal disruptions caused by the plague are believed to have significantly weakened the position of the Byzantine empire and arguably led to the decline of the Sasanian empire (Sabbatani et al. 2012). Interestingly, the pandemic indirectly favoured the nomadic Arab tribes who were less vulnerable to the contagion while traveling through desert and semi-desert environments during the initial expansion of Islam (Sabbatani et al. 2012).

Of note is the absence of a scientific consensus on the severity of the Justinian Plague's impacts. For example, Mordechai and Eisenberg (2019) and Mordechai et al. (2019) argue against the maximalist interpretation of the historical evidence described above. They suggest that the estimated mortality rate of the plague is exaggerated, and that the pandemic was not a primary cause of the transformational demographic, political and economic changes in the Mediterranean region between the sixth and eighth century. Recently, White and Mordechai (2020) highlighted the high likelihood of the plague having different impacts in the urban areas of the Mediterranean outside of Constantinople.

The Black Death

The Black Death which ravaged Europe, North Africa, and parts of Asia in the middle of the fourteenth century is considered the deadliest pandemic in human history and potentially the most severe global catastrophe to have ever struck mankind. With respect to its mortality, Ord (2020) argues that the best estimate of its global mortality rate is 5–14% of the global population, largely based on Muehlhauser (2017).

The plague created a large demographic shock in the affected regions. It reduced the European population by approximately 30–50% during the 6 years of its initial outbreak (Ord 2020). It took approximately two centuries for the population levels to recover (Livi-Bacci 2017; Jedwab et al. 2019b). As the mortality rates appear to have been the highest among the working-age population, the effects on the labour force were acute (Pamuk 2007).

The plague's mortality, morbidity and the associated societal disruption led to a major decline in economic output both in Europe (Pamuk 2007) and the Middle East (Dols 2019). In Europe, however, this decline in economic output was smaller than the decline in population; output per capita began to increase within a few years of the initial outbreak (Pamuk 2007).

The large demographic shock caused by the plague led to a shift in the relative price of labour which, similarly to the Justinian Plague, had a positive impact on wages. With a reduced labour force, real wages and per capita incomes in many European countries increased and were sustained at higher levels for several centuries (Voigtländer and Voth 2013a; Jedwab et al. 2020; Pamuk and Shatzmiller 2014). Scott and Duncan (2001) point out that real wages approximately doubled in most countries of Europe in the century following the plague.

An additional insight into the long-run relationship between the Black Death's mortality and per capita incomes in Europe is offered by Voigtländer and Voth (2013a). Using a Malthusian model, they suggest that over time, the rise in income caused by the plague's mortality led to an increase in urbanization and trade. Furthermore, the increased tax burden (per capita), combined with the contemporary political climate, increased the frequency of wars. Consequently, higher urbanization and trade led to an increase in disease spread which along with a more frequent war occurrence caused a long-term increase in mortality and a further positive effect on per capita incomes. In this way, the Black Death appears to have created a long-lasting environment of high-mortality and high-income specifically in Western Europe, functioning as an important contributing factor to its economic growth in the next centuries (Alfani 2020). However, while in Western Europe incomes remained elevated over the next centuries, in Southern Europe they began to decline as the Southern European population started recovering after AD 1500 (Jedwab et al. 2020).

Apart from the positive effects on wages, the increased marginal value of labour combined with other factors had further economic and social implications. A decreased relative value of land and the lack of workforce to use it effectively caused land prices and land rents to decrease (Jedwab et al. 2020; Pamuk 2007). A decreased marginal value of capital assets in general led to a lapse in the enforcement of property rights (Haddock and Kiesling 2002). Interest rates and real rates of return on assets also decreased (Pamuk 2007; Jedwab et al. 2020; Pamuk and Shatzmiller 2014; Jordà et al. 2021; Clark 2016).

Higher wages in combination with a relative abundance of land increased people's access to land/home ownership, likely reducing social inequality (Alfani 2020). On the other end of the income distribution, decreased incomes for landowners led to an overall decrease in income inequality (Jedwab et al. 2020; Alfani and Murphy 2017).

With respect to the effects on agriculture, the structure of agricultural output moved away from cereals to other crops following the plague. Furthermore, the workforce shortages and the incentives to increase the labour supply are believed to have caused a shift from male-labour intensive arable farming towards pastoral farming, consequently raising the demand for female labour (Voigtländer and Voth 2013b). However, while the Black Death appears to have caused certain structural agricultural changes, Clark (2016) finds no effect of the plague on agricultural productivity in the long run.

In terms of other social consequences, the evidence suggests that the plague's mortality reduced labour coercion, particularly throughout Western Europe (Jedwab et al. 2020; Haddock and Kiesling 2002; Gingerich and Vogler 2021). The increased bargaining power of labour caused by the plague's demographic shock contributed to and accelerated the decline in serfdom and development of a free labour regime. Gingerich and Voler (2021) further argue that these effects may have had long-lasting political implications and that a decline of repressive labour practices (such as serfdom) permitted the development of more inclusive political institutions. They find that the regions with the highest mortality were more likely to develop participatory political institutions and more equitable land ownership systems. They find that centuries later, In Germany, the populations in these high-mortality regions were less likely to vote for Hitler's National Socialist (Nazi) Party in the 1930 and 1932 elections in Germany.

However, the positive effects on the emergence of freer labour did not take place in Eastern Europe, where serfdom was sustained and even intensified. Robinson and Torvik (2011) attempt to explain this asymmetry arguing that these differential outcomes may have been caused by the varying power and quality of institutions. The authors suggest that opportunities generated by the increased bargaining power of labour, in an environment of weak institutions, were less likely to lead to a positive effect than in the case of regions with stronger institutions (with more robust rule-of-law or less corrupt or predatory practices).

Apart from causing a negative demographic shock to the affected populations, the Black Death appears to have caused further indirect demographic changes, particularly in Western Europe. The increased employment opportunities for females caused by worker shortages and a higher female labour demand led to a decline in fertility rates and an increased age of marriage (Voigtländer and Voth 2013b). This demographic transition to a population characterized by lower birth rates likely helped to preserve the high levels of per capita incomes and contributed to further economic development of certain parts of Europe, enabling it to escape the "Malthusian trap" in the following centuries (Pamuk 2007). Siuda and Sunde (2021) confirm the pandemic's effect on the accelerated demographic transition empirically, as they find that greater pandemic mortality was associated with an earlier onset of the demographic transition across the various regions of Germany.

Unfortunately, the Black Death also led to an increase in the persecution of Jews (Finley and Koyama 2018; Jedwab et al. 2019a). Interestingly, Jedwab et al. (2019a) were able to estimate that in the case of regions with the highest mortality rates, the probability of persecution decreased if the Jewish minority was believed to benefit the local economy.

It is important to highlight that the long-term repercussions of the Black Death were highly asymmetrical. While in Western Europe the pandemic appears to have led to some long-term dynamic shifts associated with increased wages, decreased inequality and a decrease in labour coercion, this was not the case for other regions. A decrease in wages was observed for example in Spain (Alfani 2020) and Egypt. In Spain, the plague's demographic impact on an already scarce population caused a long-lasting negative disruption to the local trade-oriented economy. The workforce disruption in Egypt led to a collapse of the labour-intensive irrigation system for growing crops in the Nile valley, with consequent disastrous effects on the rural economy (Alfani 2020). Borsch (2005) argues that the economic decline in Egypt caused by the Black Death "put an end to the power in the heartland of the Arab world" (p. 114) and to the impressive scientific and technological developments that came out of this region.

A consensus for an explanation of the Black Death's varied impacts across regions, and their determinants, does not appear to exist. However, several researchers attempt to provide partial insights. For example, Alfani (2020) considers the differential outcomes to be broadly dependent upon the initial conditions in each region. More specifically, both Robinson and Torvik (2011) and Pamuk (2007) propose that the asymmetry of impacts can largely be explained by the differences in the institutional environments of the affected societies.

It is argued that the Black Death defined the threshold between the medieval and the modern ages, similarly to the way the Justinian Plague did for antiquity and the Middle Ages (Horden 2021). Furthermore, the differential long-term outcomes of the Black Death likely provided a significant contribution to the so-called "Great Divergence" between Europe and the rest of the world and the "Little Divergence" between North-western and Southern and Eastern Europe (Jedwab et al. 2020; Pamuk 2007).

From this perspective, it would seem rational to conclude that apart from causing substantial and long-term demographic, economic, political, and cultural changes, both the Justinian Plague and the Black Death likely significantly altered the course of human history.

Considering the above, it is not unreasonable to expect that a pandemic of a similar magnitude to these past catastrophes would do the same in the present day. However, what societal impacts a pandemic of similar or higher mortality would inflict in the twenty-first century has not really been the subject of any study, as far as we were able to identify. A possibility exists, given the newly developed capacity of humanity to create new pathogens, that the outcomes of a future catastrophic pandemic will be even more adverse than those of the Justinian Plague and the Black Death.

Probability

In terms of the probability of naturally occurring pandemics, **a**n informal survey of participants of the **G**lobal **C**atastrophic **R**isk Conference in Oxford in 2008 shows that the median estimate for a probability of a natural pandemic killing more than 1 billion people before the year 2100 was surveyed to be **5%**, and the probability of such pandemic to cause human extinction was **0.05%**. Ord (2020) uses a slightly broader definition of existential risk, which apart from human extinction also includes a permanent reduction of human potential. He estimates the **probability** of an **existential** risk stemming from a natural pandemic in the **next 100 years** to be **0.01%**.

Turn. The plan's development of the Arctic makes disease spread more likely.

Robin **Mckie 24**. Science Editor. "Arctic zombie viruses in Siberia could spark terrifying new pandemic, scientists warn." Guardian. 1-21-2024. https://www.theguardian.com/society/2024/jan/21/arctic-zombie-viruses-in-siberia-could-spark-terrifying-new-pandemic-scientists-warn

However, it is not melting permafrost directly that **poses** the **most immediate risk**, added Claverie. "The danger comes from another global warming impact: the **disappearance** of **Arctic sea ice**. That is allowing increases in **shipping**, **traffic** and **industrial development** in Siberia. Huge **mining operations** are being planned, and are going to **drive** vast **holes** into the **deep permafrost** to **extract oil and ores**.

"Those operations will **release vast amounts** of **pathogens** that still thrive there. Miners will walk in and breath the viruses. The effects could be **calamitous**."

This point was stressed by Koopmans. "If you look at the history of epidemic outbreaks, one of the **key drivers** has been **change in land use**. Nipah virus was spread by fruit bats who were driven from their habitats by humans. Similarly, monkeypox has been linked to the spread of urbanisation in Africa. And that is what we are about to **witness** in the **Arctic**: a **complete change in land use**, and that could be dangerous, as we have seen **elsewhere**."

Scientists believe that **permafrost** – at its deepest levels – may contain viruses that are up to a **million years old** and so will be far older than our own species, which is thought to have emerged about 300,000 years ago.

"Our immune systems may have never **been** in **contact** with **some of those microbes**, and that is another worry," said Claverie. "The scenario of an unknown virus once infecting a Neanderthal coming back at us, although unlikely, has become a real possibility."

Worst-case pandemics are impossible. Humans can adapt.

Amesh **Adalja 21**. Senior scholar at the Johns Hopkins Center for Health Security and an infectious disease critical care and emergency medicine physician, 4/19/21. "WHAT WOULD HAPPEN IF A PANDEMIC KILLED 10 PERCENT OF HUMANS?" https://www.inverse.com/science/pandemic-wipes-out-10-percent-of-population-future-earth-2121

Covid-19 has shown us just how serious the threat of an emerging infectious disease can be — and just how underprepared we are to handle another like it. Amesh Adalja, a senior scholar at the Johns Hopkins Center for Health Security and an infectious disease critical care and emergency medicine physician, tells Inverse that **it's unlikely future pandemics will ever reach the toll on human life caused by something like the Black Death**. Still, a disease with even a fraction of plague's mortality would be a global concern.

Inverse spoke to Adalja about how a deadly pandemic could transform the Earth by 2121. His response has been edited and condensed:

Many people think about pandemics as extinction events for the human species, but it's **highly unlikely** you find a pandemic able to do something on that level. Our mitigation efforts, as well as idiosyncrasies in the human immune response, are likely to leave some segment of the population **able to withstand the infection**. It's much more valuable to think about infectious diseases that have mortality rates of around 20 percent.

Disease doesn't cause extinction.

John **Halstead 19**. Doctorate in political philosophy. "Cause Area Report: Existential Risk." Founders Pledge. 2019. https://founderspledge.com/research/Cause%20Area%20Report%20-%20Existential%20Risk.pdf

However, there are some reasons to think that naturally occurring pathogens are **unlikely** to cause human extinction. Firstly, Homo sapiens have been around for **200,000 years** and the Homo genus for around six million years without being exterminated by an infectious disease, which is evidence that **the base rate of extinction-risk natural pathogens is low**.82 Indeed, past disease outbreaks have not **come close** to rendering humans extinct. Although bodies were piled high in the streets across Europe during the Black Death,83 human extinction was never a serious possibility, and some economists even argue that it was a boon for the European economy.84 Secondly, infectious disease has only contributed to the extinction of a **small minority of animal species**.85 The only confirmed case of a mammalian species extinction being

caused by an infectious disease **is a type of rat** native **only to Christmas Island**. Having said that, the context may be importantly different for modern day humans, so it is unclear whether the risk is increasing or decreasing. On the one hand, due to globalisation, the world is more interconnected making it easier for pathogens to spread. On the other hand, interconnectedness could also **increase immunity** by **increasing exposure** to **lower virulence strains between subpopulations**.87 Moreover, advancements in **medicine** and **sanitation** limit the potential damage an outbreak might do.

No impact to permafrost diseases.

Rachel **Mackelprang et al. 25**. Professor at California State University Northridge, Northridge, California, USA. With Robyn A. Barbato, Andrew M. Ramey, Ursel M. E. Schütte, and Mark P. Waldrop. "Cooling perspectives on the risk of pathogenic viruses from thawing permafrost." Environmental Microbiology, Minireview, 8 January 2025. https://journals.asm.org/doi/10.1128/msystems.00042-24

CONCLUSIONS

Currently available data indicate that there is **no increased risk** of **human viral pathogen** emergence from **permafrost compared** to **other environmental sources**. We do not claim that viral pathogens in permafrost pose zero risk or that surveillance of putative viral pathogens in permafrost is unnecessary. However, there is currently **no evidence** that **human** or animal viral **pathogens frozen in permafrost pose** an **imminent disease outbreak threat**. Though climate change is accelerating thaw, the **entry** of microbes from **ancient permafrost** into the modern environment is not a **new phenomenon**. Permafrost is continually and naturally exposed to the modern environment by **processes** such as **erosion**, cryoturbation, frost heave, solifluction, wildfire, and **climate fluctuations** (151–153). Humans have been in the Arctic for more than 40,000 years (Alaska up to 25,000 years and Scandinavia ~5,000 to 12,000 years) (154–156). This suggests that people are and have been **regularly exposed** to **viruses** from **permafrost soils**, with no clear evidence for large-scale health consequences.

Framing viral discovery efforts in the cryosphere as a search for "zombie viruses" or potentially pandemic pathogens is not particularly useful and **perhaps even harmful.** Stoking fears of viruses in thawing permafrost may inadvertently discourage customary and traditional cultural practices among subarctic and Arctic residents or divert attention from the more pressing ways that pathogens in the warming Arctic pose risk to human health and well-being (157). For example, wildlife and humans increasingly occupy shared habitats, providing opportunities for viruses maintained in animals to spillover into humans (90). Arthropod and rodent disease vector ranges are expanding and shifting northward (158). Extreme precipitation and flooding events are increasing, threatening infrastructure such as water and waste treatment facilities (159–161). Higher temperatures increase the survival of some water-borne disease agents (91). Furthermore, wildlife health may be affected as a consequence of climate change, which further compromises fragile ecosystems and the people that rely upon them (162).

Permafrost diseases aren't dangerous.

Paul **Hunter 22**. Professor of Medicine, University of East Anglia. "Pandoravirus: the melting Arctic is releasing ancient germs – how worried should we be?." The Conversation. 12-14-2022. https://www.gavi.org/vaccineswork/pandoravirus-melting-arctic-releasing-ancient-germs-how-worried-should-we-be

Scientists have recently revived several large viruses that had been buried in the frozen Siberian ground (permafrost) for **tens of thousands of years**.

The youngest virus to be revived was a sprightly 27,000 years old. And the oldest – a Pandoravirus – was around 48,500 years old. This is the oldest virus ever to have been revived.

As the world continues to warm, the thawing permafrost is releasing organic matter that has been frozen for millennia, including bacteria and viruses – some that can still reproduce.

This latest work was by a group of scientists from France, Germany and Russia; they managed to reanimate 13 viruses – with such exotic names as Pandoravirus and Pacmanvirus – drawn from seven samples of Siberian permafrost.

Assuming that the samples were not contaminated during extraction (always difficult to guarantee) these would indeed represent viable viruses that had previously only replicated tens of thousands of years ago.

This is not the first time that a viable virus has been detected in permafrost samples. Earlier studies have reported the detection of a Pithovirus and a Mollivirus.

In their preprint (a study that is yet to be reviewed by other scientists), the authors state that it is “legitimate to ponder the risk of ancient viral particles remaining infectious and getting back into circulation by the thawing of ancient permafrost layers”. So what do we know so far about the risk of these so-called “zombie viruses”?

All the viruses cultured so far from such samples are giant DNA viruses that only affect amoebae. They are far from **viruses** that affect **mammals**, let alone, humans and would be **very unlikely** to **pose a danger to humans**.

However, one such large amoebae-infecting virus, called Acanthamoeba polyphaga mimivirus, has been linked to pneumonia in humans. But this association is still far from proven. So it **does not appear** that the **viruses cultured** from **permafrost** samples pose a **threat to public health**.

A more relevant area of concern is that as the permafrost thaws it could release the bodies of long-dead people who might have died of an infectious disease and so release that infection back into the world.

The only human infection that has been eradicated globally is smallpox and the reintroduction of smallpox, especially in hard-to-reach locations, could be a global disaster. Evidence of smallpox infection has been detected in bodies from permafrost burials but “only partial gene sequences” so broken bits of virus that could not infect anyone. The smallpox virus does, however, survive well **when frozen at -20°C**, but still only for a **few decades** and **not centuries**.

In the last couple of decades, scientists have exhumed the bodies of people who died from the Spanish flu and were buried in permafrost-affected ground in Alaska and Svalbard, Norway. The influenza virus was able to be sequenced but not cultured from the tissues of these deceased people. Influenza **viruses** can survive frozen for at least a year when frozen but **probably not several decades**.

AT: Biodiversity

Conservation of Arctic biodiversity is strong now.

WWF Arctic 24 "Arctic conservation wins 2024." World Wildlife Fund. 12-16-2024. https://www.arcticwwf.org/newsroom/features/arctic-conservation-wins-2024/

This past year was the second-warmest year on record, according to NOAA’s 2024 Arctic Report Card. Despite this challenge, **progress** has been made in **protecting** this **unique region**. From tackling **black carbon emissions** to mapping **whale migration routes** across the **Arctic Ocean**, advancing marine protections, and supporting Indigenous-led conservation, these achievements demonstrate the power of collaboration, science, and **leadership** in **Arctic conservation**.

Driving conservation through collaborative partnerships

Collaborative efforts are driving impactful marine conservation across the Arctic. In Alaska, WWF-US is partnering with the Inuit communities of Kotlik and Emmonak to better understand beluga whales in the Yukon River. Through acoustic monitoring, this initiative combines Indigenous knowledge and science to study how belugas are adapting to a changing ecosystem, ensuring their protection.

In Greenland, WWF is supporting sustainable tourism development by helping tour operators learn from Iceland's experiences. This initiative focuses on expanding tourism in the region while protecting the pristine environment that makes East Greenland unique. By promoting best practices, the project aims to balance economic opportunities with environmental conservation.

In Nunavut, Canada, WWF-Canada is working closely with Inuit leaders to support community-led conservation projects. These efforts focus on conserving natural areas and species while simultaneously protecting livelihoods and enhancing food security. By aligning conservation with community priorities, the initiative strengthens both ecological and human well-being.

These projects showcase the power of partnerships that blend Indigenous leadership, local knowledge, and scientific expertise.

In 2024, WWF celebrated a significant milestone for Arctic marine conservation with the publication of a scientific paper detailing ArcNet, a groundbreaking framework for protecting Arctic ecosystems. Originally introduced in 2021, ArcNet identifies 83 priority areas for conservation across the Arctic Ocean laying the foundation for a comprehensive network of marine protected and conserved areas. This publication advances global understanding of the Arctic's biodiversity and provides a clear path for conservation action.

The paper showcases ArcNet's methodology, which identifies critical habitats, such as breeding grounds and feeding areas for Arctic marine life. By sharing these findings, WWF has equipped policymakers and stakeholders with a blueprint and the tools needed to meet global conservation targets, including protecting 30 per cent of the world's oceans by 2030.

Protecting the **Central Arctic Ocean** from **overfishing**

In 2024, a key step was taken to ensure the future protection of the Central Arctic Ocean through the continued implementation of the Central Arctic Ocean Fisheries Agreement (CAOFA). This landmark agreement prevents unregulated commercial fishing in this sensitive and rapidly changing region. During a meeting held in June 2024, WWF emphasized two critical points:

The need to identify and protect sensitive areas where even exploratory fishing would be harmful.

The importance of delaying adoption of regulations unless they meet the highest standards of precaution.

The outcome of this meeting reflects this cautious approach, with parties agreeing to take additional time to refine the rules. This delay provides an opportunity to ensure the regulations are truly robust and to strengthen the agreement by carving out areas where fishing will be prohibited. WWF remains actively engaged, offering concrete proposals to make CAOFA a model for precautionary governance in the Arctic Ocean.

Safeguarding Arctic whales

In September of 2024, we produced a significant and essential building block for whale conservation with the release of WWF's Arctic Blue Corridors online report. This interactive resource highlights the critical migratory routes of narwhals, bowhead whales, and belugas—routes that are vital for their survival. The report also reveals a concerning overlap between these blue corridors and increasing ship traffic in the Arctic, which has surged by 37 per cent from 2013 to 2023. This growing presence of vessels brings threats, such as fatal collisions and underwater noise pollution, disrupting the whales' ability to navigate, feed, and avoid predators.

The report underscores the urgent need for Arctic countries to incorporate blue corridors into their biodiversity commitments, including protecting 30 per cent of oceans by 2030. It also calls on the shipping industry to adapt by rerouting ships away from critical whale habitats or slowing down in unavoidable migration bottlenecks. These measures, combined with innovative solutions like quieter ship technologies, offer a clear path forward. Now is the time to act.

Tackling black carbon in the Arctic

The ban on heavy fuel oil (HFO) in the Arctic, which came into effect on 1 July 2024, marks a significant milestone in **protecting** this **fragile ecosystem**. HFO is not only a highly polluting fuel but also a major source of black carbon, a short-lived yet potent climate pollutant produced by the incomplete combustion of fossil fuels. When black carbon settles on Arctic snow and ice, it accelerates melting by reducing reflectivity, contributing to the region's warming at alarming rates. However, the ban includes significant loopholes which delay full implementation until 2029, meaning the risk to Arctic biodiversity remains significant.

In October 2024, the International Maritime Organization (IMO) took an important step by agreeing to advance discussions on regulating black carbon emissions. During the Marine Environment Protection Committee meeting (MEPC 82), the IMO committed to exploring the concept of 'polar fuels', which could dramatically reduce black carbon emissions by requiring ships to transition from dirty HFO to cleaner alternatives, such as distillate fuels or low-carbon options.

This progress follows over a decade of inaction, despite clear evidence of black carbon's devastating impact on Arctic ice and global climate systems. Member States now have until January 2025 to refine proposals for mandatory regulations, which could be adopted by 2026. While this is a positive development, swift action is essential to secure lasting protection for the Arctic and mitigate global climate change.

Pausing deep-sea mining in Norway

In 2024, Norway's plans for deep-sea mining faced significant pushback, resulting in a critical pause to reconsider environmental protections. Deep-sea mining threatens fragile marine ecosystems, many of which remain unexplored. Despite global calls for caution, Norway aimed to authorize mining without sufficient environmental impact assessments, raising concerns about compliance with national and international laws, including the newly adopted High Seas Treaty designed to protect marine biodiversity.

WWF Norway and other civil society groups stepped in, filing a lawsuit against the Norwegian government for failing to apply the precautionary principle and thoroughly evaluate the environmental risks. The legal challenge, combined with public opposition, sparked widespread debate and scrutiny of the government's approach. The turning point came when the Socialist Left Party intervened in Parliament, demanding a halt to the mining plans. This led to a pause in the authorization process, marking a major victory for ocean conservation.

Looking ahead: A shared responsibility

As the Arctic faces ever-increasing challenges, the need for bold, unified action has never been greater. These **conservation successes** show what is possible when countries, communities, and **organizations come together**. By continuing to prioritize **collaboration**, innovation, and Indigenous leadership, we can create a future where the Arctic thrives as a **biodiverse**, well-managed, and **resilient ecosystem**—safeguarding wildlife, supporting local communities, and contributing to a healthier planet for us all.

Biodiversity loss is not existential.

Dr. John **Halstead 19**. PhD, University of Oxford, researcher at Founders Pledge; citing Dr. Peter Kareiva, PhD in ecology and evolutionary biology, Cornell University, director of UCLA's Institute of the Environment & Sustainability; also citing Valerie Carranza, PhD student in Kareiva's lab, 5/1/2019, "Centre for the Study of Existential Risk Six Month Report: November 2018 - April 2019," https://forum.effectivealtruism.org/posts/zbZxisJRJBCdtYvh9/centre-for-the-study-of-existential-risk-six-month-report

Can you explain what the mechanism is whereby **biodiversity loss** creates existential risk? And if biodiversity loss is an existential risk, how big a risk is it? Should 80k be getting people to go into conservation science or not?

There are independent reasons to think that the risk is negligible. Firstly, according to wikipedia, during the Eocene period ~65m years ago, there were **thousands fewer genera** than today. We have made **~1%** of species extinct, and we would have to continue at **current rates of species extinctions** for **at least 200 years** to return to **Eocene levels of biodiversity**. And yet, even though significantly warmer than today, the Eocene marked the dawn of thousands of new species. So, **why** would we expect the world 200 years hence to be **inhospitable to humans** if it **wasn't inhospitable** for all of the species emerging in **the Eocene**, who are/were **significantly less numerous** than humans and **significantly less capable** of a **rational response to problems?**

Secondly, as far as I am aware, evidence for pressure-induced non-linear ecosystem shifts is **very limited**. This is true for a range of ecosystems. Linear ecosystem damage seems to be the norm. If so, this leaves **more scope** for learning **about the costs** of our damage to ecosystems and correcting any **damage we have done**.

Thirdly, ecosystem services are overwhelmingly a function of the relations within **local** ecosystems, rather than of **global** trends in biodiversity. Upon discovering Hawaii, the Polynesians eliminated so many species that global decadal extinction rates would have been exceptional. This has next to no bearing on ecosystem services outside Hawaii. Humanity is an intelligent species and will be able to see if other regions are suffering from biodiversity loss and **make adjustments accordingly**. Why would all regions be so stupid as to ignore lessons from elsewhere?

Also, is biodiversity actually decreasing in the rich world? I know forest cover is increasing in many places. Population is set to decline in many rich countries in the near future, and environmental impact per person is declining on many metrics.

Biodiversity is overhyped---empirics prove intervening actors and new species check.

Dr. Hannah **Ritchie 24**, Data Scientist, Senior Research at the University of Oxford, Deputy Editor and Lead Researcher of Our World in Data, Ph.D. in Geoscience from the University of Edinburgh, B.A. in Environmental Geoscience, M.A. in Carbon Management, 1/9/2024, "Biodiversity: Protecting the World's Wildlife," *Not the End of the World: How We Can Be the First Generation to Build a Sustainable Planet*, ISBN: 9780316536950

Are we heading for a **Sixth Mass Extinction**?

Watching the **populations** of our most cherished animals **dwindle** is **painful**. Year by year we find fewer nests in the trees, fewer footprints in the soil and smaller herds in satellite images. As tragic as a population decline is, it's a realm away from the complete loss of a species. When we are watching a species in decline – when we have a downward sloping chart – we can cling to the hope that we will reach the trough and **numbers** will **climb** again. Indeed, this has happened **many times**. The **African** elephant, the **Asian** elephant and the **blue whale** were all on **course** for a **wipeout**. But we **pulled** on the **handbrake** just in time, and **populations** have started to **recover**.

Over the **last decade** the number of African **elephants** in Namibia has doubled.27, 28 In Burkina Faso they've increased by 50%. In Zambia, South Africa, Angola, Ethiopia, Malawi and several other countries, populations are on the **up**. After enduring a steep decline there were just 15,000 Asian elephants left in India by 1980. Their numbers have now risen to almost 30,000.

Whether a trend is sloping up or sloping down, there is no reason to believe that it has to continue that way. We nearly **always** have the **opportunity** to **turn** things **around**. But when that line hits zero – as it does in an extinction event – our hopes of a turnaround vanish. It's done. It's finished. That loss hits differently. Yet it's one that the planet has experienced many times over.

Ninety-nine per cent of the 4 billion **species** that have ever **lived** on Earth are now **gone**.29 Extinctions have been a **natural** part of the planet's evolutionary history. 30 Without them, we wouldn't be here today. Species go **extinct**, and **new species** arise. This is **evolution**-in-action.

Current conservation solves---critical species are rapidly rebounding.

Dr. Hannah **Ritchie 24**, Data Scientist, Senior Research at the University of Oxford, Deputy Editor and Lead Researcher of Our World in Data, Ph.D. in Geoscience from the University of Edinburgh, B.A. in Environmental Geoscience, M.A. in Carbon Management, 1/9/2024, "Biodiversity: Protecting the World's Wildlife," *Not the End of the World: How We Can Be the First Generation to Build a Sustainable Planet*, ISBN: 9780316536950

Wildlife is making a **comeback** across some regions.

The European bison is the continent's largest herbivore. Archaeological evidence suggests that the bison was widespread and abundant, stretching from France to Ukraine, down to the tip of the Black Sea.37 The earliest fossils date back to the Early Holocene period – around 9,000 BC.

Bison populations steadily declined over millennia but experienced the most dramatic fall over the last 500 years. Deforestation and hunting of this iconic mammal **nearly drove** it to **extinction**. They had gone extinct in Hungary by the 16th century, in Ukraine by the 18th, and by the early 20th century they had gone completely extinct in the wild, with only tens of individuals kept in captivity. The bison was on the **brink of extinction**. But it has made an

impressive comeback in the last 50 years. By the end of 2021, there were almost 10,000 of them. **Across** the **world**, we find examples of successful **conservation programmes** that have restored animal populations. A coalition of conservation organisations – including the Zoological Society of London, BirdLife International and Rewilding Europe – **periodically** publish reports on how **animal populations** in Europe are changing. In their latest report they looked at the change in populations of 24 mammal species and one reptile species – the loggerhead turtle – that have been making a comeback.38

Eurasian **badger** populations achieved an average increase of 100% – a doubling. Eurasian **otters** tripled, on average. Red **deer** increased by 331%. The Eurasian **beaver** has made the most remarkable **recovery**. It's estimated to have increased 167-fold, on average. There were likely only a few thousand beavers left in Europe in the first half of the 20th century. Today there are more than 1.2 million.

How has Europe achieved all this? In short, it has **stopped** many of the **activities** that were killing **mammals** off in the first place. Agricultural land use has declined across Europe over the last 50 years. This has allowed natural habitats to return. Another essential **development** has been countries **bringing** in **effective protection policies** such as complete **bans** on hunting or **hunting quotas**, designated areas with **legal protections**, **patrols** to catch poachers, and **compensation schemes** for the reproduction of certain species. Finally, some animals – such as the European bison and beaver – made their comeback through breeding and reintroduction programmes.

[FIGURE OMITTED]

Europe is no outlier. The **American bison** has become a **national icon** of the US. Before the Europeans colonised the American continent there were more than 30 million bison. The 19th was a **rapid** and **vicious** century of **extermination**. By the 1880s, there were just a few hundred bison left. Protected parks managed to keep the last remaining individuals safe from hunting, and better laws against hunting mean they have made a comeback over the last century. Today there are around half a million bison across North America, a **1,000-fold** increase from their **lowest point**.

Many of the success stories come from rich countries. But we shouldn't fall into the trap of assuming that a country has to be rich to protect its wildlife. There are success stories from countries across the income distribution.

By the 1960s there were only around 40 Indian rhinos left in the world. They had gone extinct in **Pakistan**, and the remaining few were spread across **India** and **Nepal**. Since then, their numbers have increased 100-fold. There are now almost 4,000 of them. **Sub-Saharan Africa** is home to one of the world's **greatest conservation** success stories. Southern white rhinos were once plentiful across the continent. But intense poaching by the Europeans and killings in the conversion of land for agriculture meant that by the late 19th century this beautiful animal was close to extinction. By 1900, there were only 20 left. All were in the Hluhluwe–iMfolozi Park in South Africa – now a nature reserve. Over the course of the 20th century, extreme protection of these species – particularly in African nature reserves – led to a significant and rapid increase in populations to more than 21,000. There are now 1,000 times as many southern white rhinos as there were a century ago.

The idea that **animals** across the world are going **extinct** and we are powerless to change it is just **not true**.

Conservation is comparatively best at protecting Arctic biodiversity.

Mary **Turnipseed 24**. "Perspective: What does it take to support conservation in a place changing as fast as the Arctic?." George and Betty Moore Foundation.. 4-24-2024. https://www.moore.org/article-detail?newsUrlName=perspective-what-does-it-mean-to-support-conservation-in-a-place-changing-as-fast-as-the-arctic

Climate change demands that we work at a larger scale than before. The rate at which the Arctic is changing makes it a tenuous assumption that we can protect functioning ocean ecosystems just by reducing localized threats with individual protected areas. Because of climate change, many populations will move, and ecosystems will be reorganized. **Local conservation efforts** (i.e., protecting one area) will make the most difference when there are **many**

other protected areas in a network spanning a seascape. This is because of "rescue effects," where, for example, the ability of animals to move between protected areas that safeguard their most important habitats supports the stability of their population.2

Removing other **man-made threats** to **Arctic seas** also **will support** ecosystem **resilience** to **climate change**. As the Arctic warms, a network of **protected areas** spanning a seascape in which fishing, shipping, and offshore development impacts are **mitigated** **will be the best way** to **safeguard** the **Arctic's valuable marine habitats** for current resident and **migratory species,** as well as for the more temperate species whose ranges are shifting northward, like salmon.

Other Countries Solve

European Arctic research is sufficient to solve their impacts.

Helen **Massy-Beresford 25**. "Braving the cold: Europe's polar research strides forward with new polar hub." Horizon Magazine. 1-2-2025. https://projects.research-and-innovation.ec.europa.eu/en/horizon-magazine/braving-cold-europes-polar-research-strides-forward-new-polar-hub

German scientist Dr Nicole Biebow is keenly aware of how important it is to research and protect the Earth's increasingly fragile polar regions.

The two poles are warming faster than any other area on the planet and are losing ice through increased melting. The Arctic, for example, is warming three times as fast as the global average, according to polar scientists. This affects local communities and wildlife, but also has broad socio-economic and climate impacts that extend across the globe, like rising sea levels.

"We always say that the poles are the canary in the coal mine," said Biebow, the project coordinator of an EU-funded project named EU-PolarNet 2, which concluded in December 2024.

Biebow is the head of the international cooperation unit at the Alfred Wegener Institute in Germany and also a former chair of the **European Polar Board** (**EPB**). The EPB is an independent group of **research institutes**, funding agencies and ministries set up to advance the coordination of **European polar research** both in the **Arctic** and **Antarctic**.

The EPB and another key polar research body, the European Polar Coordination Office (EPCO), will be operating out of Sweden's **far north from 2025**. This reflects Europe's determination to be the **leading voice** in **studying** these high**-latitude regions.**

EU-PolarNet 2 carried out much of the work to establish the EPCO, which will start work in January 2025, hosted by the Arctic Centre at Umeå University, Sweden.

A sense of urgency

As global temperatures increase and the polar ice melts ever faster, unlocking the secrets of the polar regions is becoming increasingly urgent.

"A lot of work being done nowadays is about understanding, mitigating or adapting to future changes," Biebow said, noting that "we have EU Member States that have an Arctic coastline and people living in these areas".

As the EU-PolarNet 2 team prepares to launch **EPCO**, the researchers have put together a list of priorities for **future research**, including projects on **sea ice**, melting **glaciers** and **thawing permafrost**.

Biebow voiced hope that **EPCO** will considerably help **research efforts** in the **polar regions**.

"The poles, like the deep ocean, are still very, very sparsely investigated," she said. "It's an area which defines how our future weather and climate will be, and that's why it is so important."

Chinese research solves.

Matthew P. **Funaiole et al. 23**. Vice president of the iDeas Lab, Andreas C. Dracopoulos Chair in Innovation, and senior fellow in the China Power Project at the Center for Strategic and International Studies (CSIS). With Brian Hart, Joseph S. Bermudez Jr., Aidan Powers-Riggs 4-18-2023. "Frozen Frontiers: China's Great Power Ambitions in the Polar Regions." CSIS. 4-18-2023. https://features.csis.org/hiddenreach/china-polar-research-facility/

China's pursuit of great power status is drawing it to the frozen reaches of the world's polar regions. In both the Arctic and Antarctic, **China** has undertaken ambitious expeditions and **developed world-class research facilities**. These investments have elevated China's voice in polar affairs and afforded it an opportunity to shape the emerging geopolitical landscape.

Its growing physical footprint in the world's most remote frontiers also serves to advance China's broader strategic and military interests.

In the Arctic, melting ice sheets present a host of significant challenges for the global community. While leaders in Beijing are clear-eyed about the threats posed by climate change, Chinese strategists also see a potential silver lining.

The changing Arctic environment is expected to open new shipping routes that could reduce transit times for seaborne trade and make it easier for China to access the region's natural resources.

Yet without sovereign jurisdiction in the Arctic, China leans on partnerships with other states to further its interests.

China has two permanent research stations in the region, one located in Norway's **Svalbard archipelago** and the **other** in **Iceland**. Both sites support a diverse range of **research**, from **marine ecology** to **atmospheric physics**.

A third facility being utilized by China in northern Sweden is under scrutiny due to suspected ties to the People's Liberation Army (PLA), jeopardizing China's access to the site.

Beijing faces mounting roadblocks elsewhere. Several Arctic countries—including the United States—have voiced concerns about China's presence in the region.

Left with few other options, China is stepping up its investments in Russia as it looks to Moscow as its strategic partner of choice in the Arctic.

This may prove to be China's best path forward as both the climate and geopolitical competition heat up in the Arctic.

Arctic Aspirations

Despite being situated some 1,400 km (nearly 900 miles) south of the Arctic circle, China has styled itself a "near-Arctic state" and declared its ambitions to become a "polar great power" (极地强国) by 2030.

A 2018 Arctic policy white paper asserts that developments in the region have "a vital bearing" on China and lays out Beijing's vision for utilizing the region's natural resources and shaping Arctic governance.

Beijing has sought to access the region largely through scientific and commercial ventures, which officials claim give it the "right to speak" on Arctic affairs.

While China's **Arctic research** is **primarily** focused on **advancing scientific knowledge**—contributing to **significant** discoveries related to **sea ice composition,** space weather, and **marine life**—these accomplishments also serve Beijing's broader strategic objectives.

AT: Resources Advantage

Turn- Plan Causes Warming

The plan causes warming:

1. Icebreakers destroy sea ice, which increases global temperatures.

Johanna **Cohn 22**. Environmental studies intern at CASSE. "Icebreakers in the Arctic: An Overlooked Environmental Concern." Center for the Advancement of the Steady State Economy. 4-14-2022. https://steadystate.org/icebreakers-in-the-arctic-an-overlooked-environmental-concern/

What's Missing from the Conversation?

Little information is available about the environmental concerns that icebreakers pose. Literature highlights the perceived "positives"—scientific exploration, search and rescue, trade and shipping, and competition amongst nations—as being more important than considering environmental degradation. However, here's what we know.

Icebreakers break ice. As the **broken ice melts**, **sunlight** is **absorbed**, leading to increased **temperatures**, and **thus more ice melting**. An icebreaker cruising through the ice for 1,000 kilometers (620 miles), leaving an ice-free wake of ten meters (33 feet), would open an area of water ten square kilometers (**3.9 square miles**) over the entire cruise. Although the Arctic Sea covers about 4,000 kilometers (2500 miles), **any amount** of **ice breaking harms** the **environment**. With the **continual** use of **icebreaker ships**, the **Arctic** will continue to look more like **ice cubes melting** in a **glass of water**.

As **melting endures**, we will continue to see **environmental effects** around the world. Changes in the Arctic Sea ice pattern leads to a rise in sea levels globally. Low-lying developed areas in the Gulf Coast and the mid-Atlantic regions are especially at risk from sea-level rise. The recent growth of coastal areas has resulted in larger populations and more valuable coastal property being at risk from sea-level rise. Major physical impacts of a rise in sea level include erosion of beaches, inundation of deltas as well as flooding and loss of many marshes and wetlands. Increased salinity will likely become a problem in coastal aquifers and estuarine systems because of saltwater intrusion.

Changes in **Arctic ice patterns** are also **leading** to more **frequent extreme weather**. In the past few years, such extreme weather has been seen particularly across the east coast of the USA, western Europe, and central Asia. These regions will continue to experience more extreme weather because of Arctic amplification, the enhanced sensitivity of high latitudes to global heating. Arctic ice melt has also been shown to distort the flow of and weaken the jet stream, resulting in more frequent periods of intense heat and ferocious cold.

There's also evidence that the sound **emitted** from **icebreakers** is **detrimental** to **marine animals**, particularly **whales** and **other large mammals**. The sound interferes with their ability to communicate with their pods. Additionally, sound pollution likely has long-term effects that are difficult to predict.

2. Extraction of Arctic resources causes climate change.

Elena F. **Tracy 23**. Senior Advisor, Sustainable Development | WWF Global Arctic Programme. "Extractivism is damaging Arctic ecosystems and warming the global climate." WWF Arctic. April 2023. https://www.arcticwwf.org/the-circle/stories/extractivism-is-damaging-arctic-ecosystems-and-warming-the-global-climate/

As a concept, "**extractivism**" has gained attention recently as **mining** and **mineral exploration companies eye frontiers** that were once inaccessible: the ocean seabed, the marine offshore, areas of the **high north** and more. Naomi Klein, the prominent Canadian environmental author who wrote This Changes Everything—a book about the climate crisis—describes extractivism as "a dominance-based relationship with the earth" and connects it to what she calls sacrifice zones: "places that, to their extractors, somehow don't count and can therefore be poisoned, drained or otherwise destroyed."

The fossil fuel projects across the Arctic region—in Russia, Norway and Alaska (the US)—are exactly that: **sacrifice zones**. Once extracted, hydrocarbons are exported over **long distances** for **use** in **other parts** of the **world**, where they contribute to the increase of **global carbon emissions** and **exacerbate the climate crisis.** As discussed in a research brief recently published by the WWF Global Arctic Programme, this increasing interest in Arctic fossil fuel production is completely out of touch with the Paris Agreement to hold **global warming to 1.5°C or less**. By 2030, the volume of **fossil fuels** produced in the **Arctic** will be **double** the **amount** that is **consistent with that goal**. By 2050, the **gap may reach 700 percent**.

Icebreakers superheat the Arctic. It turns the region into "ice cubes melting in a glass of water."

Smruthi **Nadig 23**. Master's degree in International Journalism from the University of Leeds. "The nuclear icebreakers enabling drilling in Russia's Arctic." Mining Technology. 8-8-2023. https://www.mining-technology.com/features/the-nuclear-icebreakers-enabling-drilling-in-russias-arctic/

Arctic to look like "**ice cubes melting** in a **glass of water**"

Icebreakers play a crucial role in providing response capacity for crises and disasters in ice-covered waters. They also improve the capability of government marine safety agencies, and improve response to environmental catastrophes like oil spills. Currently, international flights cannot fly over the Arctic for lack of maritime rescue services, something that could change if Russia expanded its investment in the Arctic.

However, the main purpose of the icebreakers is **simply to break ice**. Broken ice **melts** more **easily**, becoming water that **absorbs more sunlight**. This causes an increase in **local temperatures**, thus **leading to more ice melting.**

The **Arctic is warming** much **faster** than the **rest of the world** as the high sunlight **reflectivity**, or albedo, of **Arctic ice is lost**. Compared to ice, seawater absorbs **more sunlight**, meaning that water then **warms up** and **evaporates** more readily, itself becoming a **greenhouse gas**.

Small ships can have **big effects** in the Arctic. Non-profit US think tank the Center for the Advancement of the Steady State Economy reported that an icebreaker ship passing through the ice for around 620 miles, which leaves an ice-free wake of 33 feet, would open an area of water of 3.9 square miles over the entire cruise.

Even though the Arctic Sea covers around 2,500 miles, **all icebreaking harms the environment.** Continuous use of icebreaker ships in the Arctic would lead to looking more like "ice cubes melting in a glass of water," the report says.

FExtraction of resources decimates the Arctic and causes us to burn more fossil fuels.

Elena F. **Tracy 23**. Senior Advisor, Sustainable Development | WWF Global Arctic Programme. "Extractivism is damaging Arctic ecosystems and warming the global climate." WWF Arctic. April 2023.

https://www.arcticwwf.org/the-circle/stories/extractivism-is-damaging-arctic-ecosystems-and-warming-the-global-climate/

The lack of reciprocity in the economy of **oil and gas production** is obvious: the mass-scale removal of resources **for export** creates an accumulation of financial benefits far away from the sites of their extraction, enriching distant shareholders, investment funds and **oil CEOs**. But locally, these projects **pollute rivers**, **marine coastal environments**, **landscapes** and the **air**. An oil spill in the Arctic would also **devastate ecosystems** and **Indigenous ways of life.** The impacts could be irreversible, wiping out wildlife populations and destroying traditional food systems and livelihoods.

Marine mammals are particularly undermined by **Arctic extractivism**: they suffer from **underwater noise** caused by an increasing number of offshore **seismic surveys** and **growing shipping traffic** as the **sea ice melts** and makes the Arctic Ocean easier to **navigate**. In fact, the fossil fuel, **mining** and **shipping industries** are the **biggest drivers** and **beneficiaries** of ice melt in the Arctic. A 10-fold increase in shipping traffic through the Northern Sea Route is expected from now to 2035, and negative impacts on pristine and sensitive marine and coastal environments will be unavoidable.

Given that the Arctic will only continue to attract more industrial development in the years to come, it is important to find a balance between creating jobs and protecting natural environments. To ensure a healthy future for all, the Arctic economy needs to foster investments in human capital, renewable energy and the sustainable blue economy and apply ecosystem-based management. The agreement reached at the United Nations Framework Convention on Climate Change Conference of the Parties (COP28) to transition away from fossil fuels—and triple renewable energy capacity by 2030—is a good first step. But ensuring that governments step up and phase out fossil **fuels will be critical** to the **Arctic's future**—and the **world's**.

Arctic Not Key

Arctic mineral resources are not special. We could mine critical minerals from other regions.

Philip **Andrews-Speed 25**, Senior Research Fellow, OIES. "Can the Arctic be a significant contributor of critical minerals for the global energy transition?" Februrary 2025. Oxford Institute for Energy Studies. https://www.oxfordenergy.org/wpcms/wp-content/uploads/2025/02/SP36-Critical-Minerals-in-the-Arctic.pdf

Conclusions

This paper provides a preliminary overview of the potential of the Arctic to make a significant contribution to the **supply** of **critical minerals** for the **low-carbon energy transition.** A key limitation of the study is its reliance on a selection of publicly available literature in English.

Before presenting the conclusions, it is worth reiterating that the mineral geology of the **Arctic** is **not special**. The particularities are the various physical and human geographic factors that render the costs and timelines for mineral extraction in the Arctic greater than in many other parts of the world. Of these, infrastructure is likely to prove the most important. Thus, new production is likely to come from regions with existing mines. Nevertheless, all the countries studied, with the possible exception of Russia, have published or will soon publish mineral strategies that seek to boost the exploitation of minerals, including in Arctic regions. These new strategies reflect the growing demand for critical minerals. The Nordic countries of Norway, Sweden and Finland are particularly important for the European Union.[120] Their Arctic regions already have good mining and transportation infrastructure.

Climate change will have a variety of impacts on Arctic transportation infrastructure. On the one hand, ice sheets will retreat, winters will be less harsh and sea routes will be open for longer each year. On the other hand, melting permafrost will disrupt existing installations and increase the cost of new ones.

The question of whether the Arctic can contribute a significant share of global supplies of critical minerals can be addressed at three timescales: today, over the next ten years to 2034, and beyond 2034. For the purposes of this report, we will take a proportion of 10 per cent or higher as being 'significant'.

The situation today

As presented in Section 2 of this report, the Arctic today supplies a significant share of global supplies for only three minerals: platinum (<13 per cent), palladium (<44 per cent), and possibly nickel (<11 per cent). However, the Arctic's share of global reserves of these three minerals is less than the share of global production: <7.8 per cent for platinum group metals and <8.1 per cent for nickel. The shares of silver and phosphate production in the Arctic may be as high as 8.4 per cent and 6.8 per cent respectively, but this is highly uncertain. Reserves of silver in Arctic countries amount to 19 per cent of the global total, but how much of this lies in the Arctic is not known. For all the other critical minerals, the Arctic's share of global production is less than 5 per cent. Among these, the largest shares are for copper (<4.1 per cent) and cobalt (<3.8 per cent). Reserves of these two minerals in the Arctic amount to <8 per cent and <2.3 per cent respectively. For two metals, the Arctic's share of reserves is significantly higher than the share of production: rare earths (<11 per cent) and graphite (<5 per cent). The Arctic also makes a contribution to global supplies of byproducts such as tellurium (<16 per cent), selenium (<10.2 per cent), and germanium (<3.6 per cent).

Russia is the dominant Arctic producer of most of these minerals, as well as being the main producer of copper and aluminium metals and of byproducts such as germanium, selenium, and tellurium. While Canada produces several of these minerals, most of this production is not in the Arctic, with the major exception of nickel. Finland contributes to global chromium and phosphate supplies, Alaska to silver supply, Norway to graphite and silicon metal supplies, and Iceland to the global supply of aluminium.

To summarise: the Arctic makes significant contributions (>10 per cent) to the global supply of **critical mineral ores** in only **three cases** (platinum, palladium, and nickel) and to one – and possibly two – byproduct metals (tellurium and selenium).

The period to the mid-2030s

Exploration for rare-earth minerals has increased across the world since 2016 although we lack the data to show how this is reflected in the Arctic, with the exception of Sweden where the rise in exploration budgets has been dramatic. The reopening of previously closed mines could lead to increased production of critical minerals, and exploration could boost reserves, provided annual production does not exceed the rate of growth of reserves. This problem can be obviated in part through recycling.

In order to be economically viable in the Arctic, even with state support, mineral deposits need to be relatively large and/or high-grade. To make a significant contribution to global supplies, they would ideally form a large mineral province comprising several deposits. The copper, cobalt, nickel, and platinum group metal province in the Taymyr region of the Russian Arctic is an example. Many such geographically extensive mineral provinces are hosted within blocks of ancient geological crust known as cratons. The major cratons in the Arctic where the ancient rocks are exposed at the surface lie in Russia (northern Siberia and Taymyr), northern Canada, Greenland, Finland, Sweden, and northern Norway.[121] However, many types of mineral occurrence occur in quite different geological settings. Nevertheless, the Arctic regions of Russia and Canada are much larger than those of the other Arctic countries. On these grounds alone, we should expect production of critical minerals in their Arctic regions to rise faster and be larger than in the other Arctic countries.

Most new production that comes online between now and the mid-2030s is likely to be from mineral reserves that are already proven, or from areas adjacent to existing known deposits. How rapidly production may rise in each country will depend on a variety of inter-related factors, including the extent of state policy support, the availability of capital, the risk appetites of investors, the nature of the mineral deposits, the regulation of environmental and social issues, and the scale of existing mining operations and infrastructure in the relevant region. In many, the processing of the mineral ores will take place in sub-Arctic locations.

Given the scale of its current mining operations in the Arctic and its need to boost mineral production and exports, it is possible that the most marked growth in production between now and 2034 will be in Russia. Further, this production is likely to be for minerals in regions where mining is already taking place, such as Taymyr and Kola. But much will depend on the availability of finance, a challenge that has been exacerbated by the withdrawal of most foreign investors.

Exploration and feasibility studies in the Arctic regions of the other countries will certainly identify **new reserves** and **potential mines**. However, it is likely that **few** of these will add significantly to the Arctic's share of the **global supply** of critical **minerals** in the **next ten years**. That being said, they may start to provide additional sources of supply of critical mineral ores for western Europe and North America. To take full advantage of this, it will be necessary to build refineries to produce the required metals. These refineries need not be in the Arctic, nor even in the same country as the ore production.

The period beyond 2034

The period beyond 2034 is when the Arctic regions could possibly start to provide a greater share of global supplies of critical minerals. The speed at which this takes place will depend on factors additional to those governing the period to 2034. First is the rate of growth of demand for different critical minerals. This will be shaped by demand for final products that rely on critical minerals,

the nature of the technology in these appliances that determines which minerals are in demand, and the scale of recycling of critical minerals and metals. Second is the economic competitiveness of critical mineral supplies from Arctic regions compared with those from the rest of the world. All things being equal, significant additional supplies from the Arctic are likely to come mainly from high-grade deposits where government support is strong. The exact locations of the mines will vary between minerals, but Russia and Canada are likely to feature strongly for several minerals. Other countries may become regionally important suppliers for specific minerals, for example Greenland and Sweden for rare earths. Sub-sea exploitation is likely to have started as well.

In summary, the Arctic is **unlikely** to **make** a **significant contribution** to the future **global supply** of **critical minerals**. Indeed, the region's share of the global production of many critical minerals is likely to **decline** as **production** grows in other **areas**. However, national and regional strategies could contribute to the diversification of supply sources for certain mineral importing countries. This may be particularly important for Europe and North America.

Icebreakers aren't key AND we could get resources from Russia and China.

Josh **Caldon 23**. Adjunct professor at the Air University where he instructs courses in national security. He received his PhD in Political Science from the University of Albany and is a veteran of the USAF. "Why the US is Losing The Race for the Arctic and What to Do About It." CIMSEC. 4-13-2023. https://cimsec.org/why-the-us-is-losing-the-race-for-the-arctic-and-what-to-do-about-it/

Economically speaking, the Arctic will likely remain a **backwater** for **market-driven economies** for the **foreseeable future**. The relatively **high costs** of extracting **resources** and **transporting goods** from the Arctic means the region is **unlikely** to become much more **attractive** for **Western companies**, **even if** the ice continues to retreat (which has slowed in recent years) and **icebreakers improve**, except in times when specific resources are in **sharp demand** or when there are long-term **bottlenecks** in other **trade routes**.

The **resources** that **Russia** and **China** extract from the **Arctic** will **contribute** to the overall **global supply** of these **resources** and **decrease** their overall price for **American consumers**. As such, **Americans** will **gain many of the benefits of Russia's** and **China's efforts** in the Arctic while **Russia** and **China absorb the costs.** In the case of scarce rare-earth minerals that have spiked in demand and are monopolized by China, it appears Sweden may fill this void for the US with its own **Arctic resources**, even as companies search for **substitutes** for these critical **resources**.

Overall, the US should not ignore the Arctic, and it should put to rest the notion that this region is a **unique zone** of **peace** in an **otherwise quite turbulent world**. That being said, Americans should also not deem that losing the "race for the Arctic" will critically threaten America's larger national interests. By not attempting to compete head-to-head with Russia or China to "conquer" the region, the US has incurred some advantages against these competitors.

Exploiting resources in the Arctic is not economical even with better icebreakers.

Scarlett **Evans 25**. Freelance writer with a focus on emerging technologies and the minerals industry. Previously, she served as assistant editor at IoT World Today, where she specialized in robotics and smart city technologies. "Mining in the Arctic: a rare earth 'cold rush'?." Mine. February 2025. https://mine.nridigital.com/mine_feb25/arctic-mining-rare-earths

In its 2024 Economic Report, the Arctic Economic Council (AEC) highlighted the potentially pivotal role mining in Arctic nations could play in fuelling the world's increasing **demand** for **critical raw materials**.

It stated that the Arctic region, which encompasses parts of eight separate countries, is home to 31 of the 34 materials identified as essential for clean energy technology.

Of note within these are rare earth elements (REEs), materials necessary for a range of clean energy technologies including electric vehicles (EVs), batteries and wind turbines. REEs in particular are being eyed up in Norway, Sweden and Greenland.

Mining is **not new** to the Arctic region. Alaska is home to the largest zinc mine in the world and Sweden to the largest iron ore mine in Europe. However, **high wages** and **strict regulatory frameworks** have been something of a **deterrent** to mining **companies' activity** in the region as they **typically** want to **extract** as much as possible with **minimal overheads**.

Short daylight hours and extreme cold have also proven to be a hurdle to investors looking to **build infrastructure** in the Arctic, as well as companies that must provide high wages to attract any kind of workforce. The result is that the **region's mineral** potential has **remained** relatively **untapped despite** its **resources** – something the AEC, among others, is looking to change.

Mining in the Arctic is prohibitively expensive. The private sector alone will never do it.

Scarlett **Evans 25**. Freelance writer with a focus on emerging technologies and the minerals industry. Previously, she served as assistant editor at IoT World Today, where she specialized in robotics and smart city technologies. "Mining in the Arctic: a rare earth 'cold rush'?." Mine. February 2025. https://mine.nridigital.com/mine_feb25/arctic-mining-rare-earths

What challenges lie ahead for Arctic mining?

There is a stereotypical perception of the Arctic as a vacant expanse of ice and sea – a polar tundra that is more like Antarctica. While the perception is untrue, **extreme temperatures**, **remote locations** and **short days** have meant **working** in the region is not **without its challenges**.

In 2019, Guggenheim Partners, an investment firm that helped develop the Arctic Investment Protocol alongside the World Economic Forum, projected that to establish the infrastructure needed for a connected Arctic, **$1trn would be needed over the next 15 years.**

If done correctly, a fully-**fledged mining industry** could bring significant benefits to local Arctic economies and communities as well as the global stage, but there is the caveat that it will **require** a lot of **work**.

"Building a better Arctic – and a better world – requires long-term capital that carefully weighs environmental and societal impact to support sustainable growth," the report stated. "It demands an entirely new framework for investment on a truly massive scale."

Mads Qvist Frederiksen, executive director at the AEC, says private funding alone is not enough to bolster mining development in the Nordic Arctic. Credit: Arctic Economic Council

Significant investment is also needed to attract (and keep) a workforce. In the Nordic regions particularly, **salaries**, **taxes** and **royalties** are **typically higher**, and must remain so if workers are expected to work **long hours** at **isolated**, **cold mine sites**.

"**Private funding alone** won't be **enough**," says Frederiksen. "LKAB is a good example because they have attracted investment from the government and the EU, but as this is state-owned it brings up the question of whether it is only state-owned companies' [projects] that will be developed?"

The US doesn't need icebreakers to access Arctic resources.

Paul **Avey 19**. Assistant professor of political science at Virginia Tech. "The Icebreaker Gap Doesn't Mean America is Losing in the Arctic." War on the Rocks. 11-28-2019. https://warontherocks.com/2019/11/the-icebreaker-gap-doesnt-mean-america-is-losing-in-the-arctic/

Finally, **icebreakers** do **not give states** the **ability** to **claim resources** that will become **available** as climate change leads to less ice coverage. "Most Arctic territory and resources are **solidly** within the **jurisdictions of Arctic states**," writes Kuersten. This is not the 19th century, when prospectors or military forces could stake claims to new territory. For example, Douglas Porch recounts how preoccupation with "effective occupation" led French military forces in Africa to sacrifice basic prudence in a "desire to steal a march on international competition." There should be no rush — and is no need — to repeat these mistakes. Indeed, the Pentagon's recent Arctic strategy notes that even "Russia has generally followed international law and procedure in establishing the limits of its extended continental shelf."

To be sure, icebreakers are necessary to access polar areas even as ice cover diminishes. They are an important element of Arctic sovereignty as a result. **However**, the number that other countries possess does not affect the number that the **United States** requires to **provide access** to its **exclusive economic zone**. It is also unlikely that a country would use icebreakers to stake a claim to the U.S. Arctic. If it did, **capabilities** other than **icebreakers** would be better suited to dislodging them should diplomacy fail.

No Warming Impact

Climate change doesn't cause extinction. Humans can adapt.

Nicola **Scafetta 24**. Ph.D.; Associate Professor, Department of Earth Sciences, University of Naples Federico II. "Impacts and Risks of 'Realistic' Global Warming Projections for the 21st Century." Geoscience Frontiers, Volume 15, Issue 2.

The ECS of the CMIP6 GCMs ranges between 1.8 °C and 5.7 °C, but the **IPCC AR6** acknowledged the existence of a "**hot**" **model problem** and claimed that the **actual ECS** may likely range between 2.5 °C and 4.0 °C, with a **best estimate** of around 3.0 °C (Sherwood et al., 2020, Hausfather et al., 2022). However, **recent research** suggests that the expected ECS range should vary within **lower values** between 1.5 °C and 3 °C (Nijsse et al., 2020, Scafetta, 2022, Scafetta, 2023a, Lewis, 2023, Spencer and Christy, 2023). Furthermore, according to a **number of empirical studies**, the **actual ECS values** could even be **significantly lower**, ranging between 1 °C and 2 °C (Lindzen and Choi, 2011, Scafetta, 2013, Scafetta, 2023c, Bates, 2016, McKitrick and Christy, 2020, Stefani, 2021).

The IPCC AR6 investigates a range of SSP scenarios for the 21st-century without assigning a probability to their plausibility. In any case, despite the **questionable visibility** given to SSP5-8.5 (the **worst-case scenario**), which yields the largest and **most alarming** projected global warming of up to 4–8 °C (66%) by 2080–2100, table 12.12 of the IPCC AR6 (Masson-Delmotte et al., 2021, p. 1856) **already reports** for the **entire 21st century** Didence in the **direction of any change** in the frequency, severity or extent of frost, river floods, landslides, aridity, hydrological drought, **agricultural and ecological drought**, **fire weather**, mean wind speed, severe wind storms, tropical cyclones, sand and dust storms, heavy snowfall and **ice storms**, hail, snow avalanche, coastal floods, coastal erosion, marine heatwaves, **air pollution weather** or **radiation** at earth's surface. Medium and high confidence of changes are mostly expected in climatic impact-driver types more directly associated with increasing atmospheric CO2 concentration at surface and global warming such as increasing mean air temperature, extreme heat, sea level, mean ocean temperature, ocean salinity and ocean acidity; with decreasing cold spell, snow, glacier and ice sheet, permafrost, lake, river and sea ice, and dissolved oxygen; mean precipitation will increase in some regions and decrease in others.

However, **recent research** argued that the alarmistic SSP3-7.0 and **SSP5-8.5 scenarios** are likely and **very likely unrealistic**, respectively (Burgess et al., 2020, Hausfather and Peters, 2020, Pielke and Ritchie, 2021a). These

studies indicate that the radiative forcing functions derived from the SSP2-4.5 (or even SSP2-3.4) scenario are the **most plausible**. The SSP2-4.5 is a moderate scenario; it projects about **half of the 21st-century warming** than what the SSP5-8.5 scenario does (Fig. 1) and is thus far less alarming.

With the aforementioned factors in mind, it was proposed here to use only the SSP2-4.5 scenario and the GCMs with ECS ≤ 3 °C to **more precisely** assess "**realistic**" global and regional impacts and risks that could be associated with climate changes that are expected to occur in the 21st century, and to compare them with the Paris Agreement warming target of keeping global surface temperature < 2 °C above the pre-industrial levels throughout the 21st century. To **optimize the result** even more, the simulation ensembles containing the low, medium, and high-ECS macro-GCMs were **linearly scaled** to **best reflect** the **real global surface warming** recorded from 1980–1990 to 2012–2022.

According to the IPCC, if there is little-to-no adaptation, the impacts and risks of projected climate change will be moderate-high (orange-red flag) by 2040–2060, and the situation might worsen considerably by 2100 even if the SSP2-4.5 moderate scenario is implemented. In fact, according to the analysis reported in Table 3, the GCMs within the IPCC's preferred ECS range of 2.5–4.0 °C project a warming of 1.98–3.82 °C by 2080–2100. Thus, the IPCC (Masson-Delmotte et al., 2018) analysis suggests that only net-zero-emission scenarios like the SSP1-2.6 (which could produce a warming of 1.26–2.82 °C by 2080–2100) should be adopted to avoid too dangerous climatic changes, which are expected to begin if global surface temperatures rise more than 2–2.5 °C above the 1850–1900 level in a few decades (Gao et al., 2017, Tol, 2015). Climate-change alarmism and world-wide proposals for prompt implementations of net-zero emission policies are only based on such claims.

However, using only the low-ECS models (ECS ≤ 3.0 °C) and the SSP2-4.5 scenario, Table 3 suggests that **global warming** in the 21st century will be **moderate**, ranging from 1.36 °C to 2.25 °C (median 1.77 °C) by 2050 and from 1.96 °C to 2.83 °C (median 2.28 °C) by 2080–2100, which partially overlaps with the upper warmer half of the climate projection obtained using the SSP1-2.6 scenario and the GCMs with ECS of 2.5–4.0 °C. Thus, climate change impacts and risks will worsen by the end of the 21st-century, albeit at a **slower rate** than **predicted by the IPCC** using the same SSP2-4.5 scenario. As a result, the SSP2-4.5 scenario, which is moderate and affordable, may be close enough to roughly meet the Paris Agreement warming target, whereas the SSP2-3.4 scenario, which could be even more realistic (Pielke et al., 2022), should even more likely fully meet it.

I also proposed an alternative methodology for estimating "realistic" 21st-century climate projections and assessing their respective impacts and risks. In fact, the low-ECS macro-GCM appears to be slightly **warmer** than global surface temperature records and there are serious concerns about the reliability of the global surface temperature records, which cannot be ignored. In fact, their warming appears to be **excessive** in comparison to **alternative temperature records**, such as **satellite-based** ones relative to the lower troposphere (Spencer et al., 2017, Zou et al., 2023), and there are **various evidences** suggesting their **contamination** from urban heat islands and other **non-climatic surface factors** (Connolly et al., 2021, Scafetta, 2021a, Scafetta, 2023b, Soon et al., 2023, Spencer, 2023). There are also concerns regarding the ability of the GCMs to properly reconstruct decadal to millennial natural climate oscillations (e.g.: Scafetta, 2013, Scafetta, 2021b, Scafetta, 2023c). As a result, **all GCMs** may be **grossly inadequate** for estimating climate change in the 21st century, as also McKitrick and Christy (2020) concluded. Thus, the models likely need to be corrected and upgraded with new relevant physical mechanisms. It is possible to agree with McCarthy and Caesar (2023) who recently showed the inability of the CMIP5 and CMIP6 GCMs in properly hindcasting the Atlantic Meridional Overturning Circulation and concluded "if these models cannot reproduce past variations, why should we be so confident about their ability to predict the future?".

To address the above issues, I have proposed an **alternative methodology** that uses **empirical modifications** of the **actual GCM projection ensembles** via **appropriate linear scaling** in such a way to simulate the outputs of **hypothetical climate models** that could **accurately represent** the warming observed from 1980 to 2022. The 1980–2022 period was selected because it is covered by a variety of temperature records with low statistical errors. This methodology would essentially simulate hypothetical GCMs that are supposed to optimally reproduce the data. Simple testing validates the proposed methodology because scaling the projection ensembles of the three macro-GCMs to a similar level from 1080–1990 to 2011–2022 results in projection ensembles that approximately overlap throughout the 21st century.

The proposed methodology may also be justified by considering that the GCMs are extremely sensitive to small modifications of their internal free parameters, in particular to those regarding cloud formation, and even GCM modelers adopt complex tuning

approaches to explicitly calibrating them to better match historical data (Mauritsen and Roeckner, 2020, Mignot et al., 2021). Section 4 proposes and investigates several of these modeling approaches, the results of which are depicted in Fig. 5, Fig. 7.

If the warming of the HadCRUT5 record from 1980 to 1990–2011–2022 is assumed correct, it is found that the SSP2-4.5 scenario produces climate projections similar to those produced by the low-ECS macro-GCM. In fact, the projected warming ranged from 1.65 °C to 3.03 °C by 2080–2100, with a median of 2.28 °C (Table 4, case #1). This conclusion is unsurprising given that the low-ECS macro-GCM has already successfully recreated the HadCRUT5 warming.

However, if the reference warming is that reported by lower troposphere satellite temperature data (Spencer et al., 2017, Zou et al., 2023), the warming of the low-ECS macro-GCM simulations must be lowered by about 30%. As a result, global warming by 2080–2100 is projected to range from 1.18 °C to 2.16 °C (median 1.63 °C) above pre-industrial levels using the SSP2-4.5 scenario (Table 4, case #2), which is well below the (safe) threshold of 2.0 °C and is even cooler than the 1.26–2.82 °C estimate obtained with the GCMs with ECS within the IPCC likely range of 2.5 °C and 4.0 °C using the SSP1-2.6 net-zero emission scenario.

A similar result was obtained with an empirical climate model that assumes that the global surface temperature record is sufficiently accurate, but also takes into account temperature changes caused by empirically identified large climate cycles and/or solar effects that the CMIP6 GCMs do not replicate (Scafetta, 2010, Scafetta, 2013, Scafetta, 2021b); this case projects a warming ranging from 1.15 °C to 2.52 °C with median 1.78 °C by 2080–2100 (Table 4, case #3). Unfortunately, the IPCC ignores such semi-empirical modeling of the climate system although it has been developed and discussed in the scientific literature, and it should not be dismissed lightly given that the GCMs fail to reproduce the natural oscillations observed throughout the Holocene. They do not, for example, reproduce any of the Holocene warm periods, such as the Roman and Medieval warm periods, which indicate a quasi-millennial oscillation, a quasi-60-year oscillation, and many other natural climate oscillations. Also this kind of empirical modeling predicts very modest ECS values, ranging at least between 1 and 3 °C, but more likely between 1 °C and 2 °C (Lindzen and Choi, 2011, Scafetta, 2013, Scafetta, 2021b, Scafetta, 2023c, Bates, 2016, Stefani, 2021).

In conclusion, as Hausfather and Peters (2020) pointed out, it is past time to stop treating the worst-case climate change scenarios (e.g., SSP3-7.0 and SSP5-8.5) as the most likely outcomes, because only realistic and pragmatic scenarios, such as SSP2-4.5 or SSP2-3.4, can lead to sound policies that can be accepted by all nations. Furthermore, net-zero scenarios such as SSP1-2.6 look to be equally unattainable, as the depletion of crucial metals required for low-carbon solar and wind technologies, as well as electric vehicles and their chargers, appears to make low-carbon technology production impossible on the very large scale required to substitute fossil fuels (Groves et al., 2023). In fact, despite the IPCC AR6 reports are rather alarming because global surface temperatures were projected to rise by up to 4–8 °C above pre-industrial levels according to unrealistic shared socioeconomic pathways (see Fig. 1 and Masson-Delmotte et al., 2021), with catastrophic consequences in many situations (Pörtner et al., 2022), Fig. 5, Fig. 7, Fig. 8 show that "**realistic**" climate change impacts and risks for the 21st century will likely be **much more moderate** than what the IPCC claims. This is because there is a growing **body of evidence** that the **actual ECS** may be rather low (1.5–3.0 °C, or even 1–2 °C) for a variety of reasons derived from direct CMIP6 GCM assessments, likely **warming biases** affecting global surface temperature records, and a (likely solar induced) **natural variability** that the **current climate models** do not reproduce. According to the semi-empirical climate modeling proposed above, the climate system will likely warm by less than 2.0–2.5 °C by 2080–2100, and on average less than 2.0 °C, also if the moderate SSP2-4.5 scenario is implemented. As a result, rapid decarbonization and net-zero emission scenarios such as the SSP1-2.6 are shown to be unnecessary to maintain global surface temperature < 2 °C throughout the 21st century.

Fig. 9 employs the climate "thermometer" proposed by Climate Action Tracker (2022) to summarize the above findings by contrasting the projections derived from the IPCC climate assumptions, where only the SSP1-2.6 net-zero emission scenario could satisfy the 2.0 °C target, with the new proposed assessments of "realistic" global warming impacts and risks obtained using the three semi-empirical models discussed above with the pragmatic SSP2-4.5 scenario that approximately agrees with the real world action based on current policies (Tables 3B and 4).

As a result, despite predictions that the climate system would continue to warm throughout the 21st century, there is **no compelling evidence** of an **impending global disaster** caused by manmade greenhouse gas emissions. The 2.0 °C Paris-agreement warming target for the 21st century can likely be met even under the feasible and moderate SSP2-4.5 emission scenario because future climate change is expected to be modest enough that any potential related hazards can be addressed efficiently through effective and low-cost adaptation strategies, without the need for implementing rapid, expensive, and technologically likely impossible net-zero decarbonization policies.

The scientific consensus confirms that climate change will not cause extinction.

Aaron Krol citing Adam **Schlosser 23**. *Contributor, MIT Climate Portal. **Senior Research Scientist, Center for Global Change Science, Massachusetts Institute of Technology; Deputy

Director, Joint Program, Massachusetts Institute of Technology. "Will Climate Change Drive Humans Extinct or Destroy Civilization?"
https://climate.mit.edu/ask-mit/will-climate-change-drive-humans-extinct-or-destroy-civilization

First, the good news: **climate scientists**, as a whole, are not warning us to prepare for the apocalypse. The **most recent report** of the Intergovernmental Panel on Climate Change (**IPCC**) — a group of hundreds of scientists working with the United Nations to analyze climate change research from around the world — names many serious risks brought on by the warming of our planet, but human extinction is **not among them**.1

"If I had to rate odds, I would say the **chances of climate change** driving us to the point of human extinction are **very low**, if not **zero**," says Adam Schlosser, the Deputy Director of the MIT Joint Program on the Science and Policy of Global Change and a climate scientist who studies future climate change and its impact on human societies.

In some ways, the **most recent climate science** even shows some encouraging trends. IPCC reports have always spelled out different scenarios for the amount of climate-altering greenhouse gases humans will put into the atmosphere, to show a range of possible climate risks the world may face. The IPCC calls these scenarios "representative concentration pathways" (RCPs), and they range from the relatively mild RCP2.6 scenario all the way up to RCP8.5, whose risks would be calamitous.

But as the world has made progress in **recent years** on **switching to clean energy** and controlling our **greenhouse gas emissions**, it has become clearer that we are not, in fact, headed toward the **worst-case scenarios**. "RCP8.5 is being **viewed more and more** as an **extreme outcome**," says Schlosser. Even with **no further progress** on climate action, he says, the less-dire RCP6.0 scenario now looks closest to reality.

None of the most intensive models assume adaptation.

Devin **Hartman 23**. director of Energy and Environmental Policy at the R Street Institute. "Low-Energy Fridays: Climate Change Is—and Is Not—an Existential Risk." 12/15/23. https://www.rstreet.org/commentary/low-energy-fridays-climate-change-is-and-is-not-an-existential-risk/

The 2023 United Nations Climate Change Conference is over, but **undercurrents** of existential anxiety persist. This is a **timely reminder** that climate policy begins with **characterizing** the problem correctly. Perhaps **no frame** has been more **hotly debated**—and **misunderstood**—than whether climate change poses an **existential risk**. As this week's title reveals, the answer is **not definitive**. But understanding the circumstances under which climate change is and is not an existential risk has profound bearing on whether our policy response benefits or harms humanity. An existential risk threatens the existence of a subject, such as a community, a nation state, or even humanity as a whole. In this sense, climate change does present such a risk to certain communities or nation states, such as low-lying island countries susceptible to sea-level rise. Climate change is, to a degree, a matter of **life or death,** considering how it may **shift** mortality patterns around the world. But there is **no evidence** that **humanity's existence** is at stake. However, climate change is existential to an alarming proportion of **Earth's species**—with up to half facing extinction. We can learn much from the history of the human condition under previous climate eras. Paleoclimate data reveal that **climatic fluctuations** markedly affected human evolution and perhaps eliminated some human populations up to continental scale a million years ago. **Overall**, however, primitive humans **proved resilient** under a variety of **harsh climatic conditions**. In fact, the collapse of the **Atlantic meridional overturning** circulation current—arguably the **biggest climate risk** in the news today— previously occurred about **14,500 years ago.** This is not to understate the threat that human-caused climate change presents, but simply to put it in perspective. There are scenarios of climate "**tail events"** that could **accelerate** climatic disruption and induce massive economic, social and ecological damages. Yet there is **no** scenario in which humanity would **not be able to provide** the **bulk** of its **basic needs,** especially with **further**

technological advances. Distinguishing the circumstances of existential climate risk is not just semantically important—it is crucial for better civil society dialogue, policy analysis and decisions. Importantly, policies to mitigate climate change only improve society if their benefits exceed their costs. An **existential threat** to humanity warrants **virtually any intervention** to reduce the risk. For example, if a civilization-destroying **asteroid** were hurtling toward Earth, any price tag to neutralize the threat would be worth it. Climate change is **often mischaracterized** in this way, as it was by President Joe Biden earlier this year. Some cultural analogies even use the asteroid metaphor literally, as in the movie Don't Look Up. Such discourse encourages **policy interventions** irrespective of their **cost** and **ignores** the value of adaptation. A variety of interventions like fossil fuel bans and green subsidies now impose costs that exceed their climate benefits, whereas market-based policies would reduce emissions at costs below benefits. **Economical policies** that **improve adaptation** in vulnerable areas like Florida must be **prioritized** in order to minimize human suffering.

No Energy Security Impact

Energy independence is meaningless but resilient.

Robert **Rapier 24**. Senior Contributor, Forbes. "U.S. Energy Independence Set New Record In 2023." https://www.forbes.com/sites/rrapier/2024/07/01/us-energy-independence-set-new-record-in-2023/

There are **two ways** to think about **energy independence**. One definition is that we don't import any energy. That would be true energy independence. Call this the **Zero Imports Definition**.

I don't find this definition very useful, due to the **globalized nature** of **energy markets**. The U.S. imports some energy to convert it into **products for export**. We began importing crude oil in the U.S. before 1950, and we have imported it every year since.

Under this definition, the U.S. hasn't been energy independent in **at least 75 years**. This definition highlights how interdependent global energy supplies are, emphasizing that this sort of **energy independence** is neither necessary nor **economically desirable**.

Thus, the notion, "President Trump made us energy independent", is not true under the Zero Imports Definition. During President Trump's term, the U.S. imported an average of 9.3 million barrels per day (bpd) of crude oil and finished products. By the Zero Imports Definition, Statement 1 above holds: We weren't energy independent under Trump or Biden.

Definition 2: Energy Surplus

The Energy Surplus Definition is **more useful** in my view. That defines energy independence as producing **more energy** than we consume. Based on that definition, even if we import some energy, the fact that we produce more than enough to satisfy our needs would mean the U.S. is energy independent.

The Energy Surplus Definition is what Trump is using when he said we became energy independent while he was in office. If we consider this definition, in 2019 the U.S. had an energy surplus for the first time since at least the 1940s. This can be seen in the following graphic when the production line barely exceeds the consumption line for the first time in 2019.

Net U.S. energy imports hit a record high in 2005, but since then have **steadily declined** due to the surge of oil and gas production released by the shale boom. In 2019, net U.S. energy imports became net exports, and that is the measure by which many — including Donald Trump — declared energy independence.

However, we didn't lose this status under Joe Biden. To the contrary, U.S. oil and gas production **continued to grow**, as shown in the next graphic. In 2022 the **net energy surplus** reached 5.94 quadrillion BTUs (quads), which was the highest level in **at least 70 years**.

I covered this development a year ago in U.S. Energy Independence Soars To Highest Level In Over 70 Years. But last week the EIA updated the numbers to include 2023. (They also revised 2022 down to 5.83 quads, which was still higher than any excess under Trump).

The net energy surplus in 2023 grew to **7.80 quads** — the **highest number on record**. In 2019, that number had been only 0.61 quads of net energy surplus. Thus, Statement 2 above is correct. If you are using energy surplus as a measure of energy independence, there have now been three **consecutive annual surpluses** that exceeded those under Donald Trump.

Conclusions

In summary, the debate over U.S. energy independence is often muddled by **differing definitions** and **political rhetoric**. True energy independence, characterized by zero energy imports, **is neither practical** nor reflective of the **interconnected nature** of global energy markets.

Instead, a **more pragmatic** definition — producing more energy than consumed domestically — offers a **clearer perspective**. Under this measure, the U.S. has not only achieved but also **expanded** its energy independence since 2019, with growing surpluses under both the Trump and Biden administrations.

The **consistent growth** in net energy production, particularly driven by advancements in **oil and gas extraction technologies**, underscores the nation's **robust energy sector**. As we move forward, it's crucial to continue fostering policies that support a secure and resilient energy future for the United States.

Energy independence is worse.

Scott **Lincicome 22**. Vice president of general economics, Herbert A. Stiefel Center for Trade Policy Studies. “Actually, America Isn’t ‘Energy Independent.’ (And That’s a Good Thing.)” https://www.cato.org/commentary/actually-america-isnt-energy-independent-thats-good-thing

This rather disappointing conclusion might lead some to suggest that the **U**nited **S**tates would have been better off if we limited trade (imports and exports) and embraced isolationism instead. But, even leaving aside that prices in isolated energy markets (for example, the United States’ natural gas market in the early 2010s before we had substantial LNG export capacity online) still generally track global prices, there is **plenty of evidence** that “**energy autarky**” would make things **worse**, not better for U.S. producers, consumers, and **broader national interests**.

First, economic isolation would exacerbate **domestic economic shocks**. We covered this generally just last week, but the U.S. energy market provides a **real-world lesson** every time a **major hurricane** hits the Gulf of Mexico (where a lot of U.S. energy production is located). Then, domestic petroleum supplies taken offline by storm-related shutdowns are **rapidly replaced** by imports, leaving the U.S. market **generally stable overall**. (See, for example, Hurricane Ida in 2021 and the role financial traders play in this “**market calming**” process.)

Second, isolation can **actually discourage** domestic production. For starters, refiners benefit from **unfettered access** to **cheap feedstocks** from around the world — feedstocks that often are supplied (in optimal form, at least) by **only foreign producers**. Limit that access, and these companies decrease production or pass on their **higher costs** to American consumers.

AT: Add-Ons

AT: Oil Spills

No risk of oil spills. Empirics and safety measures.

IER 20. "Offshore Oil Drilling Safer Now Due to Industry Actions". https://www.instituteforenergyresearch.org/fossil-fuels/gas-and-oil/offshore-oil-drilling-safer-now-due-to-industry-actions/, April 23rd, 2020

A **new** federal regulatory agency was created in 2011—the Bureau of Safety and Environmental Enforcement (BSEE). The agency issued the Well Control Rule in 2016—a complex collection of regulations **designed** to **prevent future blowouts**, providing oil drillers detailedF **requirements** to **safely drill** an offshore well. The Trump administration modified the rule in 2019 to be more attuned to the different characteristics of the industry.

According to the agency's current director, compared to the past six years, the agency increased the number of **inspections** by 26 percent, increased the number of inspections per facility by 86 percent, and increased the numbers of inspectors by 12 percent.

Offshore oil production in the U.S. Gulf of Mexico has been **increasing** since 2013 when it hit its lowest level of production after the Deep Water Horizon accident. In 2019, offshore oil production totaled almost 2 million barrels per day, increasing by 50 percent since 2013. In 2019, the Federal offshore Gulf of Mexico produced 15 percent of total U.S. oil production.

In the past decade, there has not been another **major offshore oil spill** in the United States like the Deepwater Horizon event. In fact, the two companies standing by to cap a well blowout have never even deployed their billions of dollars' worth of equipment for anything other than drills. That shows that the **safety measures** undertaken by the industry are **working** to **prevent another blowout**. The offshore Gulf of Mexico is an important source of U.S. oil, supplying 15 percent of the nation's oil—an important part of our national energy security.

AT: Trade Routes

Icebreakers can't protect Arctic trade routes.

Paul **Avey 19**. Assistant professor of political science at Virginia Tech. "The Icebreaker Gap Doesn't Mean America is Losing in the Arctic." War on the Rocks. 11-28-2019. https://warontherocks.com/2019/11/the-icebreaker-gap-doesnt-mean-america-is-losing-in-the-arctic/

The Consequences of an Icebreaker Gap

Thankfully for Washington, the consequences of this **icebreaker gap** for U.S. defense are often **misunderstood** or **overstated**. First, many of the specific military challenges that China or Russia might pose in the Arctic are independent of icebreakers and best dealt with in other ways. These include denying the United States access to the region, missile strikes against the homeland, the ability to move forces from the homeland, and demonstrating U.S. strength against challenges.

It is not clear how Russia or China would **leverage icebreakers** to exclude the United **States from the region**, or how the United States would utilize icebreakers to **overcome** such **attempts**. Take the concern of Russia denying access along the **Northern Sea Route** (setting aside the limited trans-Arctic shipping to date and modest future projections). The Russian ability to do this stems primarily from their growing missile, air, and surveillance **capabilities** deployed **within their own territory**. As Mathieu Boulègue observes, the Russian Northern Fleet will likely be able to perform some sea denial missions "at a limited operational tempo." Yet "the majority of its assets are not Arctic-specific, operating beyond the region and in other strategic directions." Increasing the numbers of **U.S. icebreakers** would not **overcome** the

Russian shore-based area-denial challenge. In the event of a crisis, naval surface vessels operating behind slow-moving icebreakers would be, Andreas Kuersten notes, “sitting ducks for aerial, undersea, and shore-based enemy forces.”

Trade doesn’t solve war.

Stephen **Brooks 24**. Professor of Government, Dartmouth College; Guest Professor, Stockholm University. “The Trade Truce?” https://www.foreignaffairs.com/world/trade-truce-stephen-brooks

There is a good reason for such confusion: on close inspection, the relationship between global economics and global stability turns out to be extremely multifaceted. Although there have been notable individual studies supporting the **optimistic view** that commerce promotes peace, they are just that — **individual studies**. A **systematic examination** of **all the empirical research** on commerce and conflict shows that the connection is **far more complex**.

Consider trade. In a forthcoming book, I have identified 57 **empirical studies** published since 2000 that examined the influence of trade on war and peace. Just 16 of the studies supported the **optimistic perspective** that trade **universally promotes** peace. One found that it promotes conflict, and nine found no effect. The remaining 31 concluded that trade has a mixed effect on the likelihood of war — sometimes preventing it, sometimes promoting it.

These mixed-effect findings would be useful if they yielded consistent, clear insights regarding the circumstances that lead to peace. But instead, the list that emerges from this scholarship is long, unwieldy, and **sometimes contradictory**. Recent studies, for example, have found that trade leads to peace only when it occurs among democracies, among rich states, among states that are members of the World Trade Organization, among states that mostly trade products from different industries, among states that mostly trade products from the same industries, among states that are members of common regional trade pacts, among states that trade with one another at very high levels, among states that trade with one another to a roughly equal extent, and among states that have low levels of protectionism. Small wonder, then, that policymakers have struggled to craft peace-enhancing trade agendas. The relationship between trade and conflict has **so many asterisks** that it **simply cannot** be **boiled down** into anything pithy for officials, students, or anyone else to follow.

The effect of **international finance** is even murkier. Many analysts have argued that **international capital** flows prevent war. The New York Times columnist Thomas Friedman, for example, once maintained that international investors will “not fund a country’s regional war” and will “actually punish a country for fighting a war with its neighbors by withdrawing the only significant source of growth capital in the world today.” But the literature does not show that investors **consistently flee** states that are at war. Moreover, of the four studies that **looked directly** at how flows of capital influence the likelihood of conflict, **only one** found a **stabilizing effect**. Two concluded there was no relationship, and one found that greater foreign ownership of government debt increased the likelihood of conflict.