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NUUK AND CRANNY: LOOKING AT THE ARCTIC AND GREENLAND'S GEOSTRATEGIC IMPORTANCE TO U.S. INTERESTS

HEARING

BEFORE THE

COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION UNITED STATES SENATE

ONE HUNDRED NINETEENTH CONGRESS

FIRST SESSION

FEBRUARY 12, 2025

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SENATE COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION

ONE HUNDRED NINETEENTH CONGRESS

FIRST SESSION

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NUUK AND CRANNY: LOOKING AT THE ARCTIC AND GREENLAND'S GEOSTRATEGIC IMPORTANCE TO U.S. INTERESTS

WEDNESDAY, FEBRUARY 12, 2025

U.S. SENATE,
COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION,
Washington, DC.

The Committee met, pursuant to notice, at 10:05 a.m., in room SR–253, Russell Senate Office Building, Hon. Ted Cruz, Chairman of the Committee, presiding.

Present: Senators Cruz [presiding], Thune, Wicker, Fischer, Moran, Sullivan, Blackburn, Young, Budd, Schmitt, Curtis, Moreno, Sheehy, Capito, Lummis, Cantwell, Klobuchar, Schatz, Markey, Peters, Baldwin, Duckworth, Rosen, Luján, Hickenlooper, Fetterman, Kim, and Blunt Rochester.

OPENING STATEMENT OF HON. TED CRUZ, U.S. SENATOR FROM TEXAS

The CHAIRMAN. Good morning. The Senate Committee on Commerce, Science, and Transportation will come to order.

It is fitting this Wednesday morning, as we convene a hearing on Greenland, that we have snow on the ground and ice surrounding us.

Today, we are here to talk about something that just a few years ago was treated as far-fetched, but has long been worth serious consideration, the potential of the United States acquiring Greenland. Back in 2019, President Trump raised this issue, the idea of purchasing Greenland, and at the time, it was dismissed by some as outlandish. But given shifting global dynamics, the geopolitical importance of Greenland makes this conversation one we can no longer ignore.

It is a topic of interest to members on both sides of the aisle. Indeed, the idea for this hearing was one the Ranking Member suggested earlier this year. Greenland has never been some remote island; it holds immense strategic and economic importance. Its location and proximity to critical transatlantic trade routes places it at the center of several global debates.

The growing influence of China and Russia in the Arctic region, where Russia has long maintained military assets, and China has invested heavily with a clear strategic eye, is a direct challenge to the United States and our allies. This deserves serious consideration and response.

Greenland sits directly on the shortest flight path for intercontinental ballistic missiles traveling from Russia or the Middle East to the United States, making its positioning critical to our security. We have maintained a military presence in Greenland since World War II, particularly at Pituffik Space Base, which serves as the northernmost U.S. Military installation and provides critical missile warning and space surveillance.

The Base, along with its deep-water port and airfield, is an integral part of our national security infrastructure. Also key to our operational presence and influence in the Arctic is a healthy number of polar icebreakers.

The U.S. built its last heavy icebreaker nearly five decades ago. Meanwhile, China has four, and Russia has over 40, whose warships increasingly appear near Alaska. The only operational United States heavy icebreaker, the POLAR STAR is 20 years beyond its service life. This is simply unacceptable.

President Trump has highlighted the urgent need for a new fleet, and as Chairman, I am committed to ending Russian and Chinese icebreaker dominance. Executing on this quickly—not waiting for years and years on piecemeal annual appropriations, it is vital for our national security, the economic productivity of Alaska and the Arctic, and our national shipbuilding capacity in American shipyards like Keppel AmFELS and Bollinger.

But it is not just about defense. Greenland sits atop vast reserves of rare earth elements, materials critical for everything from technology to national defense. These elements are vital in the production of smartphones, military equipment, medical technologies, and much, much more. If the U.S. were to gain access to Greenland's resources, it could significantly reduce our dependence on foreign suppliers, particularly China, which currently operates a virtual monopoly on the rare earth market.

Now, some may argue that the U.S. purchasing territory is out of the question, but it is not unusual for us to do so. Indeed, much of the history of our Nation was formed by acquiring territory. In 1803, President Thomas Jefferson negotiated the Louisiana Purchase with Napoleon, spending $15 million to purchase 828,000 square miles of land, land that ultimately became part of 14 states, many of which are represented on this committee today.

From the Louisiana Purchase, we got portions of Arkansas, Iowa, Missouri, Oklahoma, Nebraska, Minnesota, Louisiana, New Mexico, the great state of Texas, North Dakota, South Dakota, Wyoming, Montana, and Colorado. Without the Louisiana Purchase, the United States would be a very, very different place than it is today.

And then in 1867, the United States purchased Alaska from Russia, spending $7.2 million for what became our 49th state, and what ultimately gave this committee Senator Dan Sullivan. And indeed, purchasing territory from Denmark is not unusual. The United States purchased the Virgin Islands from the Danish Crown in 1917 to secure a strategic military position in the Caribbean, especially to protect the newly opened Panama Canal, and safe time maritime routes from Germany at war with Western powers.

The acquisition of Greenland is not about military force; it is about diplomacy and shared interests, the same way we acquired the territories that make us the Nation we are. And let us not for-

get, friends and allies can have tough conversations. The U.S. and Denmark have a strong relationship, and discussions about Greenland's future do not have to be adversarial.

If Greenland's future were to include joining the United States that would almost surely require the approval of the Greenlandic people, likely through a public referendum. This would be a mutual decision, and it is one worth discussing. For Greenlanders, there would be many benefits to becoming an American territory, including American citizenship, including billions of dollars of new American investment in Greenland that would raise the standard of living of the 50,000 Greenlanders there today.

I look forward to hearing the testimony from our witnesses about the national security and economic implications of acquiring Greenland, and about the opportunities and challenges we face.

And with that, I recognize the Ranking Member for her opening statement.

STATEMENT OF HON. MARIA CANTWELL,
U.S. SENATOR FROM WASHINGTON

Senator CANTWELL. Thank you, Mr. Chairman. Thank you for holding this important hearing on the Arctic and Greenland, America's economy, and national security.

The United States is an Arctic Nation. My colleagues, Senator Sullivan and Senator Murkowski, say that early and often. Senator Murkowski and I took a trip to the Arctic and Greenland in 2019 with several of our colleagues, and she has been a strong voice calling for a more robust American leadership in the High North. My state has longstanding ties to the Arctic. When you talk about 125 years ago in the Klondike Gold Rush and how everything sent to Alaska came through Puget Sound, the 200 vessels home ported in Seattle that are part of a multi-billion dollar fishing industry in Alaska.

There is a good reason that the Magnus and Stevenson Act that is in place to protect U.S. fishermen, is named after two senators who served as Chairman of this committee.

During the Cold War, America recognized that we had a vital economic and national security interest in the Arctic, now as climate change opens up new sea routes at the top of the world we must do so again. New shipping channels could shorten shipping times between Europe and Asia by two weeks or more, tourism, developing infrastructure, could drive new economic opportunities in remote communities and our Arctic allies could help replace China as the beginning of a new critical mineral supply chain for semiconductors, batteries, defense technologies.

However, as the ice melts we also face growing competition from our international competitors and adversaries. Russia and China are both increasing their military presence in the Arctic. I am sure we will hear about that today. Just last year they conducted a joint military exercise in the Far East and Arctic the reality is they want to be able to control the sea lanes, block freedom of navigation of our commercial, and shipping, and our military.

They want to be able to tap into and sabotage undersea cables and they want to move their stealth submarines and launch hypersonic missiles undetected. Russia is also engaging in illegal

fishing in Alaskan waters, and operating a shadow dark fleet to evade oil sanctions. And following Russia's invasion of Ukraine it became impossible to reach consensus on the Arctic Council.

That is why I believe, Mr. Chairman, in partnership with Canada, and Greenland, and NATO, the U.S. must renew and recommit to an Arctic strategy that solidifies America's leadership in the Arctic. Instead of starting a new trade war America must reinvigorate and expand cooperation with our allies, including Canada and other Nordic countries. We should be pushing to expand NATO's mission in the High North, with Finland and Sweden joining the Alliance, seven of the eight Arctic nations are now NATO members.

Our good model is how NATO recently launched its Baltic Century Operation where allies work together to monitor and promote early warnings of threats from foreign adversaries and protect shared subsea infrastructure.

I encourage that, and I have encouraged that in the recent weeks. NATO's Secretary, General Rutte, has called for a more proactive NATO engagement in the region to strengthen our collective defenses.

The reality is the Arctic is too vast to police alone, it will take time and investment by both the U.S., and our like-minded allies to meet those threats from Russia and China. Russia has already more than 40 icebreakers. I am so glad to hear the Chairman's commitment to icebreakers, as I am sure Senator Wicker is too, the place where many of these ice breakers are built.

While the U.S. Coast Guard only has two, and the Navy has zero. Thanks to the bipartisan support of this committee the Coast Guard will soon operate a third icebreaker, but additional investments are desperately needed, the Chairman mentioned this, to make even this one additional ship operational, Congress has authorized six more icebreakers, but that is still only a fraction of what is required. So I commend President Trump for saying that quote, "We are going to order about 40 Coast Guard icebreakers." We will need those icebreakers. In fact I, 20 years ago, brought then Commandant Thad Allen to meet with several of our colleagues who were blocking these icebreakers.

The future of the U.S. leadership, commerce, and security in the Arctic will require investments in these Coast Guard and military capabilities. We need shoreside infrastructure, including icebreaker homeports, new MH–60 helicopters, more C–130s, and P–8s in the region, and other Navy and air assets.

That is the brawn, but we also need the brains to win the High North. So I hope this committee can work together to explain why massive NSF layoffs and budget short cuts—budget cuts, because I believe they are shortsighted. For example, the University of Washington had a $400,000 study on how glacier breakups off the Coast of Greenland contributed to coastal flooding, something I think we would all be interested in.

This seems particularly shortsighted when we need to understand Greenland better than ever before. In World War II, it served as an essential refueling for military aircraft flying between North America and Europe, cryolite mined in Greenland was used to make U.S. fighters and bombers, and during cold war—during the

Cold War Greenland served as a home to the U.S. early warning network against Soviet missiles.

Once we had 10 military bases in the world's largest island, today only the space base remains. The good news is if we stop talking about buying Greenland and instead work quickly to reestablish U.S. interests there have been, I think since 1951, many update agreements between Greenland and the United States, the one most recently 2018 I think during the Trump—during the first Trump administration.

These agreements are in place that authorized dual-use investments, new port infrastructure, fiber optic cable, radar, and power plants. Over time, Greenland can be a rich source for critical minerals, but there are still high barriers to that development, something I am sure we will hear about at today's hearing, but we can also support the expansion of tourism and infrastructure with airports, roads, and hotels.

And I am sure as our witness from the Wilson Center, Dr. Pincus, will point out today, Greenland has a tremendous untapped hydropower potential. Someday Greenland could become home to data centers to give us the edge in the race for AI, and I plan to introduce legislation that would authorize the Department of Energy to provide feasibility studies on the development of Greenland's hydropower potential.

I also believe that we should direct the EXIM Bank, and other agencies to provide support for more us infrastructure investments in Arctic Nations like Greenland.

And as I said at the last hearing, the United States needs to do more to improve our strategic investments to counter our adversaries. I believe cooperation is the best interest of the United States, and the Arctic is too vast to just police alone.

Hopefully, these coalitions and collective defenses can help expedite U.S. interests there, and support scientific research and national security.

So I look forward to hearing from our witnesses, and continuing to make sure that America, maybe this Greenland incident, Mr. Chairman, will elevate this discussion that Senator Murkowski, Senator Sullivan, myself, have been trying to get so many people to realize we are an Arctic Nation, we have interests there, and we need to continue to move forward.

Thank you, Mr. Chairman.

The CHAIRMAN. Thank you, Senator Cantwell. We now have four expert witnesses before this committee.

The first witness is Alexander Gray, Senior Fellow in National Security Affairs at the American Foreign Policy Council. Mr. Gray served as the Chief of Staff to President Trump's National Security Council from 2019 to 2021 and helped form the administration's positions on elevating the U.S.-Greenland relationship.

Our second witness is Mr. Anthony Marchese, Chairman of the Texas Minerals Resource Corporation, a public company focused on rare earth production, developing one of the biggest deposits of rare earth elements in the United States. He has over a decade of experience in the economics of mineral exploration.

Our third witness is Dr. Jennifer Mercer, Section Head for the National Science Foundation's Arctic Sciences Section. She has

more than 10 years of experience in Greenland and more in Antarctica.

And our final witness will be Dr. Rebecca Pincus, who is the Director of the Wilson Center Polar Institute. She has focused her research on Arctic security and geopolitics.

Mr. Gray, we will start with you. You are recognized for your testimony.

STATEMENT OF ALEXANDER B. GRAY,
SENIOR FELLOW, AMERICAN FOREIGN POLICY COUNCIL

Mr. GRAY. Thank you very much, Mr. Chairman, Ranking Member Cantwell, and Members of the Committee. I appreciate the opportunity to appear before you today on an incredibly important topic.

My name is Alex Gray. I am currently a Senior Fellow at the American Foreign Policy Council. During President Trump's first term, I served as Deputy Assistant to the President, and Chief of Staff of the White House National Security Council. Earlier, I had served at the NSC as Director for Oceania and Indo-Pacific Security, in which capacity I spent a fair amount of time working on China's relationship in the Polar Regions.

My comments today will focus on the strategic and military importance of Greenland to the United States. Beginning in 2019, and continuing to today, President Trump has brought critical public attention to the question of Greenland's strategic significance in the Western Hemisphere and to America's national security. But it is critical to acknowledge that, while this topic has only recently gained widespread public attention, Greenland has long been a focal point for U.S. strategists looking to safeguard the periphery of our hemisphere.

Before reviewing the history of U.S. interest in Greenland's security and the threats that adversary influence or control of Greenland can pose to the United States, I want to make a general point about the ongoing dialogue concerning potential U.S. acquisition of Greenland.

First, I do strongly support President Trump's stated effort to bring Greenland closer to the United States. As I will mention in this testimony, the administration has several excellent options to do just that.

Second, and I think this is an important point that has been overlooked, the current debate has unfortunately become centered on the Kingdom of Denmark rather than on the people of Greenland themselves. Denmark is a key ally of the United States, both bilaterally and through NATO. Danish servicemen have fought and died alongside their American friends for decades, in World War II, Korea, Iraq, and Afghanistan.

This debate, though, must move beyond U.S.-Danish relations because that is simply ancillary to the larger choice facing the United States. Washington and Copenhagen are going to continue to be close friends regardless of the ultimate status of Greenland.

Put simply, and as embodied in Greenland's own Foreign Security Defense Policy Strategy that was put out last year, the ultimate goal of Nuuk is to obtain independence from Denmark. When this will happen is subject to debate, including in Greenland and

Denmark itself, but for U.S. purposes, it is vital that leaders in Washington take seriously what the Greenlanders themselves are telling us, and what the last several decades of increasing Greenlandic self-governance and autonomy demonstrate.

Members of the Committee, the question facing American policymakers comes down to the following, in my view: When Greenland inevitably obtains independence from Denmark, as their leaders again tell us that they will, who is going to greet them on the other side? Will it be Russia and China, with their history of predatory behavior in small developing states and their unwillingness to respect such state sovereignty? Or will it be the United States, with our commitment to sovereignty, the rule of law, respect for the environment, and for the rights and heritage of indigenous people?

Now is the time to begin laying the groundwork for what arrangements can be put into place once Greenlandic independence is imminent.

History tells us how critical this is. And I preview in my testimony, going back to the 1860s, just how much the United States has focused on Greenland as a potential strategic threat if it is occupied or controlled by an adversary power.

I would just highlight a couple of things for these purposes. The U.S. actually occupied Greenland during World War II, because it was so essential that we keep the Nazis from occupying it and being able to base U-boats from there, or potentially to launch bombers against the East Coast of the United States from Greenland.

The United States has attempted to purchase Greenland at least four times, depending on how you count, starting in 1867, and as recently as 1955. Administrations of both parties, Harry Truman, Franklin Roosevelt, Dwight Eisenhower, all seriously considered bringing Greenland closer to the United States because the strategic logic is so clear.

The Island has 27,000 miles of coastline. At its shortest point, it is about 1,100 miles of flying time to the United States. Over the past several decades, foreign vessels have repeatedly arrived in Greenlandic waters without proper authorization, or in violation of NATO protocols. In one instance, a Russian submarine actually showed up in Greenlandic waters and was discovered by accident.

Unfortunately, our friends in Copenhagen have not devoted the defense resources necessary to ensure that Greenland, and the coastline, and the airspace is protected the way they should be. As during the Cold War, the Greenland-Iceland-UK Gap remains an area of considerable strategic concern for the United States as an area for submarine passage going to the East Coast of the United States.

Finally, the United States has significant interest in the Space Base at Pituffik which, obviously, remains one of only two U.S. Arctic facilities that—one of only two U.S. Military bases in the Arctic at that altitude that would serve strategic space interests, and there is no redundancy if we were to lose one of them.

China and Russia have demonstrated their interest in finding weak spots in the Arctic in recent years, dramatically increasing their capabilities. China has preposterously called itself a "near-Arctic power". It has launched a Polar Silk Road initiative with the

intention to do in the Arctic what it has long done in Africa, Southeast Asia, and the Pacific, undermine the sovereignty of developing states at the expense of regional and global security.

Finally, I would just mention a couple of things on how the United States could best bring Greenland closer to the United States. We have a couple of options. One, we could make Greenland a territory, an insular area. We have 14 insular areas in the United States: Guam, American Samoa, U.S. Virgin Islands, to name a few. That is certainly an option. They all have various levels of self-government. They have various levels—depending on Congress' intent, they have various levels of day-to-day autonomy.

Alternatively, the United States could offer a Compact of Free Association to Greenland, similar to what we have with the Marshall Islands, Micronesia, and Palau.

This is, in my view, an excellent option whereby sovereignty by Greenland would be maintained. At the same time, the United States would have a defense obligation and defense access to Greenland that would ensure our strategic interests in the island are upheld. This would grant us also the right to deny military access to an adversary power who sought to use Greenland for its own purposes.

While both these options present opportunities and challenges, the point I want to make is this, Mr. Chairman, Ranking Member, the United States is running out of time to develop a coherent strategic response to an independent Greenland. The security stakes are too high to allow Greenland to obtain independence without a plan in place for the U.S. to ensure our core strategic interests are assured.

As stated above, excellent options do exist and can be implemented, given appropriate attention, focus, and will from the Administration and Congress.

[The prepared statement of Mr. Gray follows:]

PREPARED STATEMENT OF ALEXANDER B. GRAY, SENIOR FELLOW, AMERICAN FOREIGN POLICY COUNCIL

Chairman Cruz, Ranking Member Cantwell, and Members of the Committee, thank you for the opportunity to appear before you today on this important topic. My name is Alex Gray, and I am currently a Senior Fellow at the American Foreign Policy Council in Washington.

During President Trump's first term in office, I served as Deputy Assistant to the President and Chief of Staff of the White House National Security Council (NSC). Earlier, I had served as the first-ever Director for Oceania & Indo-Pacific Security at the NSC.

My comments today will focus on the strategic and military importance of Greenland to the United States. Beginning in 2018 and continuing to today, President Trump has brought critical public attention to the question of Greenland's strategic significance in the Western Hemisphere and to American national security. But it is critical to acknowledge that while this topic has only recently gained widespread public attention, Greenland has long been a focal point for U.S. strategists looking to safeguard the periphery of the Hemisphere.

Before reviewing the history of U.S. interest in Greenland's security and the threats that adversary influence or control of Greenland can pose to the U.S., I would like to make a general point about the ongoing dialogue concerning potential American acquisition of Greenland. First, I strongly support President Trump's stated effort to bring Greenland closer to the United States. As I will preview in this testimony, the Administration has several excellent options to do just that.

Second, the current debate has unfortunately become centered on the Kingdom of Denmark, rather than on the people of Greenland themselves. Denmark is a key ally of the United States, both bilaterally and through NATO. Danish servicemen

have fought and died alongside their American friends for decades, in World War II, Korea, Iraq, Afghanistan, and elsewhere. This debate must move beyond U.S.-Danish relations, because that is simply ancillary to the larger choice facing the United States. Washington and Copenhagen will continue a warm relationship regardless of the ultimate status of Greenland.

Put simply, and as embodied in Greenland's own "Foreign, Security, and Defense Policy: 2024–2033", the ultimate goal of Nuuk is to obtain independence from Denmark. When this will happen is subject to debate, including in Greenland and Denmark, but for American purposes it is vital that leaders in Washington take seriously what the Greenlanders are themselves telling us, and what the last several decades of increasing Greenlandic self-governance and autonomy demonstrate.

Mr. Chairman, Ranking Member Cantwell, Members of the Committee, the question facing American policymakers comes down to the following: when Greenland inevitably obtains independence from Denmark, as their leaders tell us they will, who will be there to greet them on the other side? Will it be Russia and China, with their history of predatory behavior in small, developing states and unwillingness to respect such states' sovereignty? Or will it be the United States, with our commitment to sovereignty, the rule of law, respect for the environment, and for the rights and heritage of indigenous peoples? Now is the time to begin laying the groundwork for what arrangements can be put into place once Greenlandic independence is imminent.

History tells us just how critical this work is. At least since Secretary of State William Seward in 1867, American strategists of various political and ideological persuasions have seen Greenland as a key component of the holistic defense of the U.S. homeland, North America, and the Hemisphere more broadly from potential adversaries. At a little over 1,100 miles from the East Coast at its closest point and controlling vital sea routes between the U.S. and Europe, Greenland has always presented potential adversaries a tempting target for power projection into North America.

One of the rare, conscious American exceptions to the Monroe Doctrine of the last two centuries was the Wilson Administration's acquiescence to Denmark's extension of political and economic control over the whole of Greenland, in exchange for the purchase of the Danish West Indies (now the U.S. Virgin Islands) during World War I. This decision was later regretted by numerous U.S. strategists, including the visionary Army Air Corps General Billy Mitchell, who saw the potential threat of adversary air bases on Greenland as early as the 1920s.

By World War II, when Denmark was occupied by Nazi Germany, the U.S. was faced with a possible German occupation of Greenland. The U.S. in turn occupied Greenland for the duration of the war, establishing a precedent of American military access to the island that continues today. The Truman Administration, in 1946, and the Eisenhower Administration, in 1955, put forward proposals for the acquisition of Greenland. While neither came to fruition, they illustrate the bipartisan understanding during the Cold War of the strategic necessity of the world's largest island. It has only been in the post-Cold War decades, and America's period of distraction in the Middle East and South Asia, that core, hemispheric interests like Greenland have been allowed to escape attention in Washington.

Greenland poses a number of potential security challenges for the United States, should it fall under the control or influence of an adversary power. The island's 27,000 miles of coastline are often relatively unmonitored, and Denmark has consistently failed to provide the military resources necessary to ensure surveillance of them. Over the past several decades, foreign vessels have repeatedly arrived in Greenlandic waters without proper authorization or in violation of NATO protocols-or in the case of a Russian submarine, they were only detected by chance.

As during the Cold War, the Greenland-Iceland-UK (GIUK) Gap remains an area of considerable strategic concern for the United States, serving as a principal passage for Russian (formerly Soviet) submarines to near the East Coast of the United States. Control of Greenland and its approaches is essential for the United States to fully cover the Gap, a motivating factor for the U.S. occupation of Greenland in the 1940s and for the continuing military presence there during the Cold War. Increased Russian submarine activity in the Arctic and closer to the U.S. in recent years has only heightened these longstanding concerns.

Greenland also has numerous air and space vulnerabilities for the United States. Its airspace, and visibility into it, is essential for broader North American security. Given Denmark's lack of investment in the military resources needed to uphold security near Greenland, the island's airspace is a subject of some concern, particularly given Russia's growing bomber presence in the Arctic.

And as is well known, the U.S. maintains Pituffik Space Base on Greenland. Given the increasing use of polar or sun-synchronous orbit for satellites in critical

fields like communications and weather, and the concomitant need for ground tracking stations in the polar regions, maintaining such a site is essential. Unfortunately, it is one of only two such Arctic facilities available to the U.S. In the event of an unexpected event, or even if Greenlandic independence resulted in a loss of U.S. access to Pituffik, the lack of redundancy in such capabilities would be immensely harmful to U.S. interests.

China and Russia have demonstrated their interest in finding weak spots in the Arctic in recent years, while dramatically increasing their capabilities. Both countries are investing heavily in icebreakers, including nuclear-powered ones. China's preposterous declaration that it is a "near-Arctic power", along with the launch of its "Polar Silk Road" initiative, bespeak an intention to do in the Arctic what it has long practiced in Africa, Southeast Asia, and the Pacific: undermine the sovereignty of developing states at the expense of regional and global security.

Indeed, from the Faroe Islands (another Danish possession) to Norwegian-administered Svalbard, Chinese and Russian malign activity in the High North is only growing and offering indications of the challenge facing the U.S. in securing our interests in an increasingly volatile Arctic.

Preventing a post-independence Greenland from going the way of other vulnerable, developing states who have succumbed to Chinese (or Russian) malign activity must be a top national security priority for the Administration and Congress. To that end, there are two options that would most effectively protect a post-independence Greenland from outside malign interference and uphold U.S. interests.

First, Greenland could agree to join the United States as one of our currently fourteen "insular areas," which include jurisdictions as diverse as American Samoa, Puerto Rico, the U.S. Virgin Islands, and Guam. Each are administered and organized differently, per Congress, with differing levels of local control. I have argued that such an approach, which would formally link Greenland to the United States in perpetuity and solve permanently the security dilemma we are discussing, is the ideal solution. It would also offer numerous economic and other benefits to the Greenlanders, recognizing that the details of such a territory would be subject to detailed and difficult negotiations.

Second, the United States could offer an independent Greenland (or, for the time being, indicate our intent to offer a to-be-independent Greenland) a Compact of Free Association, or COFA. This concept is currently in place with the Marshall Islands, the Federated States of Micronesia, and Palau. As the Committee is aware, COFA signatory states are sovereign, independent countries; they are United Nations members with their own foreign policies and systems of governmental organization. What they share is a legal commitment by the United States to their defense; the grant of permanent military access to the United States; and the right of the United States to deny such access to any other power. Additionally, the U.S. provides the COFA signatory states certain financial support and development assistance.

While both options present challenges and opportunities, the point I seek to make is this: the United States is running out of time to develop a coherent strategic response to an independent Greenland. The security stakes are simply too high to allow Greenland to obtain independence without a plan in place for the U.S. to ensure our core strategic interests are assured. Fortunately, as stated above, such options exist and can be implemented given appropriate attention, focus, and will from the Administration and Congress.

Mr. Chairman, Ranking Member Cantwell, I thank you for the opportunity to appear before you today and I look forward to your questions.

The CHAIRMAN. Thank you. Mr. Gray.

Mr. Marchese.

STATEMENT OF ANTHONY MARCHESE, CHAIRMAN, TEXAS MINERAL RESOURCES

Mr. MARCHESE. Thank you very much, Chairman Cruz, Ranking Member Cantwell, and honorable Members of the Committee. Thank you for the opportunity to appear before you today to address Greenland's mineral riches, and more specifically—excuse me—the potential development of a critical minerals industry.

I am Anthony Marchese, and for 12 years I have been Chairman of Texas Mineral Resources, a publicly traded company that, along with a partner, is developing the Round Top Project, a world-class

critical minerals deposit just outside El Paso, in Senator Cruz's home state of Texas.

Round Top's diverse array of critical minerals, when combined with my 30 years of experience in the capital markets, I believe, gives me a unique perspective on the discussion of Greenland's riches.

As the world's largest island, roughly one and a half times the size of Alaska, Greenland presents a mining conundrum. On one hand, it is a treasure chest of not only critical minerals, but base metals, precious metals, and industrial minerals.

A map prepared by the Government of Greenland illustrates the obvious. Greenland's entire coastline holds what is indisputably one of the world's greatest collections of minerals in one jurisdiction. Throw a dart at any portion of the coastline, and you will undoubtedly hit a potential world-class target.

Conversely, the sheer topography of Greenland presents a potential—or presents significant challenges: One-mile-thick ice in its interior, covering 85 percent of the country, winter temperatures averaging 16 degrees Fahrenheit; and thick sea ice, which potentially create clogged shipping lanes.

While geological maps of Greenland present a vast array of critical mineral deposits along its coast, the presence of such deposits is only a starting point for exploration. Critical minerals vary in value significantly.

Rare earth minerals, such as cerium and lanthanum, although considered critical by the U.S. Geological Survey because they are part of the rare earth minerals basket, are not as valuable as neodymium and praseodymium, which are essential for magnets and batteries. Mineral characterization is essential in order to, "separate the wheat from the chaff", to focus on economically profitable deposits.

Such characterization requires significant amounts of exploratory drilling. Drilling provides answers to questions such as: What minerals do we have? What are the estimates of the quantities we have? And what are the grades of the minerals we have? Drilling is expensive, and such costs in Greenland are magnified.

Once mineral characterization costs are addressed, capital and operating costs of mining are encapsulated in a feasibility study. After receiving the necessary approvals and permits, the feasibility study requires drilling data, metallurgical data, processing cost data, environmental data, and finally, the downfall of many projects, commodity prices or accommodating commodity prices.

Mining in Greenland dates back to the 1950s. In fact, Greenland was at one time the world's largest producer of cryolite, a mineral used in aluminum production. Outside of cryolite, serious mining in Greenland commenced in the 1990s. Unfortunately, there has not been significant critical mineral mining in Greenland.

In 2021, the Government effectively ended a promising rare earth project because uranium would be mined as a mineral by-product. As a result, Greenland banned uranium mining due to local indigenous opposition. Interestingly, a study sponsored by McGill University, in Canada, several years ago found that over 85 percent of the population surveyed favored mining, with the exception of radioactive materials.

Without characterization, we do not know if future mineral deposits are accompanied by uranium, thereby potentially limiting development unless there are policy changes.

An acquisition of Greenland by the United States could take many forms. I believe Alex just mentioned those. There needs to be a determination as to which regulatory authorities, if any, would govern mining projects. In the United States, the Bureau of Land Management and the U.S. Forestry Service govern mining regulations on Federal lands, while states like Alaska also give serious consideration to the desires of the indigenous population.

At the present time, Greenland's 56,000 inhabitants are predominantly Inuits, an indigenous population which has a strong voice in environmental policy, along with the Governments of Greenland and Denmark. Regulatory authorities are critical to an examination of the economic incentives for mining. Characterization of mineral deposits is time-consuming and expensive, tantamount to venture capital investing.

The USGS could provide government funding for such characterization to lessen the exploration risk for private industry. In this regard, it is imperative to remember that capital costs for Greenland projects are highly variable. Frigid winters create many restrictions and significant hurdles for timely project development.

Lack of infrastructure, such as roads, fuel, electricity, and housing, exacerbate capital costs. Workforce needs would require the import of foreign labor, given that skilled mining labor is minimal in Greenland. Metallurgical expertise necessary to process mineral material would present further challenges as such expertise is generally available, primarily, in Asia.

Greenland's mining challenges would likely require the U.S. Government to provide significant financial assistance in order to attract private capital, with funding needs required in both upstream and downstream development.

Shortsightedly, current U.S. policy provides funding solely for downstream development, which has been a severe impediment to our own domestic production.

In conclusion, mining in Greenland can likely attract capital by providing significant financial incentives, while simultaneously aligning local politics and environmental regulations in an effort to create a supportive investment in climate for private industry.

Thank you for your attention and interest. And I am pleased to answer any questions you may have.

[The prepared statement of Mr. Marchese follows:]

PREPARED STATEMENT OF ANTHONY MARCHESE, CHAIRMAN, TEXAS MINERAL RESOURCES CORP.

Chairman Cruz, Ranking Member Cantwell, and Honorable Members of the Committee:

Thank you for the opportunity to appear before you today to address Greenland's mineral riches and more specifically the potential development of a critical minerals industry.

I am Anthony Marchese and for twelve years, have been Chairman of Texas Mineral Resources, a publicly traded company that, along with a partner, is developing the Round Top Project, a world-class critical minerals deposit just outside El Paso in Senator Cruz's home state of Texas. Round Top's diverse array of critical minerals, when combined with my thirty years' experience in the capital markets, gives me a unique perspective on the discussion of Greenland's riches.

As the world's largest island, roughly 1.5 times the size of Alaska, Greenland presents a mining conundrum. On one hand, it is a treasure chest of not only critical minerals but base metals, precious metals, and industrial minerals. A map prepared by the government of Greenland illustrates the obvious. Greenland's entire coastline holds what is indisputably one of the world's greatest collection of minerals in one jurisdiction. Throw a dart at any portion of the coastline and you will undoubtedly hit a potential world-class target.

Conversely, the sheer topography of Greenland presents potential significant challenges: one-mile-thick ice in its interior covering 85 percent of the country, winter temperatures averaging 16ºF and thick sea ice which create clogged shipping lanes.

While geological maps of Greenland present a vast array of critical mineral deposits along its coast, the presence of such deposits is only a starting point for exploration. Critical minerals vary in value. Rare earth minerals such as cerium and lanthanum, although considered critical by the United States Geological Survey (USGS), are not as valuable as neodymium and praseodymium, which are essential for magnets and batteries. Mineral characterization is essential in order to "separate the wheat from the chaff" to focus on economically profitable deposits. Such characterization requires significant amounts of exploratory drilling. Drilling provides answers to questions such as: "what minerals do we have?" "what are the estimates of the quantities we have?" and "what are the grades of the minerals we have?" Drilling is expensive and such costs in Greenland are magnified.

Once mineral characterization costs are addressed, capital and operating costs of mining are encapsulated in a feasibility study. After receiving the necessary approvals and permits, the feasibility study requires drilling data, metallurgical data, processing cost data, environmental data and finally, the downfall of many projects: commodity prices.

Mining in Greenland dates back to the 1850s. In fact, Greenland was at one time the world's largest producer of cryolite, a mineral used in aluminum production. Outside of cryolite, serious mining in Greenland commenced in the 1990s. Unfortunately, there has not been significant critical mineral mining in Greenland. In 2021, the government effectively ended a promising rare earth project because uranium would be mined as a mineral byproduct. As a result, Greenland banned uranium mining due to local Indigenous opposition.

Interestingly, a study sponsored by McGill University several years ago found that over 85 percent of the population surveyed favored mining with the exception of radioactive minerals. Without characterization, we do not know if future mineral deposits are accompanied by uranium, thereby potentially limiting development unless there are policy changes.

An acquisition of Greenland by the United States could take many forms. There needs to be a determination as to which regulatory authorities, if any, would govern mining projects. In the United States, the Bureau of Land Management (BLM) and the U.S. Forestry Service govern mining regulations on Federal lands while states like Alaska also give serious consideration to the desires of the Indigenous population. At the present time, Greenland's 56,000 inhabitants are predominantly Inuits, an Indigenous population which has a strong voice in environmental policy alongside the government of Greenland and Denmark.

Regulatory authorities are critical to an examination of the economic incentives for mining. Characterization of mineral deposits is time consuming and expensive, tantamount to venture capital investing. The USGS could provide government funding for such characterization, to lessen the exploration risk for private industry. In this regard it is imperative to remember that capital costs for Greenland projects are highly variable. Frigid winters create many restrictions, significant hurdles for timely project development. Lack of infrastructure such as roads, fuel, electricity, and housing exacerbate capital costs. Workforce needs would require the import of foreign labor given that skilled mining labor is minimal in Greenland. Metallurgical expertise necessary to process mining material would present further challenges, as such expertise is available primarily in Asia.

Greenland's mining challenges would likely require the U.S. government to provide significant financial assistance in order to attract private capital, with funding needs required in both upstream and downstream development.

Shortsightedly, current U.S. policy provides funding solely for downstream development, which has been a severe impediment to our own domestic production. In conclusion, mining in Greenland can likely attract capital by providing significant financial incentives while simultaneously aligning local politics and environmental regulations in an effort to create a supportive investment climate for private industry.

Thank you for your attention and interest. I am pleased to address any questions you might have.

The CHAIRMAN. Thank you, Mr. Marchese.
Dr. Mercer.

STATEMENT OF DR. JENNIFER MERCER, SECTION HEAD, SECTION FOR ARCTIC SCIENCES, OFFICE OF POLAR PROGRAMS, DIRECTORATE FOR GEOSCIENCES, U.S. NATIONAL SCIENCE FOUNDATION

Dr. MERCER. Good morning, Chairman Cruz, Ranking Member Cantwell, and Members of the Committee.

My name is Dr. Jennifer Mercer, and I am the Head of Arctic Sciences in the Office of Polar Programs at the U.S. National Science Foundation.

Thank you for the opportunity to participate in today's hearing to share the important research and collaboration that NSF is facilitating in Greenland. NSF has an important mission of supporting the U.S. research enterprise and fostering U.S. STEM talent. NSF support of research facilities also establishes a U.S. presence in the Arctic, demonstrates our capabilities as a nation, and builds goodwill with other nations.

This research is important in the Polar Regions where, as you know, Russia and China are increasingly seeking to extend their reach. I oversee both scientific research conducted in Greenland and the research infrastructure that enables research funded by NSF, other Federal agencies, and by international partners that advances U.S. national interests.

I was born and raised in South Dakota and completed my undergraduate studies there. After earning my Ph.D. in New Hampshire, I was a researcher at the University of Wyoming before joining the Federal Government, first in the Department of Defense, and then at NSF.

The first time I deployed to Greenland was 15 years ago, bringing with me a decade of experience as a researcher in Antarctica, and I am excited to share with the Committee why Greenland is so important to the U.S. science and engineering research enterprise.

The Polar Regions have a long history with both U.S. scientific research and defense operations. Greenland was strategic during World War II and the Cold War for the U.S. and its allies. It was the site of Camp Century, where the U.S. Army established an operational base under the ice. Efforts like this taught us a lot about ice sheets and snow mechanics, and how to operate in these extreme environments, knowledge and methods that we still use today in both the Arctic and Antarctica.

NSF has an established relationship with the government of Greenland, which has authority over research there. All of the research activities that NSF supports in Greenland are conducted consistent with Greenland law and regulations. NSF collaborates across the U.S. Government with the Department of State and several Department of Defense services. NSF funds the research capabilities as well as research projects on the U.S. Coast Guard's Icebreaker HEALEY, which visited Greenland last summer.

NSF facilitates research logistics in the Arctic on a cost-reimbursable basis for NASA, NOAA, and other agencies that are supporting activities there. U.S. Scientific Research spans from the marine environment to the coastal villages and towns, to the top of the Greenland ice sheet. Today, about 80 percent of Greenland is covered in ice, and at its thickest points, it is nearly 2 miles deep. It is a massive feature that is important for understanding variability in the earth's land ice and is an ideal location to study atmospheric circulation.

Research in the coastal waters is important for understanding marine ecosystems, ocean circulation, and the submarine environments, which support fishing and vessel navigation. NSF awards support upwards of 300 people at 15 to 20 research locations throughout Greenland each year.

NSF's main operational locations are the village of Kangerlussuaq, and the United States' Pituffik Space Base on the West Coast, and Summit Station and Raven Camp on the Greenland ice sheet. Raven Camp serves as a training site for the New York Air National Guard's 109th Airlift Wing that operates the ski-equipped LC–130 aircraft fleet, the only fleet of its kind capable of landing large loads of cargo and fuel on ski ways.

The U.S. is the only country with this capability. The LC–130 is the backbone of transportation within Antarctica and on the Greenland ice sheet. Summit Station is the only high-altitude, high-latitude inland year-round research station in the Arctic.

Summit sits at a physical elevation of over 10,000 feet. It was established in 1989 as an ice drilling camp; year-round operations began in 1997, focusing on continuous atmospheric sampling and measurements. NSF is currently in the process of designing new station infrastructure for Summit, and this will serve as a hallmark of U.S. scientific research in the Arctic.

NSF has approximately 75 active awards to U.S. institutions for research in, around, and about Greenland. The Arctic contains distinct physical features that allow for unique research opportunities with practical impact, and these are just some highlights of the important scientific study happening in Greenland, where the U.S. is a leader and a collaborator in research.

Thank you for the opportunity to testify today. And I look forward to your questions.

[The prepared statement of Dr. Mercer follows:]

PREPARED STATEMENT OF DR. JENNIFER MERCER, SECTION HEAD, SECTION FOR ARCTIC SCIENCES, OFFICE OF POLAR PROGRAMS, DIRECTORATE FOR GEOSCIENCES, U.S. NATIONAL SCIENCE FOUNDATION

Good morning, Chairman Cruz, Ranking Member Cantwell, and members of the Committee. My name is Dr. Jennifer Mercer, and I am the Section Head for the Arctic Sciences Section in the Office of Polar Programs at the U.S. National Science Foundation. Thank you for the opportunity to participate in today's hearing to share the important research and collaboration the U.S. National Science Foundation, known as NSF, is facilitating in Greenland.

Established by the National Science Foundation Act of 1950 (P.L. 81–507), NSF is charged with the mission "to promote the progress of science; to advance the national health, prosperity, and welfare; to secure the national defense; and for other purposes." NSF is unique in carrying out its mission by supporting research across all fields of Science, Technology, Engineering, and Mathematics, STEM, through grants to colleges, universities and other research organizations across the U.S. To augment the U.S. research enterprise, NSF has established research infrastructure

that serves American interests in several strategic locations around the globe, such as ground-based telescopes and research vessels that transit the oceans, that enable discoveries and make the U.S. a global leader in STEM. Most notable for today's discussion are NSF's investments in research infrastructure and operations in the polar regions, including in Greenland. NSF's support of polar research facilities establishes a U.S. presence in the Arctic, facilitates research related to U.S. critical interests, demonstrates our capabilities as a nation, and builds good will with other nations. This research is important in the polar regions where, as you know, Russia and China are increasingly seeking to extend their reach.

In my role, I oversee both scientific research conducted in Greenland, and the research infrastructure that enables research funded by NSF, other Federal agencies, and by international partners that advances U.S. national interests.

Let me tell you a bit more about myself. I was born and raised in South Dakota and completed my undergraduate studies there. After earning my PhD at Dartmouth College in New Hampshire, I was a researcher at the University of Wyoming before joining the Federal government, first in the Department of Defense and then at NSF. The first time I deployed to Greenland was 15 years ago, bringing with me a decade of experience as a researcher in Antarctica. When I told my parents that I was going to Greenland, my dad, an Army veteran who served over 50 years ago, said "Greenland? The Army used to threaten to send us there for disciplinary action. Why would you want to go to Greenland?" Keep in mind that was a long time ago. I'm excited to share with the Committee today why Greenland is so important to the U.S. science and engineering research enterprise. When I stepped off the C–130 my first time in Greenland I was reminded of the vast open spaces of my home state. The towns and villages of Greenland are similar to the rural U.S. with small towns and wide open spaces, where people have both a sense of independence and of looking out for one another. The cold temperatures and biting winds might also be reminiscent of winter in some of our home states.

The polar regions have a long history with both U.S. scientific research and defense operations occurring there simultaneously and together. Greenland was strategic during WWII for the U.S. and its allies. It was again important during the Cold War. It was the site of Camp Century, where the U.S. Army established an operational base under the ice—right around the time my dad was serving. Efforts like this, novel as they were at the time, taught us as a nation a lot about ice sheet and snow mechanics, and how to operate in these extreme environments, knowledge and methods that we still use today for research and operations in both the Arctic and in Antarctica.

NSF has an established relationship with the Government of Greenland, which has authority over research there. All of the research activities that NSF supports in Greenland are conducted consistent with Greenland law and regulations, including obtaining any necessary permits from the Government of Greenland.

To make scientific research both successful and efficient in Greenland and throughout the Arctic, we at NSF collaborate across the U.S. government with the Department of State, several Department of Defense services such as Space Force, Air Force, Air National Guard, and Army research labs including the Cold Regions Research and Engineering Laboratory and the Natick Soldier Systems Center. NSF funds the research capabilities, as well as research projects, on the U.S. Coast Guard's Icebreaker HEALY which just last summer visited Greenland. NSF facilitates research logistics in the Arctic, on a cost reimbursable basis, for NASA, NOAA, and other agencies that are supporting activities there.

U.S. scientific research spans from the marine environment to the coastal villages and towns, to the top of the Greenland Ice Sheet. Today, about 80 percent of Greenland is covered in ice, and at its thickest points it is nearly 2 miles deep. The Greenland Ice Sheet is a massive feature that is important for understanding variability in the earth's land ice, and the ice sheet is an ideal location to study atmospheric circulation. Research in the coastal waters of Greenland is important for understanding marine ecosystems, ocean circulation, and the submarine environments which support fishing and vessel navigation.

NSF awards support research at 15–20 locations throughout Greenland each year with upwards of 300 people per year to carry out the work. NSF's main operational locations are the village of Kangerlussuaq, the United States' Pituffik Space Base, formerly Thule Air Base, on the west coast, and Summit Station and Raven Camp on the Greenland Ice Sheet.

Until recently, Kangerlussuaq was the only airport capable of accepting large intercontinental airplanes. In 2024, Greenland opened their new international airport in Nuuk and plans to extend capabilities at two other airports.

Pituffik Space Base is operated by the 821st Space Base Group with a mission to enable force protection, space superiority, and scientific research in the Arctic re-

gion for our Nation and allies. It is due to the long history of NSF and the Air Force working together in Greenland that supporting scientific research is part of the base mission.

NSF also operates Raven Camp on the Greenland Ice Sheet. This seasonal camp serves as a backup landing site on the ice sheet and as a training site for the NY Air National Guard's 109th Airlift Wing that operates the ski-equipped LC–130 aircraft fleet—the only fleet of its kind, capable of landing large loads of cargo and fuel on snow runways known as skiways. The U.S. is the only country with this capability. The LC–130 is the backbone of transportation within Antarctica and on the Greenland Ice Sheet.

Summit Station, where NSF owns the infrastructure and operates with permits from the Government of Greenland, is the only high altitude, high latitude, inland year-round research station in the Arctic. Summit sits at a physical elevation of 10,530 feet above sea level and at times the pressure altitude can reach 13,000 feet—meaning that the air pressure makes it feel higher than it is—13,000 feet is similar to the top of Grand Teton in Wyoming. Temperatures range from -88 degrees F in the winter to just below a freezing 32 F in the summer. Summit Station was established initially in 1989 as an ice drilling camp and in 1993, after drilling around the clock during the summer months, scientists retrieved what was the deepest ice core in the world at that time. Year-round operations began at the station in 1997 focusing on continuous atmospheric sampling and measurements.

People and cargo are delivered to the station via the LC–130 aircraft fleet. Summer population tends to hover around 35 people and in winter a small staff of 5 people maintain the station, its systems, and the scientific research. Clean water for drinking, cooking, and bathing is produced by melting snow. Food is kept frozen by storage in underground snow trenches.

NSF is currently in the process of designing new station infrastructure for Summit so that we can replace approximately 30 outdated buildings with five elevated buildings and two surface level buildings which will allow for more efficient and flexible operations. The wind and snowfall at Summit Station constantly threaten to bury buildings through drifting. This new infrastructure will be easier to maintain over time and will serve as a hallmark of U.S. scientific research in the Arctic.

Greenland's capital City of Nuuk has a strong research community of its own. It has several small research organizations such as Asiaq, which is similar in concept, but not scale, to the U.S. geological survey. It also has the larger Greenland Institute of Natural Resources which houses departments for the study of fish, bird and mammals, mineral resources, and climate. Greenland also has a national Research Council which funds research and develops research priorities for the country, including a national strategy for research in Greenland.

The U.S.-Denmark-Greenland Joint Committee was established in 2004 to broaden and deepen cooperation among the United States, the Kingdom of Denmark, and Greenland. The Joint Committee is led by Department of State, and NSF has long funded the U.S. component of the Joint Science Education program which was originally established by the Joint Committee. This program provides field science experiences for students from Greenland, the U.S., and Denmark each summer.

Over a decade later, the Joint Committee created an Embassy Science Fellowship opportunity through our U.S. Embassy in Denmark. In 2017, I had the privilege to serve as that Embassy Science Fellow. But instead of being stationed at our embassy, I was embedded with the Government of Greenland in Nuuk, with the ministry that oversees research in Greenland. This was an extraordinary opportunity to see and learn first-hand about Greenland's priorities for scientific research and STEM education, and to build relationships with its leaders.

Currently, NSF has approximately 75 active grant awards to U.S. institutions for research in, around, and about Greenland. Several of those awards are to institutions in your home states.

For example, the University of Texas at Austin is leading a study of ecological dynamics in a fjord that is connected to a glacial outlet. This has implications for the fishing industry which is rapidly developing in the Arctic. This work also contributes to U.S. understanding of emerging dynamics that may influence global food security.

Another example is a long-standing project at Summit Station called ICECAPS which refers to the integrated Characterization of Energy, Clouds, Atmospheric state, and Precipitation at the top of the Greenland Ice Sheet. This project is led by Washington State University with collaborators from institutions in Colorado, New Hampshire, Wisconsin, and Idaho as well as in the UK. It is aimed at understanding atmospheric dynamics over the Greenland Ice Sheet and has implications for daily weather forecasting in the northern hemisphere.

University of Kansas is developing sensor technology to add to drones to improve mapping of glacial activity in Greenland, while the Universities of Montana and Wyoming are working together to develop a novel ice drilling capability to understand how meltwater affects ice movement along the margin of the Greenland Ice Sheet.

And Penn State is working with institutions in Delaware, Nebraska, Wisconsin, Kansas, Illinois, and a few other states to establish the first ultra-high energy neutrino observatory in the northern sky.

These are just some highlights of the important scientific study happening in Greenland where the U.S. is a leader and a collaborator in research. The Arctic, including Greenland, contains distinct physical features that allow for unique research opportunities with practical impact. The ice sheets and sea ice affect ocean currents and our weather patterns in the northern hemisphere. The extreme cold, and long dark winters, prompt physiological adaptations in mammals that may have applications to the human body, and the harsh conditions allow us to evaluate infrastructure performance and advance materials science. In addition, the high altitude of Summit Station offers a unique and important platform in the high Arctic for the study of astrophysics.

In closing, I am honored and grateful for the opportunity to talk about NSF's important work in Greenland with you. Thank you.

The CHAIRMAN. Thank you, Dr. Mercer.

Dr. Pincus.

STATEMENT OF DR. REBECCA PINCUS, DIRECTOR, POLAR INSTITUTE, WILSON CENTER

Dr. PINCUS. Thank you for convening this hearing on the Arctic and Greenland. I am honored to appear before you today as the Director of the Wilson Center's Polar Institute.

In keeping with the nonpartisan, policy-focused work of the Wilson Center, I offer the following comments on U.S. strategic interests in the Arctic and Greenland significance. My bottom line up front is that the Arctic region, which has important and enduring strategic significance to the United States, has taken on an added measure of global importance due to its natural resources, emerging shipping lanes, and relevance to space issues.

Greenland's importance is best understood in this broader Arctic context. The Arctic holds significant natural resources, including minerals, hydrocarbons, and fish. Emerging shipping lanes across the Arctic, including the Northern Sea Route across Russia's Coast and the Northwest Passage, are drawing increasing interest as ice coverage declines.

The Arctic is also important to the space domain since polar and near-polar orbits provide unique and valuable satellite views. Russia has core national security and economic interests in the Arctic. It is a region of top importance to Russia. China also has interests in the Arctic, including natural resources and emerging shipping lanes. China has no territory in the Arctic, and the region is outside core PRC interests, however, the complex and emerging China-Russia relationship plays out in part in the Arctic, and this makes China an important and influential regional actor.

The U.S. established itself as the dominant polar power through significant effort and investment at the peak of the Cold War. Today, the effort that went into building U.S. leadership in the poles is at risk. The investments made in the 1970s are rusting away, and the U.S. faces a new and more complex global competition. Without a fresh wave of investment and attention, the U.S. will face severe limitations on its presence in the poles and could soon lose its dominant position.

These weaknesses are apparent, and it is not surprising that U.S. competitors are leveraging the symbolic value of polar capabilities and operations to apply pressure on us. For example, China has leveraged its world-leading shipbuilding capacity to build a small fleet of research icebreakers, in contrast to the degraded condition of the U.S. polar icebreaker fleet.

The POLAR STAR and the HEALY were great ships in their day, but the STAR is now 52 and the HEALY is 28. The U.S.'s ten ski-equipped LC–130s, which Dr. Mercer has already discussed, were built in the early 1970s, and they are all now 50 years old. These unique capabilities are approaching the end of their operational lives. Losing them would directly risk U.S. presence in the polar regions.

When it comes to Greenland specifically, I would underscore that Greenland has enduring national security significance to the United States by virtue of its geographical position, and that Greenland's mineral resources have the potential to affect U.S. economic security.

I would note that Greenland has other economic strengths that also merit consideration, and I will offer a couple of comments on each of those points.

Greenland's long-standing importance to U.S. homeland defense and securing northern approaches is heightened by today's increasing activity by U.S. competitors, and the prospect of increasing accessibility throughout the Arctic. The Pituffik Space Base is a critical forward location to U.S. missile defense. Greenland provides the westernmost location for monitoring Russia's naval activities in the Arctic and North Atlantic.

Other NATO allies are critical to this effort, and the U.S. enjoys strong defense relationships in and adjacent to the region. Denmark recently announced a $2 billion package of defense investments for Greenland, with a second tranche of investment to be announced this summer. Greenland has a rich endowment of minerals, as Mr. Marchese has discussed. Most are as yet undeveloped due to several significant complicating factors.

The foremost challenge is the harsh climate and lack of infrastructure, which significantly raise development costs. Greenland's enormous energy potential is often overlooked. The island has virtually unlimited hydropower around the ice sheet. Its hydro potential is very high quality and offers the potential to collocate energy-intensive industrial facilities in the Icelandic model.

The cold climate in Greenland would make data centers an obvious choice, although this would require a fast fiber connection to the United States, possibly via the planned Far North Fiber Project between Japan and Ireland, or through Quintilian's planned expansion. A fiber connection to Greenland would enhance regional security through a dual-use benefit to communications capabilities, and it would tie Greenland closer to the United States.

Tourism is another significant area for growth. Starting this summer, United Airlines will offer direct flights, just over 4 hours long, from Newark to Nuuk, with tourism arrivals expected to double in the face of significant limitations on hotel availability and other support infrastructure, there is both a tremendous economic

opportunity as well as a need for strategic investment and development planning.

Many of the challenges and opportunities we see in Greenland are echoed across the North American Arctic, including in Alaska and the Canadian Arctic.

I welcome the Committee's attention to this problem set and its strategic implications. The Polar Institute stands ready to support Congress' efforts through our research and analysis.

Thank you so much.

[The prepared statement of Dr. Pincus follows:]

PREPARED STATEMENT OF DR. REBECCA PINCUS, DIRECTOR, POLAR INSTITUTE, WILSON CENTER

Introduction

Chairman Cruz, Ranking Member Cantwell, and distinguished members of the Committee, thank you for convening this hearing on the Arctic and Greenland's geostrategic significance to the U.S. I am Dr. Rebecca Pincus and I am honored to appear before you today as the Director of the Wilson Center's Polar Institute to discuss these issues.

Prior to directing the Polar Institute, I served on the faculty of the U.S. Naval War College, in the Center for Naval Warfare Studies. From 2020–2022, I was detailed from the Naval War College to the Office of the Secretary of Defense for Policy, first to the Deputy Assistant Secretary of Defense for Strategy and Force Development office and later the newly established Deputy Assistant Secretary of Defense for Arctic and Global Resilience. Before joining the Naval War College, I served on the faculty of the U.S. Coast Guard Academy, and led research for the Coast Guard's Center for Arctic Study and Policy.

Woodrow Wilson Center's Polar Institute

The Polar Institute was established as a program within the Woodrow Wilson International Center for Scholars in 2017. Since then, it has become a premier forum for discussion and policy analysis of Arctic and Antarctic issues. The Polar Institute studies the central policy issues facing these regions, with an emphasis on foreign policy, economic development, security and defense, and scientific research. Our nonpartisan analysis and findings are communicated to policymakers and other stakeholders.

We do this work within the administrative context of the Wilson Center, which was chartered by Congress in 1968 as the official memorial to President Wilson. The Wilson Center is Congress's only non-partisan policy forum for tackling global issues through independent research and open dialogue to inform actionable ideas for the policy community.

The Arctic and Greenland's Importance to U.S. Interests

In keeping with the nonpartisan, policy-focused work of the Wilson Center, I offer the following comments on U.S. strategic interests in Greenland. By placing Greenland in the context of U.S. national interests and objectives in the Arctic and beyond, I will underscore the significance of Greenland and the Arctic region, and the importance of its consideration by this Committee.

In brief, I offer three major points: first, that Greenland has enduring national security and homeland defense significance to the U.S. by virtue of its geographical position; second, that the disposition of Greenland's mineral resources has the potential to affect U.S. economic security, but that Greenland has other economic strengths; and third, that Greenland's significance is best understood in the context of the Arctic region, which is itself a growing zone for geopolitical competition.

1. Greenland is important to U.S. national security

Greenland, an island roughly three times the size of Texas, straddles the Arctic and North Atlantic Oceans. Its strategic position on the North Atlantic sea lanes of communication (SLOCs) has given it military significance since World War II.[1]

[1] For more information on Greenland in WWII, see "Greenland and the Strategic Advantage of Weather Reporting." Tom Laemlein, *American Rifleman,* 2019. *https://www.americanrifleman.org/content/greenland-and-the-strategic-advantage-of-weather-reporting/*.

The U.S. began building the Thule Air Base in northwest Greenland in 1951: since then, this base has served as a vital node in U.S. nuclear strategy.[2] In its early years, the base was an important location from which aircraft could be launched for both early warning/reconnaissance missions against the Soviet Union, as well as nuclear response. Thule also served as an important forward location for radar defense systems that point northwards, across the Arctic, to provide early warning of incoming missile launches against the U.S. In 2020, Thule Air Base was transferred to the U.S. Space Force, and in 2023 it was renamed Pituffik Space Base in recognition of its historic Inuit name.

Today, Pituffik Space Base is critical to space domain awareness and surveillance, missile defense, and early warning.[3] The base includes a satellite tracking station and a solid-state phased array radar system, as well as a 10,000-foot runway and deepwater port. It could support power projection and forward defense into and around the Arctic if necessary.

Greenland is a critical forward location to U.S. missile defense. While the overall nature of this threat is a function of geography, at present it creates a vulnerability for the U.S. due to new missile threats and a decline in relative U.S. military position. Across the Arctic, the U.S. confronts two serious adversaries with significant abilities to hold the U.S. homeland at risk from land and/or sea-based attacks.

Greenland provides the westernmost location for monitoring Russia's naval activities in the Arctic and North Atlantic, since it sits at one end of the GIUK (Greenland-Iceland-UK) Gap, a strategic corridor.

Greenland's longstanding importance to U.S. homeland defense and securing northern approaches is heightened by today's increasing activity by U.S. competitors, and the prospect of increasing accessibility throughout the Arctic. The U.S. military has a significant position in Alaska, including the world's largest concentration of 5th-generation fighter aircraft and the 11th Airborne. Greenland's location on the eastern side of the Arctic complements Alaska—they are the "10 o'clock and 2 o'clock" of the North American continent—and together, homeland defense and domain awareness from these positions offers critical protection to the U.S. Robust capabilities and shored-up presence on both sides of the continent are important to protect the U.S. from threats across the northern hemisphere, from space to the sea floor. This includes a robust layered missile defense and space-based missile sensor capability.

The U.S. military presence in Greenland is accomplished via the 1951 Defense of Greenland agreement signed by Denmark and the U.S., which was subsequently refined in 2004 with the Igaliku Declaration.[4] U.S. presence is also covered by the NATO Status of Forces Agreement (SOFA).

2. Greenland is an important part of the global competition over minerals

Greenland has a rich endowment of minerals, including rare earths, platinum metals, uranium, and more.[5] Most of these resources are as yet undeveloped due to several significant complicating factors: the foremost challenge is the harsh Greenlandic climate and lack of infrastructure, which significantly raise development costs.

One plausible pathway to Greenland's independence lies through development of its natural resources, revenue from which could replace the current Danish block grant. Since Greenland's minerals do not compete well on the open market, given the extra costs discussed above, this pathway may require some nonmarket intervention.

In addition to minerals and metals, Greenland may have valuable hydrocarbon deposits on and offshore, although thorough mapping is not yet complete.

Greenland's enormous energy potential is often overlooked: the island has virtually unlimited hydropower around the ice sheet.[6] Its hydro potential is very high quality, and offers the potential to co-locate energy-intensive industrial facilities in the Ice-

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[2] For additional background, see "From bilateral to trilateral agreement: the case of Thule Air Base." Maria Ackren, Arctic Yearbook 2019.

[3] "Pituffik Space Base, Greenland." Peterson and Schreiver Space Base, U.S. Space Force. *https://www.petersonschriever.spaceforce.mil/Pituffik-SB-Greenland/*

[4] "Agreement between the United States of America and Denmark Amending and Supplementing the Agreement of April 27, 1951." U.S. Department of State (2004). *Treaties and Other International Acts Series 04–806.*

[5] For more information, see "Review of the critical raw material resource potential in Greenland." Geological Survey of Denmark and Greenland (2023). *https://doi.org/10.22008/gpub/32049.*

[6] For more information, see "Data and Reports" on Greenland Hydropower Resources, Government of Greenland. *https://hydropower.gl/emner/data-and-reports?sc_lang=en.*

landic model. The cold climate in Greenland would make data centers another efficient choice, although this would require a fast-fiber connection to the U.S.

Tourism is another significant area for growth: with direct flight connections to the U.S. beginning in 2025, Greenland is becoming significantly more accessible. Starting this summer, United Airlines will offer direct flights just over 4 hours long from Newark to Nuuk.[7] With tourism arrivals expected to double, in the face of significant limitations on hotel availability and other support infrastructure, there is both a tremendous economic opportunity as well as need for strategic investment and development planning.[8]

In summary, while Greenland's minerals receive the most global attention, its most likely economic development pathway would parallel the Icelandic model, with revenue streams from tourism, energy-intensive industry, and fisheries as primary economic drivers. Iceland does not have a military, relying instead on the NATO alliance, and a similar arrangement could be expected in Greenland.

3. Greenland is a part of geopolitical competition in the Arctic

In addition to a better understanding of Greenland and its significance to the U.S., I welcome this Committee's attention to the growing importance of the Arctic region. The Arctic region is about 5 and a half million square miles, including one of the world's oceans, and includes the territory of 8 sovereign nations, including the U.S. It is home to 4 million people. The U.S. has vital interests in the Arctic region, across all dimensions of national interest: we have lands and waters in the Arctic; we have citizens living there; we have critical national security and defense interests, compelling economic interests, and important interests relating to science.

The Arctic region is of global importance, and therefore is increasingly subject to global competition. The region holds significant natural resources, including minerals, hydrocarbons, and fish. Potential emerging shipping lanes across the Arctic, including the Northern Sea Route across Russia's coast and the Northwest Passage, are drawing increasing interest as ice coverage declines. Russia has enormous security and economic interests in the region. China also has interests in the Arctic.

The Arctic is also important to the space domain. Polar and near-polar orbits provide unique and valuable satellite views.[9] For example, sun-synchronous orbits allow a satellite to pass over the same location at the same time each day, providing valuable imagery. The importance of polar and near-polar orbits can be seen in the number of high-latitude satellite ground stations operated by the U.S., China, Russia, and others in the Arctic. In addition, harsh Arctic conditions are being used to help us prepare for Mars exploration—Canada's Devon Island, lying across Baffin Bay from Greenland, hosts two major Mars-analogue sites, including NASA's Haughton Mars Project.

Put more simply, the Arctic has both intrinsic and strategic economic importance: specific resources with economic value, and also scientific/information value to the space domain. Both polar regions are critical to earth sciences, as well as space exploration. The Arctic and Antarctica hold symbolic value as well: not many states are present, much less powerful, at the very ends of the earth.

The U.S. established itself as the dominant polar power through significant effort and investment at the peak of the Cold War. By asserting itself as the leading presence and superpower in the polar regions, the U.S. deterred the Soviet Union. Large bases and research stations anchored U.S. leadership. Presence and influence were enabled by polar icebreakers, ski-equipped C–130s, and other key platforms and capabilities. In 1970, President Nixon underlined the importance of the U.S. "maintaining an active and influential presence in the Antarctic," in support of scientific, economic, and political objectives.[10] Nixon's actions reflected the clear connection between presence and influence. In the 1970s, investment in polar presence and capabilities was recognized to be a wise use of resources to wage the global war against Communism.

Today, the effort that went into building U.S. leadership in the poles is at risk. The U.S. is at a weak point in the Arctic: investments made in the 1970s are rust-

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[7] See United, "Flights from New York to Greenland." *https://www.united.com/en-us/flights-from-new-york-to-greenland.*

[8] "Air Greenland's CEO on Expansion in a Changing World." *Aviation Week* (2025). *https://aviationweek.com/podcasts/window-seat-podcast/podcast-air-greenlands-ceo-expansion-changing-world.*

[9] "Ever Forward: The Unique Relationship between the Arctic and Space." David Marsh, Polar Institute, Wilson Center (2024). *https://www.wilsoncenter.org/blog-post/ever-forward-unique-relationship-between-arctic-and-space.*

[10] National Security Decision Memo 71: United States Antarctic Policy and Program. (1970). Richard Nixon Presidential Library and Museum. *https://www.nixonlibrary.gov/national-security-decision-memoranda-nsdm.*

ing away, and the U.S. faces a new and more complex global competition. Without a fresh wave of investment, the U.S. will face severe limitations on its presence in the poles, and could soon lose its influence and dominant position.

In particular, the POLAR STAR and HEALY were great ships in their day, but the STAR is now 52 and the HEALY 28. The U.S.'s 10 ski-equipped LC–130s were built in the early 1970s, and are all now 50 years or older. These capabilities are approaching the end of their operational lives.

These weaknesses are apparent, and it is not surprising that U.S. competitors are leveraging the symbolic value of polar capabilities and operations to apply pressure at a U.S. weak point in the region. For example, China has leveraged its world-leading shipbuilding capacity to build a small fleet of research icebreakers, including the XUE LONG 2, the JI DI, and the TAN SOU SAN HAO.[11]

In conclusion, I thank the Chair and Committee for your attention to this important and timely issue set, and welcome your engagement. Greenland and the Arctic are important to a broad array of U.S. national interests. The Polar Institute stands ready to support Congress's efforts through our research and analysis.

The CHAIRMAN. Thank you to each of the witnesses for your very informative testimony.

Senator Sheehy is going to be presiding over the Senate in a few minutes, so he has asked if he can go first. So I am going to yield my time initially to him, and recognize Senator Sheehy.

STATEMENT OF HON. TIM SHEEHY,
U.S. SENATOR FROM MONTANA

Senator SHEEHY. Thank you, Chairman. Thanks to all of you for your testimony, very enlightening.

For Dr. Pincus, a question directed your way, it seems like you have a pretty informed policy view on this. You know, the only constant is change, and right now we are seeing aggressive territorial expansion efforts from Russia, obviously through force, and China is literally building islands to expand its sphere of influence, not just in the South China Sea, but as you correctly pointed out, using every tool at its disposal to grow its influence elsewhere.

I think the discussion we are having here is a commonsense discussion about how we can maneuver ourselves to ensure that extremely important piece of real estate, which at the end of the day is what we are discussing, whether it is data centers, whether it is critical minerals, whether it is shipping lanes, does not fall into the wrong hands.

And from your policy perspective, what is the best approach? And I think then I will move to Mr. Gray as a secondary: What do you think is the best outcome? What is the best approach to achieve what we think the best outcome can be, so that we do not allow Greenland to become a territory of our adversaries in the very near future?

Dr. PINCUS. Thank you so much for that question, sir. I would say that from a policy and analysis perspective, which is my background, the U.S. has a range of policy options in Greenland. The choice among them entails a consideration of priority, risk, and cost, and the President and Congress will make those determinations and set policy.

I do think that a thorough review of various scenarios and contingencies would be a worthwhile exercise to carefully review the

[11] For more, see "China Delivers Arctic-Capable Research Vessel, Expanding Polar Presence." by Mike Schuler and "China Deploys Three Icebreakers to Arctic as U.S. Presence Suffers After 'Healy' Fire." by Malte Humpert, both in *gCaptain,* (2024).

range of possible scenarios for Greenland's futures and evaluate a set of options for the United States, again, along those parameters of priority, risk, and cost.

We have heard that Greenland is in a global context in which we have options that span across the Pacific in terms of different approaches to our relationship with Greenland. So we have both a geographical span to consider here, as well as, I would say, an evolution over time. Greenland has been very important to the United States' missile defense for decades, and so we have an enduring significance there as well.

So I think thinking about sort of geographical span, risk over time, and then those questions of priority, risk, and cost would merit a very thorough review.

I welcome this discussion here today, but I think a more in-depth analysis of various options would give you better grounds for making those determinations. Thank you.

Mr. GRAY. Senator, I agree with you completely that the threat is very real, and the threat of both Russian and Chinese penetration in Greenland, and not just in Greenland, but in the High North more generally, is something we have to be very attuned to. We have seen it not just in Greenland, but in the Faroe Islands, we have seen it in Svalbard, we have seen it all over that High North region.

To me, the number one objective of the United States in Greenland has to be the same that it has been since the 1860s, which is to prevent, deny access, and control to an adversary power who would use that space to threaten our homeland and our hemisphere. To me, the best way to do that, ideally, would be as an insular area of the United States, one of the 15th insular areas that we have.

Alternatively, if that was not feasible for whatever political or other reason, I think the alternative of a Compact of Free Association, whereby critically we would have military access, but I think even more significantly, similar to our Pacific friends in Palau, RMI, and Micronesia, we would have the right of denial, to deny formally and through a legal mechanism the right of a foreign adversary to use that space. I think that would be the ideal American solution.

Senator SHEEHY. What do you think the—that is not going to come for free, so what is that going to cost?

Mr. GRAY. Well, I can tell you, sir, in the instance of Palau, Micronesia, and Marshall Islands it does cost development assistance, it costs—you know, in Palau, we have a trust fund that we fund, that we funded for decades. You know, it is on the order of hundreds of billions of dollars.

But I think, one, it solves a security dilemma that we have had for decades or centuries; and two, you know, Mr. Marchese is much more eloquent on the natural resources side of this, but there are tremendous economic opportunities that I think can offset some of these costs if we do this strategically and thoughtfully. So I think it is a—I think there are ways to offset the cost, in short, Senator.

Senator SHEEHY. Great. Thank you.

The CHAIRMAN. Thank you, Ranking Member Cantwell.

Senator CANTWELL. Thank you, Mr. Chairman. And again, thanks for holding the hearing.

And Dr. Pincus, so Greenland is a NATO ally, correct? We, we have military relationships now that allows us to be there, and we have all these other relationships that we could take advantage of, both on minerals. It is, to me, there is just a cheering section in Congress that wants us to understand the Arctic, and we have been yelling about it, I guess, or cheerleading for icebreakers for a long time because it starts way over on our side of the country.

Before you get to Greenland we are seeing the intimidation, the activities of Russia and China as it relates to our fish, intimidation in our waters, and so for us, it does not start and end in Greenland, it is this issue you and others articulated of a melting ice that gives a Northwest Passage, that gives a whole—a whole new trend of interest.

But when you think about what you mentioned, everything from, you know, space to natural resources, what do you think is the most important thing we could do now to bolster that alliance? Is it a more broadened NATO agreement? Because with this Baltic Century Operation, where they were trying to stop what Russia is doing is it—you know, is it some other capability, right now on this communication issue?

And then, while I am not against the mineral agreement or enhanced mineral agreement, it seems to me that the hydro relationship, given what Mr. Marchese has said about the ice being this challenge. Here, ice is our friend, and ice is creating a ton of hydro, and if you do the sea cable, it seems to me like this is that, that getting a stronger NATO relationship, getting our expansive view of how this fits into the larger Arctic picture and taking advantage of the easy layups, would be things that we should do?

Dr. PINCUS. Thank you for that question, Senator. You know, again, I will go back to my earlier point that the U.S. has a range of policy options. And the first step is to define the problems that we are focused on really carefully because it is hard to talk about answers if you do not know—if we are not all in agreement on what the problem is. But I think——

Senator CANTWELL. I call that the correct environmental assessment.

Dr. PINCUS. But in terms of policy options, you know, I think—you know, the acquisition of Greenland is a really interesting option that deserves very careful scrutiny and weighing. I do think that it is a challenging option. I think there are some practical hurdles that would have to be overcome, and we can have a discussion about what those would be. I do think cost is an issue, but I think there are a range of options that, again, can be weighed against the problem, the risk we face, and our relative prioritization of it.

And so if we put territorial expansion sort of at one end of the spectrum here, and then we can think about what might be smaller scale policy options that would be a less total solution but might be——

Senator CANTWELL. Let me ask you something differently.

Dr. PINCUS. All right.

Senator CANTWELL. If this—we were not discussing Greenland and what the President said, would you be arguing for a larger

NATO relationship, and a larger Arctic agreement between the United States and NATO allies?

Dr. PINCUS. I think the NATO alliance is becoming more active in the Arctic region without that agreement, and NATO is a large alliance that moves fairly slowly. So it has taken some significant steps to be more active in the Arctic in the last few years, and that process has been balanced against the ongoing demands of the war in Ukraine.

Senator CANTWELL. Well, you could say we were slow on ice-breakers too, so, so this is—again, this is this awareness issue of we are trying to get the whole country to understand this challenge.

Dr. PINCUS. I will say that the U.S. and Denmark have a Bilateral Defense Agreement, for the defense of Greenland from 1951, one that did not include Greenland. That agreement was expanded in 2004, the Igaliku Agreement to better include Greenland's voice. But 2004 is 20 years ago, and Greenland has taken many steps toward independence since then.

So a new, perhaps trilateral defense agreement that is responsive to U.S. security concerns, as well as the new political powers that have devolved to the Greenlandic Government, I think is something that in the short term certainly could also deserve some attention.

Senator CANTWELL. Thank you. Thank you, Mr. Chairman.

The CHAIRMAN. Thank you, Senator Cantwell.

Mr. Gray, if the United States were to go forward with attempting to acquire Greenland, it would likely require the active agreement of Denmark, and also the vote of the people of Greenland that this was a mutually beneficial step. Let us focus initially on the first part. From the perspective of Denmark, what are the benefits to Denmark of considering this negotiation?

Mr. GRAY. Well, Senator, I would say Denmark has failed, unfortunately, to provide the type of security that the alliance, that NATO, that we all need in the Greenland region, in the Arctic, for a long time. So having a U.S. commitment to take on some of that security burden would be beneficial to Denmark, based on their behavior to date. I know they have recently increased some defense spending relative to Greenland, that is great, but we have a pattern of decades of neglect. So I would think that would be to their benefit.

Look, I think the larger question here, Senator, is Denmark is not going to have, as a constituent part, Greenland over the long term, and so to their—that Greenlanders have made that clear. So the question is, what is the security architecture that is going to be in place at that ultimate point of independence?

And it is not in Denmark's interest, just as it is not in our interest to have a vacuum that is filled by China and Russia, and that is why having some sort of discussion about what comes next is so critical.

The CHAIRMAN. So if I am understanding your testimony correctly, there are three principal benefits to Denmark of considering selling Greenland's territory to the United States. The first is that their existing defense obligations put significant costs on Denmark, costs that are a real burden to the Government of Denmark and the people of Denmark.

The second, is if the United States were to shoulder the cost of providing that defense, defense of Denmark would also significantly increase the defense—the defense of Greenland, rather, would also significantly increase the defense and security of Denmark, and limiting the role of Russia and China in the Arctic also enters into the defense benefits of Denmark.

But number three, and this is an important point you made, we are seeing a growing independence movement in Greenland. If Denmark were to negotiate today with the Trump Administration to sell the territory of Greenland to the United States, it would presumably be able to negotiate some substantial sum of money. That is how we purchased the Louisiana Purchase. That is how we purchased the Virgin Islands. That is how we purchased Alaska.

If Denmark does nothing and Greenland declares independence, then rather than getting some substantial sum of money, Denmark gets nothing. Is that a fair summary?

Mr. GRAY. I think over the ultimate timeframe, we are talking about, Senator, that is true, because I believe we should take the Greenlanders at their word that they will be an independent country at some point, and ultimately, sir, it is not in Denmark's interest to leave a security vacuum in the High North.

In addition to your point about the costs, they will suffer as much as anyone from having what I think is the 100 percent predictable outcome of China and Russia stepping into that vacuum if we do not have some sort of clear security architecture in place.

The CHAIRMAN. So I think that is very powerful. Let us turn to the benefit—to the Greenlanders. And Mr. Marchese, I think if this were to proceed, it would, in all likelihood, require a referendum of the people of Greenland making a choice: Do you want to become an American? Do you want to join the United States as a territory or in some other legal structure?

And there has been some chatter online about an early public poll that was done that suggested that currently Greenlanders did not want to do that. That does not strike me as terribly probative, given that this is the very beginning of a discussion, and any referendum would be made with the Greenlanders assessing: What do we get for it? What is our benefit? How are our lives better off?

So in your judgment, how would the lives of Greenlanders be better off were they to become part of America?

Mr. MARCHESE. Senator, I mentioned in my testimony that McGill University had done a survey of the population, and they were for mining. So I believe part of it is the recognition that were the United States to come in, more than likely, they would provide some form of financial assistance to allow private companies to come in and mine, and the vast majority, I think they said about 85 percent, of the Inuits wanted mining, with the exception of uranium. That is a separate topic.

The point is, I believe once the Greenlanders recognize that the United States would come in and provide a lot of assistance, that mining jobs would be there, and that is very important for the population. There is just—there just is not that much mining right now, and I think that if there were the prospect of financial assistance to jumpstart the mining industry, I think you would see more Greenlanders interested in becoming part of the United States.

The CHAIRMAN. We see significant discussion. I sat down this past week with the Ambassador from Denmark and with the Ambassador Representative from Greenland, and one of the things discussed is the very significant benefits that come with American citizenship. I think, for example, of Puerto Rico, where the people of Puerto Rico enjoy a considerable upside from their current status as an American territory.

And were Greenland to agree to this acquisition, the Greenlanders would get the invaluable asset of American citizenship, but also would benefit from billions of dollars of additional investment in Greenland to develop those rare earth minerals, the vast resources they have that are not currently being developed.

Tell us, how would the investment increase, and how would that benefit Greenland and America if Greenland's status were to change such that it were part of the United States?

Mr. MARCHESE. Senator, the first step, as I mentioned in my testimony, would be to actually provide—I believe the USGS would be the best forum or the best agency to do this. But with the USGS's assistance, undertake a massive mineral characterization in the country. Well, first of all, that in of itself, it is not a short-term process. That is probably a few years to do that in and of itself would provide jobs for people.

Remember, there are only 56,000 people there, so you do not need that many to have the entire country be happy. So the USGS comes in, provides some assistance to map, in essence, map the area to figure out which deposits are real, which deposits are not real.

Once you do that, then you start getting into convincing companies to put money in, and that provides even more jobs. So I think even before you start putting a shovel in the ground to create a mine, you have, in my opinion, the potential for thousands of new jobs in a mining industry. I mean, at the end of the day, Greenland, in my opinion, can become a—with other obviously environmental oversight—can become a major international producer of all types of minerals. Not to mention, as Senator Cantwell said, a potentially large hydro industry. And that in of itself requires, forget about rare earth minerals, but as an example, the hydro industry would require a tremendous amount of jobs. But remember, the expertise has to be developed also.

The CHAIRMAN. So there are potentially massive economic benefits.

Mr. MARCHESE. I believe massive potential.

The CHAIRMAN. Senator Kim.

STATEMENT OF HON. ANDY KIM,
U.S. SENATOR FROM NEW JERSEY

Senator KIM. Thank you, Mr. Chair.

Mr. Gray, I would like to start with you. You talked about two different ways in which this might proceed about Greenland becoming an insular area or a COFA Agreement. I just want to ask, does that mean it is safe to assume that you do not think the U.S. should consider the use of force or economic coercion to take control over Greenland?

Mr. GRAY. Sir, I do not think the United States should use any sort of coercive behavior toward a NATO ally, meaning Denmark.

Senator KIM. And because this has implications even beyond just Greenland, beyond just our conversations with Denmark, do you think that the U.S. talking about potential use of force, or not taking use of force off the table in places like Greenland and Panama, that that weakens our arguments when we are criticizing or going against Russia and China for their infringements upon sovereignty in Ukraine, and/or maritime boundaries in the Indo-Pacific?

Mr. GRAY. Sir, I think what is critical is that the United States—the comments I think you are referring to, had to do, in my view, with making sure that nothing was off the table in terms of if an adversary were to gain access to key parts of the Western Hemisphere. And I do not think we can take anything off the table to prevent an adversary from gaining control of key choke points.

I think, obviously, in terms of allies and partners, we would never want to use military force or coercive means.

Senator KIM. When it comes to—when it comes to this decision that you are saying, you know, that we benefit from having a COFA, when we would benefit from having, you know, insular partnerships here on this front with insular areas. I guess I wanted to just understand, why does it have to be that route? So for instance, you talked about the Faroe Islands. Iceland is also up in that area. Would you recommend to us that we consider making offers to those places for those same offers of insular areas or COFA?

Mr. GRAY. I would not, sir, mainly because they are not part of the Western Hemisphere. And I think this, if you look at the history of our relationship with Greenland, the history of our strategic concerns with Greenland, it is unique.

And it really is, if you go back and look at the history of the United States in the World War I period, when we were negotiating with Denmark to retain—to purchase the Virgin Islands, one of the things that we did at that same period was we actually waived the Monroe Doctrine, one of the few times we have ever done this, and told the Danes that we had no objection to them gaining additional political control over Greenland, which was not fully established at the time, as part of our larger negotiations over the purchase of the Virgin Islands.

So this is clearly within the framework of the Monroe Doctrine, of hemispheric defense, of kind of traditional U.S. strategic conceptions of the outer perimeter of our hemisphere. I think this is very different from some of the examples you mentioned.

Senator KIM. Well, I think the Faroe Islands and Iceland are closer to the United States than Micronesia, Palau, or other places where you said that we have COFA Agreements. I do not understand the difference.

Mr. GRAY. Well, those, sir, I think are uniquely important because of their strategic location relative to the Indo-Pacific and relative to some of the scenarios that might be important for us in a military contingency. And you know, I am sure, the history of how we acquired those.

Senator KIM. Yes.

Mr. GRAY. And why they continue to be so critical.

Senator KIM. I guess what I am just trying to get across here, and you know, I also had conversations with Greenlanders over the course of the last week, is everything that we are saying here in this room, we are all in agreement that there is strategic value in Greenland, and we should be pushing forward on the icebreakers, and so many other things that we should be doing.

But I feel like we are getting in our own way by having this conversation about acquisition at a time when that is not even needed. I mean, I will be honest with you, the Greenlanders I talked to were insulted that we were talking in this way about their own land, as if they are not even there, as if we can just purchase this and buy this, as if they are just an object.

And that is what they said to me. That it feels like we are saying they are an object that we can just take because we are the richest, most powerful country in the world.

So I just want to push back here, because there is so much that we can be doing without having to own Greenland, so much more scientific partnerships, so much more that we can offer when it comes to minerals and mining. We should just be pushing forward in that, regardless of what happens with a potential referendum going forward, so that if they do get to that place, we are already positioned ourselves as a strong partner.

No doubt more we can do right now, but I just think that this is getting in our own way. And when you look at the polling, 85 percent of Greenlanders say they are opposed to becoming part of the U.S., 46 percent view President Trump's interest as a threat.

If we are trying to solidify our relationship with them, especially in some post-independence position, we are burning those bridges. We are sowing a sense of distrust right now that I think would make it even harder for us to be able to achieve that later. And with that, I will yield back.

Senator MORENO [presiding]. Thank you. Senator Fischer.

STATEMENT OF HON. DEB FISCHER,
U.S. SENATOR FROM NEBRASKA

Senator FISCHER. Thank you. Senator Moreno.

Dr. Pincus, there has been much discussion of late on Greenland, but I think what is underappreciated is something that you were trying to focus on, and that is the importance of Greenland to a whole host of U.S. strategic interests that are there. And obviously, yes, we need to develop a good working relationship, a good partnership with Greenland.

You mentioned the Space Force Base that is in Greenland. It is a critical forward operating location. It is the Department's northernmost installation. It hosts radar systems that are essential, essential to our missile defense.

You know, the comment was made that there could be flight paths of ICBMs over Greenland. Well, that may or may not happen, but what is key there, is though—that no matter where in the Arctic ICBMs are flying, what we have to have is radars to be on Greenland so that not only can they track, but they can also detect any incoming threats.

I would also like to consider the Greenland-Iceland-UK Gap, and Mr. Gray, maybe you would want to add Summit into this discus-

sion as well. As we look at the increased Russian submarine activity there in recent years, and you couple that with the growing Chinese and Russian presence in the Arctic, I think it is hard to understate that gap is importance.

So both of you, do you assess that increasing U.S. presence in the GIUK Gap would be beneficial? I will start with Dr. Pincus, then Mr. Gray, if you would like to add.

Dr. PINCUS. Thank you very much, Senator, for that terrific question. You know, I think it is very helpful to talk in terms of specifics, and in Greenland, we have long had radar installations to give us early warning of incoming ICBMs coming from Eurasia. And in the current era of hypersonics, new missiles, and new missile delivery systems, it is very important that those radars remain in place and that we recapitalize and modernize them to give us as much advanced notice as possible.

So there is a big radar system at Pituffik Base, there is a big airfield, there is a deep-water port, on the east coast of Greenland that is the westernmost point of the GIUK Gap, so it is a key point for monitoring Russian naval activity. And you know, I think we are looking at a set of challenges in the GIUK Gap related to Russian activity, undersea activity that is a real problem set for us.

The gap between Greenland, Iceland, the UK, and also I would add Norway, provides us with some really important points from which to support monitoring and activity. It would be best to talk to the Department of Defense in a classified setting about what specific capabilities and access they may need. But I will say that the 1951 Defense Agreement gives us very wide access to Greenland.

We have never had a problem asking for access and permissions and not getting it. And both Greenland and Denmark have made it clear that they stand ready to have that conversation again. I think the Danish defense investments that have been announced include domain awareness capabilities and presence that will help us. There is certainly more that can be done, but I think being very specific about what the problem is, is helpful in terms of thinking about our appropriate response, and also recognizing that in the event of contingency, fixed installations, whether it is a radar asset or an airfield, they would be taken out with long-range missile strikes.

So you know, I would say that Russia does not have the capability to seize and hold Greenland, nor would there be a strong military argument for it to do so, given that it's most likely response in the event of a contingency would be to strike those assets and then keep moving on.

Senator FISCHER. Which would also make it extremely important that DOD maintains that spectrum use to be able to identify what is coming in, not just for the Homeland, but also for Greenland.

Dr. PINCUS. Absolutely, and I think having a conversation about air defense, and you know, missile defense options we have—we do not have interceptors in Greenland. We do not have interceptors in Canada. We have them in Alaska. So I think there is a conversation to be had about that specific capability.

Senator FISCHER. Yes. Thank you. Mr. Gray, before I get called out, please?

Mr. GRAY. Thank you, Senator. So many of our concerns strategically about Greenland going back to the 1940s have been about the GIUK Gap, and it has been a concern across multiple great power competitors. It is a concern today. To me the question is less—Dr. Pincus made the comment about, you know, militarily, it would probably not be taken out. I am more concerned about a future political arrangement in Greenland that could be influenced or controlled adversely by an adversary power in a way that would prevent us from being able to exercise the type of control or the type of domain awareness over the Gap that we have had in recent years.

That is why I think these proposals that I have mentioned, and others put forward, for what is the long-term political arrangement in connection with Greenland. It is so important, because we have to have the ability to maintain some sort of control and some sort of awareness over that Gap.

Senator FISCHER. Thank you.

Senator MORENO. Senator Blunt Rochester.

STATEMENT OF HON. LISA BLUNT ROCHESTER, U.S. SENATOR FROM DELAWARE

Senator BLUNT ROCHESTER. Thank you for the recognition, Mr. Chair, and Ranking Member Cantwell, and for convening this hearing about our partnership with Greenland.

Greenland is positioned near the next vital strategic region for the United States and our adversaries: the Arctic. As we all have discussed here today, Russia and China know well that the Arctic is important to controlling the flow of trade and global security, and they are increasing their economic and military activities in the region. That is why we must simultaneously strengthen our relationship with Denmark and Greenland while addressing the growing international threats to the region.

Our alliance with Denmark and Greenland is critically important to our shared economic and national security. I would like to focus my questions on our critical mineral supply chains. Greenland's strong natural resources offer economic opportunities for Greenland itself, for the United States, Denmark, and our allies.

As Greenland's own Minister of Business has noted in a January 16th op-ed, Greenland has 39 of the 50 minerals we have classified as critical to national security. This is why supply chain resiliency is one of my top priorities. Ensuring the innovative industries in the U.S., and in the allied nations have the resources they need is critical for the expansion of good-paying jobs for Greenlanders and for a strong economy.

And we really need to make sure that we put a fine point on the fact that we desperately need—we need a national strategy for our supply chains, which is why I am happy to be working, in a bipartisan way, with Senators Cantwell and Blackburn.

Dr. Pincus, how would you say we can strategically leverage and work with Greenland on their abundant critical materials to enhance the resiliency of domestic industries—our domestic industries?

Dr. PINCUS. Thank you, ma'am, for that question. Greenland has abundant minerals. They have been discussed extensively by Mr.

Marchese. I appreciate those facts. There are significant challenges bringing those minerals to market, and there are—as he has also discussed, there are conditions that increase the price. It is a harsh climate, there is very little infrastructure, and so companies operating in a market context are generally going to look elsewhere. And this is amplified by a global context in which mineral prices are volatile, and a mine is a long-term bet.

We are talking a 20-, 30-, 40-, 50-year bet. And under that current set of conditions, where you have to spend a lot of money upfront to develop a mine in Greenland, and you do not know what the prices are going to be in 20 years when your ores spit out, it is hard to justify that. That would require non-market interventions to overcome, whether it is government funding, roads and infrastructure, providing grants, or special investment vehicles to provide capital that is not available in the marketplace.

That problem set exists in Alaska and also in the Canadian Arctic as well. The North American Arctic has abundant natural resources. They are in the United States' backyard. It is very tempting to construct those short supply chains, but the price challenges remain. And I think if we can find solutions to help overcome some of those challenges, our domestic supply lines would be much stronger.

The environmental standards across North America are the highest in the world. The problem is solving for these non-market interventions that are required. And you know, I think that is going to be an ongoing challenge, and we can think creatively about some new technological tools that could be brought to bear about joint partnerships. Our allies are also interested in breaking China's stranglehold on critical minerals, so the extent to which we can find common solutions, I think that is terrific.

Senator BLUNT ROCHESTER. Are there any new initiatives that we should know about or consider?

Dr. PINCUS. You know, I think we have agreements on minerals with a lot of our close allies, and that is something that can continue to be advanced. The U.S. Government has taken important steps to identify novel tools and make funding available. And I think it is—if it was easy, we would have done it a long time ago.

Senator BLUNT ROCHESTER. Mm-hmm.

Dr. PINCUS. It is also important to remember that processing remains China's key stranglehold. There are critical minerals around the world, but China controls almost all of the processing chain. We cannot just secure access to minerals; we need to break their grip on processing.

Senator BLUNT ROCHESTER. You know, just to follow up on Senator Kim's points, I am curious, in your opinion; in what ways can we build on our strong historic partnership with Greenland while respecting sovereignty and our commitment to our NATO allies?

Dr. PINCUS. I would echo what Mr. Gray has said about making this, you know, putting Greenlanders at the center of this conversation and listening to them carefully. They very clearly want independence. They are interested in developing their minerals, but also are very concerned about environmental standards.

Greenland, the Greenlandic government was—took on the authority over natural resource decisionmaking in the 2009 Self-Gov-

ernment Act. So Greenlanders fought for the right to control their natural resources, and I think it is unlikely that they would be willing to cede that control. As we move forward with this conversation about potential acquisition, I think, as Mr. Marchese mentioned, the importance of the regulatory authorities will continue to be at the center there.

Senator BLUNT ROCHESTER. Thank you so much. I yield back.

STATEMENT OF HON. BERNIE MORENO,
U.S. SENATOR FROM OHIO

Senator MORENO. Well, thank you. Now, I recognize myself. So a question for all of you, just a quick hit here.

So starting with you, Mr. Gray, some of my colleagues on the other side of the aisle have called President Trump's desire to purchase Greenland a "clickbait distraction". Yes or no, do you characterize this conversation as a "clickbait distraction"?

Mr. GRAY. No, and it was not when Harry Truman, or Andrew Johnson, or Dwight Eisenhower did it either.

Senator MORENO. OK, Mr. Marchese?

Mr. MARCHESE. No, sir. We have a lot of mineral potential there, and it is certainly one of the options we have moving forward.

Senator MORENO. Dr. Mercer?

Dr. MERCER. Thank you for that question. But I apologize, that is outside the purview of my agency.

Senator MORENO. OK. Dr. Pincus?

Dr. PINCUS. Not at all. And I would note that President Trump's expressed interest in Greenland during his first administration yielded very significant steps forward in the U.S.-Greenland relationship. I would point to the reopening of our consulate in Nuuk as a landmark accomplishment that has done tremendous good for the U.S.-Greenland relationship. That was a direct result of his intervention in his first term. Thank you.

Senator MORENO. Perfect. So not a "clickbait distraction", in fact, actually a very worthy conversation, so let me ask you again the same—from the perspective of the 56,000 people who live in Greenland—let me just point out that is basically the size of Westlake, Ohio, where I live, as the entire population of a country that is, sorry to say it to my colleague from Alaska, 50 percent bigger than Alaska. He likes to always point out how big Alaska is versus the rest of us.

So Mr. Gray, if you were a Greenlander, would you rather have America—be part of America, a $27 trillion economy, or part of Denmark that is a $407 billion economy, given the strategic imperative, the cost of investment, the ability to yield money from the international markets, and the ability to defend yourself against Russia, and China, where this is going to become a strategic imperative; who would you rather be on the side of there?

Mr. GRAY. Well, Senator, I think the answer is obvious—that it is the United States. But the question for me is not between Denmark and the United States; it is between the United States and China and Russia. And I think that answer is even more obvious. And your colleagues had mentioned something about sovereignty. To me, this is about preserving the sovereignty of the Greenlanders from countries—from adversary nations, who have a long history of

undermining just that type of sovereignty, when our tradition has been to uphold and protect it.

Senator MORENO. And Mr. Marchese, if you think about, let us say, Greenland became a sovereign, independent country—56,000 people— how would it possibly be able to afford the kind of infrastructure improvements, mining operations, and the ability to provide for its own people as an island, literally and figuratively, financially?

Mr. MARCHESE. Senator, by itself—first of all, it is obvious now that there is not any, again according to my purview, mining there, so clearly something needs to be done. I believe that part of the problem is the way this is being, you know, I hate to use the word "sold", sold to the public. I do not think we are emphasizing enough of the benefits that the Greenlanders would get, specifically jobs.

I mean, people—I believe when people say 85 percent are against it, I think part of the perception is, it is a land grab and we are just going to impose our will upon them, versus trying to soften the image by saying: Guys, or and women, we are going to be giving you high-quality jobs, mining jobs pay significantly more than average wages across the board.

So I would be trying to emphasize the economic benefits to the population, because I do not believe that message has gotten through. But it is clear that without some form of U.S. intervention that the Greenlanders, by themselves, just cannot make it. It is a $3.5 billion GDP, that is smaller than some of the mines in the world. So they need help.

Senator MORENO. Yes, and I mean, I will close, close with this. It strikes me that to my colleagues on the Democrat side, and look, I have had an entire almost six-week term in the U.S. Senate, so as the new guy on the block, it strikes me that the knee-jerk reaction of anything that President Trump says has to be met with a complete irrational response that it is bad before ever even processing it, is what prevents us from getting great things done.

I mean, at the end of the day, what we should do is recognize that we have a Commander-in-Chief that knows the difference between Greenland and Greenville, and that is actually capable of putting a deal together—that is his actual forte. And if we can put a deal together where the United States of America can acquire Greenland and the people of Greenland are happy, it should be an absolutely bipartisan attitude. And I hope that my colleagues will get there.

I yield my time. And then recognize our Senator from Michigan who did not win the National Football Championship this year.

STATEMENT OF HON. GARY PETERS,
U.S. SENATOR FROM MICHIGAN

Senator PETERS. Thank you, Senator Moreno. That is true, but the University of Michigan is always very excited to beat Ohio State. That is really the only game that matters every year for Michigan.

Before getting to my questions, I want to first share that I recently had the pleasure of speaking with the Ambassador of Denmark and the head of representation from Greenland to discuss our long history of military and economic cooperation. Greenland and

Denmark are steadfast in their commitment to prioritizing collaboration with allies, like the United States, whether that is through increased coordination related to critical minerals, partnering on scientific research, or navigating the security concerns that are very real in the Arctic.

And certainly, that is why I find it troubling that while our ally is aggressively and actively seeking increased partnership with the United States, we have President Trump insist on purchasing land that is, let us be very clear, it is not for sale. It is just simply not for sale.

The President suggesting that the United States needs to own Greenland to defend our national security is wrong. In fact, threatening our NATO allies really in this fashion undermines our shared mission to work together as allies to counter both Russia and Chinese footholds in the Arctic as well as around the world.

Our strength as a country is economic, it is military, but it is also our friends and allies, which are incredibly important for national security.

Despite his emphasis on the strategic importance of the Arctic, President Trump has already threatened to upend our economy and our relationship with another Arctic ally with tariffs against Canada. And in recent events with the proposed tariffs, Canada did give commitments that they had already agreed to. Let us be clear, the Canadians already agreed to do the things that Donald Trump threatened and then said, "I will release the tariffs", even though we just got what Canada had already done in terms of investing in enhanced border security, something I feel passionate about.

So I am concerned we are seeing the same thing here: reckless foreign policy, and economic policy ideas that really have no benefits for Americans, and distract us from what we really need to be focused on. I am disappointed that today we have to address another ill-advised Trump administration move against an ally instead of focusing on improving our strategic coordination against those who do not share our values or our goals.

So with that, I have a few questions. First off, Dr. Pincus, Michigan certainly knows the importance of maintaining our Coast Guard's icebreaking fleet. Great Lakes icebreakers are designed to extend the operating season in Great Lakes ports, and they keep our shipping lanes open throughout a longer season than would otherwise happen. As we have discussed today, the rapidly changing Arctic landscape, marked by melting ice and increased accessibility, means that icebreakers are going to play an even more pivotal role to maintain shipping in the Arctic.

So my question for you is, given the growing competition from our adversaries—not our allies—our adversaries in the Arctic, what challenges do you believe we need to overcome to increase our icebreaker fleet?

Dr. PINCUS. Thank you, Senator, for that question. We have significant challenges with U.S. icebreaking. Our fleet is at perhaps its lowest historical point, and that is a weakness that is being exploited by our adversaries. We see Chinese icebreakers in the Arctic every year now, and I do not think that is a surprise. I will say that the challenges we face with regards to icebreaking are not

unique to icebreakers. They are symptomatic of the broader problems plaguing U.S. shipbuilding as a whole.

The Wilson Center has undertaken extensive stakeholder consultation on these issues. What we have heard is basically this: Government is a bad partner to do business with. The industry in the U.S. and beyond faces a list of challenges, availability and stability of funding for shipbuilding, competition for skilled labor, it is hard to build an icebreaker; it takes unique welding expertise, for example, and inefficient trade barriers.

Government clients are risk-avoidant and let perfection be the enemy of progress. I think while we have some major comparative advantages over China, particularly in our strong network of alliances, we can leverage those more effectively to improve icebreaker construction. I would flag the ICE Pact, which is a trilateral agreement between the U.S., Canada, and Finland, to cooperate on the production of Polar icebreakers, and potentially also Great Lakes icebreakers, as having potential to leverage allied expertise, and this may have carry-on effects across shipbuilding more broadly.

Senator PETERS. Great. Great. Dr. Mercer, I know that both Arctic and Antarctic research requires collaboration across a number of government agencies; and that this research is absolutely key to our understanding of how to operate in those regions. So my question to you is, in addition to the economic and security importance of the Coast Guard's role in overseeing our icebreaker fleet, which we just talked about, could you discuss the role that the Coast Guard plays in supporting NSF work, and how important that is to support?

Dr. MERCER. Absolutely. We have a very strong working relationship with the Coast Guard both in the North and the South. In the North, NSF actually funds all the science capability on the HEALY as well as the technicians that operate the science capability on the HEALY. We also fund a lot of research that happens aboard the HEALY. For example, when it was transiting from Alaska over to Greenland, north of Russia, we had active research on that cruise last year.

Senator PETERS. Great. Thank you. Thank you, Mr. Chairman.

The CHAIRMAN. Thank you, Senator Blackburn.

STATEMENT OF HON. MARSHA BLACKBURN, U.S. SENATOR FROM TENNESSEE

Senator BLACKBURN. Thank you, Mr. Chairman. And thank you to each of you for being here.

Mr. Gray, I want to come to you. Many of us have seen what China has done in Africa around Djibouti with the port that is there, and also in Latin America, and we have listened to Xi Jinping and the CCP leadership talk about the Polar Silk Road, and putting this as a part of their Belt and Road Initiative. So I would like for you to talk about why it is important that we strengthen this bond with Greenland and pay more attention to this because of the impact of the CCP?

Mr. GRAY. Senator, it is a great question. This is a playbook that the Chinese Communist Party wrote. They do it all over the world. I have seen it personally in the South Pacific, they do it in Latin America, they do it in Southeast Asia, in Sub-Saharan Africa. They

start by, you can call it the Belt and Road Initiative, you can call it the Polar Silk Road, whatever terminology they want to use, but what it is, is predatory lending, primarily usurious interest rates for what we often call "white elephant" projects, projects that very often serve no economic purpose——

Senator BLACKBURN. And do not last. And then they are stuck with debt diplomacy.

Mr. GRAY. Exactly. And once they have the debt diplomacy, ma'am, the Chinese come in and use that as a—for coercive political control over small, developing states that cannot push back, and do not have the ability to counter the CCP's maligned influence.

And what I am so concerned about, and why I think this topic is so critical, is that something very similar, we are beginning to see bits and pieces of this in the High North, in the Faroe Islands, in Greenland, to some extent in recent years, we have seen it in Svalbard, we have seen it in Iceland. This is beginning to happen. The Chinese are signaling their intention to pursue this more actively, and that is why we have—because we know the playbook, we need to be prepared to push back proactively.

Senator BLACKBURN. Dr. Pincus, I want to come to you because I had seen a quote from Biden's NSC Council Director Brennan, and he made a comment at a Wilson Center event in 2022, that the U.S. has accepted that China has a—and I am quoting him—"Vested interest in the Arctic". I completely disagree with that because China, just because they are calling themselves a near-Arctic neighbor, does not give them a vested interest.

And I want you to talk a little bit about that type of attitude, with that perspective that China is using this for their security and endangering our national security?

Dr. PINCUS. Thank you, Senator, for that question. China has expressed its interests in the Arctic with an Arctic Policy Statement that came out in 2018, and they mention a host of interests that they have in the region. They talk about the emergent shipping lanes, they talk about natural resources, they talk about scientific data. And so those are their articulated interests in the region. And I think it is—you know, in terms of their economic interests, China is a resource-importing country. There are a lot of resources in the Arctic region. It is not surprising that they would pursue those resources.

Their pursuit of those resources is adverse to the interests of the United States.

Senator BLACKBURN. OK. Let me—Mr. Gray, I want to pivot to you on this, because China focuses on dual-use technologies, and of course, we do not know where the China Economic Development Department, MOFCOM, ends— pardon me—and their military begins. And this is what they couch as dual use. And I would like for you to give what you see as specific steps that we can take against the CCP in this regard to stop them from using this as a research and test site?

Mr. GRAY. It is an incredibly important question, Senator. I think this is where my concerns about the current trajectory of the political relationship between Denmark and Greenland are so acute. We have to have a plan for this—the reason you outlined

and for reasons of even more conventional military purposes. We have to have a plan for what comes next.

And if we do not know what the 56,000 people in Nuuk, what their political organization looks like post-Copenhagen, which they say will happen, what you are describing is going to become even more prevalent. And we have seen this happen in places in the South Pacific that are similarly sized. We have to have a plan for what comes next.

Senator BLACKBURN. Thank you. Thank you, Mr. Chairman.

The CHAIRMAN. Thank you. And I would now like to recognize Mr. Sullivan, who also is going to preside while I run down to the floor and vote.

STATEMENT OF HON. DAN SULLIVAN,
U.S. SENATOR FROM ALASKA

Senator SULLIVAN [presiding]. Thank you, Mr. Chairman, and thank you very much for holding this very important hearing. You know, the Arctic issues are something that, as the senator representing the only Arctic state in the country, I care deeply about. So I appreciate the Chairman focusing on this.

You know, I want to first mention, I think the idea of the President looking to purchase Greenland has already been mentioned by a number of the panelists. Other presidents have thought about this. I think it is a wonderful idea if we can pull it off. Truman, Andrew Johnson, others did. But I also think it is important to remember—this is an op-ed I wrote in The Wall Street Journal a couple weeks ago, saying: Hey, Greenland is nice, good to go if we can get it, but remember our Arctic state, Alaska. Because everything that people talk about with regard to Greenland, we have in spades already in America, it is called "Alaska". Arctic location, strategic and critical minerals, oil and gas, cornerstone of America's missile defense, it is all there.

The problem is, as the panelists know, when Democrats get in power, Biden was the latest example, they want to turn Alaska into a national park, not recognizing our state for what it is, which is a strategic crown jewel for America. The Father of the U.S. Air Force, General Billy Mitchell, in testimony before Congress in the mid-1930s, called Alaska the most strategic place on the planet. And it is.

So that is what we are focused on, do not forget Alaska. Fortunately, unlike President Biden, President Trump has already made it very clear that he is not going to forget Alaska. On day one, the President signed an executive order called "Unleashing Alaska's Extraordinary Resource Potential", and I want to thank President Trump and his team for doing that.

It goes into everything that this hearing has talked about, strategic minerals, oil and gas, natural gas, getting the Military involved. We just introduced my legislation called the IRON DOME Act, which is all about missile defense. Alaska is the cornerstone of our country's missile defense, and we can build that out even better. So I appreciate what President Trump is already doing on Alaska.

But it is not as if our adversaries do not recognize the strategic importance of Alaska or the Arctic.

Next slide: This is what does not make a lot of news in the Lower 48. In the last 3 years, we have had an enormous amount of Russian incursions into our airspace, America's airspace, Alaska is, yes, it is, naval incursions into our EEZ, and just in the past year, these are some depictions of this, this is another slide we have. This gives you all the Russian, Chinese joint strategic bomber incursions into our ADIZ, and very disturbingly, joint naval task force in our EEZ. So our adversaries clearly understand the Arctic.

Can we put that alongside of there, just so—the one you had before this one? Yes. Perfect.

So that is a wind up to a question I want to ask the panelists. Mr. Gray, why don't we start with you? Given this, right, how important is America's Arctic, I have been talking to Secretary Hegseth, the President, others, and Alaska not just for missile defense, but to push back on what is clearly happening.

We had a meeting on uh what we are going to be doing on the border, a lot of discussion with the President's team on the northern border. This is the northern border and our adversaries are all over it, and in my view what we need is a lot more infrastructure, a lot more military, a lot more missile defense, a lot more unleashing Alaska's critical minerals, oil and gas, and we could not have a better partner right now with President Trump, and the contrast between him and President Biden who wanted to make my state a national park.

He issued 70 executive orders, 70, singularly focused on Alaska to shut us down. President Trump has wiped that out, but what is your sense on how we need to respond to this, in America's Arctic, which is Alaska and the potential that Greenland could add to this, because that is the other part of the Arctic, not the Alaska part of the Arctic?

Mr. GRAY. Senator it is incredibly important, I think we have to look at our hemisphere holistically, from the Aleutians to Greenland, from pole to pole, and have a—and President Trump began this process in his first term——

Senator SULLIVAN. Yes.

Mr. GRAY. This holistic Arctic strategy that I was pleased to be involved in. We have to, from a military standpoint, we have talked about icebreakers but we have to have——

Senator SULLIVAN. All right. Just real quick on icebreakers, Russia has 54, some of which are nuclear, many of which are weaponized, we have two and one is broken. Do you think that is peace through strength when it comes to icebreakers?

Mr. GRAY. It is not.

Senator SULLIVAN. Continue. Sorry to interrupt you.

Mr. GRAY. It is, obviously, the icebreakers are key particularly when we think about what the adversaries are doing with nuclear powered icebreakers, growing their fleet, when we think about the limited—the Limited C–130 capacity that we have now for Arctic takeoff and landings, when we think about just the general attrition of Arctic War Fighting capabilities since the end of the Cold War and the lack of investment in them.

I know DOD will likely have its own Arctic strategy. We have to have Arctic warfighting capacity and deterrence as a much higher

level priority. And I think your chart and what your state is dealing with is a perfect example of why.

Senator SULLIVAN. Great. I am going to turn to Senator Schmitt here. I know cares about these issues as well. And then I will have some follow up questions if there are no other senators coming back.

So Senator Schmitt.

STATEMENT OF HON. ERIC SCHMITT,
U.S. SENATOR FROM MISSOURI

Senator SCHMITT. Thank you, Senator. For 80 years, nearly 80 years, the United States has provided the security blanket that has kept NATO allies safe, yet when President Trump raised valid concerns about Greenland's security NATO talked about protecting Greenland, not against Russia, not against China, but against the United States. That is totally absurd.

The reality is that President Trump's messaging is about defending not just America, but also our NATO allies against Russian and Chinese aggression. The reality is the real threat in the Arctic is Russia and China and it is growing.

Russia has reactivated Soviet Air bases, expanded its nuclear icebreaker fleet, and sent submarines into Greenlandic waters, one of which was only detected by chance. China, despite being 900 miles away, calls itself a near-Arctic state, and is issuing, or is using its Polar Silk Road to expand its influence over Greenland's infrastructure.

Despite these mounting threats, Denmark has failed to provide adequate security for Greenland. The Island's 27,000 miles of coastline remain largely unmonitored, and foreign vessels repeatedly enter its waters unchecked. The U.S. cannot afford to sit back while others neglect these responsibilities. The Arctic is a key frontier in global competition, and Greenland is central to U.S. security. Whether we acquire Greenland, increase military presence, economic investment, or formalize security arrangements, we must ensure Greenland's future aligns with U.S. interests, not Beijing's, and not Moscow's. Whether through increased military presence, economic investment, or formalized security arrangements, we must act now to secure the Arctic for ourselves and our allies.

So with that, I do want to ask Mr. Gray, I mentioned the Polar Silk Road, how would you compare that to the One Belt One Road Initiative?

Mr. GRAY. Senator, I think of it as just the Arctic polar adjunct of Belt and Road. I think it is just—we know the playbook, as I said to Senator Blackburn, this is what the Chinese do to gain economic and then coercive political influence. It is the same playbook with a different name.

Senator SCHMITT. And, as we have seen in other places around the world, when they build a grid, they can turn it on or they can turn it off. They build an airport, and you are critical of the CCP, and all of a sudden you do not have flights anymore. I mean, this is incredibly dangerous in a place like Greenland, which, by the way, is also part of the discussion about Panama, in the Panama Canal, right? This, having China control both ports on either end

of that canal, is incredibly dangerous for us, from a military perspective and an economic perspective.

Mr. Marchese, did I pronounce that right?

Mr. MARCHESE. Close enough.

Senator SCHMITT. Close enough, sorry. I apologize. I do want to ask you about, you may have mentioned this before, the potential economic value of that mineral wealth. And in this broader discussion we have about supply chains and having them, you know, not be relying on China, how valuable is that to the United States and the freedom-loving world?

Mr. MARCHESE. Well, Senator, it is extremely valuable. But as I mentioned, sir, it will take, in my opinion, significant capital from the United States in order to get private industry. The United States should not be in the business of operating critical mineral resources. So it should, in my opinion, be the private sector. But it will take, in my opinion, significant incentives for the private center—the private sector, not necessarily—well, the significance of the upfront money would be to derisk or somewhat help derisk these projects. It is all about risk and reward.

That is why, if you look at the map today, there are very few projects that are in existence. It is just the uncertainty of what is really there.

Senator SCHMITT. So in the half a minute I have left, what specifically—I mean, you started to sort of outline that. What is it, if we wanted to endeavor and we had a sort of working with them, what steps would we take to move forward on that?

Mr. MARCHESE. Well, Senator, the first thing we have to do is actually, like anything, identify what is there. We have, at this point, just literally scratched the surface of what is there. The sampling that has been done just indicates this is there. What we do not know is how much of it is there, the grade of what is there, and how difficult it is to—when I say "difficult", the level of difficulty it is to process these materials.

So there are a lot of unanswered questions, which the average private company just is not in a position to undertake. And the very largest mining companies, they are risk-averse. These are not individuals that are accustomed to what I would call high-risk investments. So it takes a different mindset when you go into a country like Greenland than, for example, staying in the United States.

Senator SCHMITT. Well, one of the things I think has been the hallmark of President Trump's foreign policy, and certainly what I believe in, is identifying what are our core national interests. I think this era of adventurism is over. What are the core interests of the United States of America? And I think Greenland sits sort of front and center with that. So I appreciate the conversation and the hearing today. Thank you.

Senator SULLIVAN. Senator Hickenlooper.

STATEMENT OF HON. JOHN HICKENLOOPER, U.S. SENATOR FROM COLORADO

Senator HICKENLOOPER. Thank you. Mr. Chair, thank you all for being here.

Dr. Pincus, several Colorado institutions are actively conducting research to advance the Department of Defense's 24 Arctic strat-

egy, the Center for National Security Initiatives at CU Boulder, Washington, to sensing technology, energy, cybersecurity, the Center for Combat Medicine and Battlefield Research at the Medical Center at CU Anschutz has taken a leadership looking at Arctic casualty care, for war fighters there.

Dr. Pincus, how can we continue to foster partnerships between the Department of Defense, and the academic and research community on these—to support these national security efforts in the Arctic?

Dr. PINCUS. Thank you, Senator, for that question. And, and I appreciate you flagging the strong connections and support between the Department of Defense and our research and academic institutions, which has played out particularly in the polar regions, both the Arctic and Antarctica have long been places where there is been close cooperation between U.S. science institutes and the U.S. Military, and that has redounded to the benefit of the United States.

We have world-leading scientific capacities. We have a technology-based economy, and that comes out of decades of support for basic science and research, and also, you know, all of the tech spinoffs that come out of that.

And so I think, you know, you have listed a couple of examples of research efforts that are likely to provide economic benefits as well as military advantages. I think that is always been very important, militaries must constantly innovate to dominate, and you know, the polar regions are places where that is especially true given their unique challenges. Thank you.

Senator HICKENLOOPER. Great. And I appreciate that. And certainly, I remember 30-something years ago, some of the scientific research into the Arctic was derided as being useless; and the scope of history requires us to keep looking and being curious. I had a friend who was a geologist who cross-country skied across Greenland in 1985. It is pretty flat, at least until you get to the coast.

Dr. Marchese, obviously, we talked about the critical and rare earth minerals that are in Greenland. However, as you have mentioned, they are mostly locked in the ice, the cold weather and winter mining. I mean, you really cannot do too much in the winter there, so-called.

The U.S., one of our great advantages against China and Russia has always been our allies, our network of alliances and partners, many of whom have extensive mining experience. Canada—excuse me—Canada obviously has a lot of experience in coal mining, Japan, seafloor mining. How might the new critical mining—the critical mineral mining ventures in Greenland benefit from that shared expertise?

Mr. MARCHESE. Good question, Senator. Unfortunately, most of the downstream, which is the processing capabilities in the world, are located in Southeast Asia, and specifically China. China prohibits their researchers and professionals from doing this in other countries. So even if Greenland—you know, in an alternative universe, if the United States said: Hey, we want your help, they would not give it to us just because it is prohibited.

There is expertise in Africa. There is expertise in, in South America. But again, it depends on the type of mining you are refer-

ring to. So for example, there is significant expertise around the world in base metals, so copper, aluminum, things like that, no problem finding expertise anywhere.

Senator HICKENLOOPER. Right.

Mr. MARCHESE. When you start getting into the critical mineral area, as I said, most in Southeast Asia, but specifically some in Europe. So they, in my opinion, would have the expertise available, but in——

Senator HICKENLOOPER. I understand what you are saying. It is complex. It is not easily accessible.

Mr. MARCHESE. Yes.

Senator HICKENLOOPER. Got it. Dr. Mercer, as you know Arctic research in remote, austere environments, through the National Science Foundation, through NOAA requires again, close collaboration with our partners, our allies. The funding freeze issued by the Office of Management and Budget could really disrupt some of these research efforts, from the Bipartisan CHIPS Act, CHIPS and Science Act, Congress directed the NSF to create an Office of Research Security and Policy, you know, responsible for identifying and addressing security risks that impact research integrity of the U.S. projects.

In your view, does the increasing presence of China and Russia in the Arctic region show or create any new research security risks that Congress should be especially vigilant about?

Dr. MERCER. Thank you for your question. The Office of Polar Programs in NSF works in close partnership with our Office of the Chief of Research Security Strategy and Policy. We are also—NSF is also a member of the National Counterintelligence Task Force, to work with the intelligence community and law enforcement partners on research security issues, something we take very seriously.

But as far as the rest of your question, I would be happy to take that back to NSF and, potentially, arrange a conversation in a different setting.

Senator HICKENLOOPER. Perfect. Thank you very much. I yield back to the Chair.

Senator SULLIVAN. Senator Young.

STATEMENT OF HON. TODD YOUNG,
U.S. SENATOR FROM INDIANA

Senator YOUNG. Thank you, Chairman. Thank you, witnesses, for being here. I would like to begin with critical minerals and trade, building on some of my colleague, Mr. Hickenlooper's questions.

The headlines have recently been focused on acquisition of Greenland under different scenarios. But what I actually find more plausible, and therefore more interesting is some sort of trade relationship that might be deepened. Greenland holds vast reserves, as we know, of critical minerals and sits outside of China's supply chain dominance. And I think a trade partnership with Greenland could strengthen our mineral security in the fairly near term. Let me know if I am wrong on that predicate. But I also think that without investment in processing, we risk repeating some past mistakes that we have made in terms of these trade relations.

A smarter approach might be to go beyond extraction and ensure that trade agreements support investment in refining, processing,

and manufacturing to work together with our counterparties and build a resilient supply chain, rather than shifting dependencies. We know that trade deals alone will not solve our problems, but they will certainly make great strides toward reducing our dependencies.

Without addressing permitting delays, and infrastructure gaps at home, even the best agreements could take years to deliver real results. So Mr. Marchese, [Mar-kee-se], Mr. Marchese, so I am close?

Mr. MARCHESE. [Mar-kay-se].

Senator YOUNG. OK. I am sorry, sir. If a trade agreement were to be considered with Greenland, what specific policy incentives should be included to ensure that rare earth elements are not just extracted, but also processed and refined in a way that strengthens U.S. supply chains?

Mr. MARCHESE. Senator, great question. I will disagree with you somewhat, though.

Senator YOUNG. Yes.

Mr. MARCHESE. I believe the—I believe we risk making the same mistakes in Greenland as we have in the United States, which is that the Federal Government provides a lot of potential financial assistance for downstream processing. So process to your heart's content; we will help you, but finding sources, which is, as I mentioned in my testimony, upstream, zero money available.

Senator YOUNG. Yes.

Mr. MARCHESE. In my opinion, it is significantly easier to get funding once you have the upstream part solved. Finding the mine, developing the mine——

Senator YOUNG. Right.

Mr. MARCHESE.—in my mind is significantly more important than processing it. You have get lots of money. There are lots of people who would give you capital to process something, but you have to have the supply to begin with. And in this country, we do not provide money for exploration and discovery. You know, in our alternate universe, we would love to have every other country deliver material so we can process it.

Senator YOUNG. Yes. So, I am learning, Mr. Marchese. I am learning from you. You are familiar with some of the solutions that are offered here on the Hill. One has been to—and this has been spearheaded by Senator Cornyn, to work with our friends around the world and our U.S. Geological Service to identify where all the mineral reserves are, and then do our best to project out into the future demands for those various minerals, and processing capacity, and just kind of map all the stuff out, as one would do when you are managing a project.

Is that the sort of assistance that might help take some risk out of the markets and unlock more private capital?

Mr. MARCHESE. Senator, absolutely. As I mentioned earlier, it is called "mineral characterization". We absolutely need to do that first in order to allow a private company—and mostly smaller companies. As I said, larger companies are risk-averse.

Senator YOUNG. Yes.

Mr. MARCHESE. They will pay you handsomely to buy something from you once you have developed it for them. We are not at that point. So we need smaller—typically the smaller companies are

going to be coming in to do this type of exploration, they just do not have the capital to undertake these. So yes, in my opinion——

Senator YOUNG. Maybe that paired with something I was alluding to, again not to—I am not suggesting that all would be sufficient, but collectively, would that be constructive toward reducing our dependencies?

Mr. MARCHESE. Yes. Senator, yes, as long as we have upstream as well as downstream funding, I think we are on the right track.

Senator YOUNG. Very helpful. Thank you. If I could just ask one more question related to icebreaking. Mr. Gray, can you describe how our lack of multiple functional icebreakers affects our influence in the Arctic region? Just for my constituents, if yes?

Mr. GRAY. Well, Senator, it just limits our capacity to go where we need to go, when we need to go. It limits deterrence, it limits presence, it limits our ability to have domain awareness of critical sea lanes, and it cedes the—it cedes the key seaways to adversaries who are making those investments who, China and Russia, who are building the world's largest icebreaker fleets, including nuclear icebreakers.

Senator YOUNG. And not just military, it does not just cede the military playing field to them; it cedes the commercial; is that accurate?

Mr. GRAY. It does. And what I would say, though, on the Chinese particularly, I think the commercial is oftentimes a predicate for future military activity, and that they are intricately linked in the Chinese context.

Senator YOUNG. As Mr. Mahan said they would be.

Mr. GRAY. Sure.

Senator YOUNG. Absolutely, right. OK, Mr. Chairman, thank you.

Senator SULLIVAN. Senator Klobuchar.

STATEMENT OF HON. AMY KLOBUCHAR,
U.S. SENATOR FROM MINNESOTA

Senator KLOBUCHAR. Thank you, all of you for being here. I just want to point out again that Denmark and Greenland have made clear that Greenland is not for sale, and I am—hearing thus on the acquisition of Greenland and the problems it is causing with our allies, seems strange to me when we just got the report that inflation is going up, and I think we should be more focused on those things. But I am happy to dive in. Being from a state that has a lot of snow and having been to Greenland, I would love to talk about this.

As my Republican colleague, Senator Murkowski of Alaska, said in a joint statement with a member of the Danish Parliament, the future does not require us to redraw the borders on the map, but to work harder than ever to cross them.

Dr. Pincus, do you agree that strengthening our alliances advances our strategic objectives in the region?

Dr. PINCUS. Thank you, Senator, for that question. I would say that from a policy analytic perspective, the U.S. has clearly defined national interests in Greenland and across the Arctic, and we have identified some challenges and some problems that we are turning our attention to. We have a range of policy options, and I think it is the job of the President and the Congress, of policymakers, to

make those policy determinations, balancing relative priority, risk, and cost.

So again, with regards to Greenland, we have a range of options, and there is a spectrum in there, and I think at the lower-cost, a sort of lower-hurdle part of that spectrum, I would put diplomatic arrangements, treaties, defense agreements.

Senator KLOBUCHAR. OK. Thank you. I am concerned about the freezing, since we are talking about freezing lands, freezing of Federal grants and assistance. That can seriously harm our global competitive advantage, including in the Arctic. For instance, the National Science Foundation's Office of Polar Programs guides critical research on Arctic issues. For example, the University of Minnesota's Polar Geospatial Center has been working on digital mapping with support, which is going to be really important as we look at what is happening with Russia and other countries that are not our friends, China, that are heading there.

What role, Dr. Mercer, can the University research community play in preparing the U.S. for future civilian and military operations in the Arctic region?

Dr. MERCER. Thank you for that question. America is the world's leader in scientific research, and our work—NSF's work, or the work that we support in the Arctic, including that of the University of Minnesota and the Polar Geospatial Center, is really important to the U.S. As I noted before, we are strong collaborators with other U.S. Government agencies, including various Department of Defense services, and as well as the Government of Greenland.

So I think that that relationship—those relationships between academia and the various government institutes that further research in the Arctic, are really important.

Senator KLOBUCHAR. OK. Dr. Pincus, different topic, icebreakers, a big deal for the Great Lakes, and as you can imagine, last November, Canada, Finland, and the U.S. formalized the Icebreaker Collaboration Effort Pact, known as the ICE Pact, very creative, to build more icebreaker ships' essential tools to open trade routes. I have talked to representatives of both countries outside of the U.S., Canada, and Finland about this. How can we maximize our collaboration with Canada and Finland in the Arctic? And I know you share my concerns about slow momentum for building in the U.S. What more can be done to boost the domestic manufacturing?

So first question on Finland and Canada, the second one is what we can do here besides getting more icebreakers in conjunction with them, and maybe that is the answer, so?

Dr. PINCUS. Thank you, ma'am. I appreciate that. The Wilson Center has been consulting extensively on the ICE Pact and on icebreaker construction, and there are a number of hurdles here, and they include labor and workforce challenges. There is a shrinking talent pool, and shipyards are competing for skilled labor. We do not have a national shipbuilding strategy or unified shipbuilding plan to help align yards and ships for best fit. Our contracting practices are often adverse for business interests.

For example, we often use firm fixed-price contracts on first-in-class ships and vessels, and that places all of the risk on a shipyard. Our specifications and requirements are often—often permit perfection to be the enemy of the good. And so I think there is a

lot of things that we could do, and lessons that we could learn from our foreign counterparts in terms of leveraging their expertise and speeding up our acquisitions.

But one point I do want to make is that the Coast Guard cannot just get more hulls. Yes, we need a lot more icebreakers, but they also need people, and they need funding to run those hulls. We see the recent acquisition of the Estoris, that is going to be years before it comes into operational capacity because of the refits that is going to need, and the Coast Guard is under strain now with demand for its mission set.

We are seeing challenges meeting all of those demands. There is strain placed on people and families. This is true for the Navy as well. The world wants the Coast Guard to be in a lot of places, and the Navy to be in a lot of places. And so I think we definitely need hulls, but we also need people.

Senator KLOBUCHAR. And how do you see—the last question—the ICE Pact working with Canada and Finland in helping?

Dr. PINCUS. I think it is a little too soon to say there is tremendous potential there, but the implementation is going to be the real challenge right now. We have plans in place, but there have not been resources appropriated to support the implementation of ICE Pact. So I think DHS and Coast Guard are working through some of those challenges, and it will be interesting to see if we can make some creative solutions around relaxing trade restrictions, perhaps permitting in skilled labor that could help us build icebreakers faster, perhaps relaxing some ITAR restrictions on tech sharing.

So I think there are a lot of ways for innovation, but we have to pick our targets. And again, apply that sort of range of analysis. What is the top priority? Where are we willing to accept some risk and pay some cost? Thank you.

Senator KLOBUCHAR. Thank you.

Senator SULLIVAN. Thank you, Senator Klobuchar. I am going to just wrap up with a few more questions for the panel here. First, going back to this chart, I want to get a sense of why do you think this has been a pretty dramatic increase from Russia and China in joint—unprecedented joint naval and strategic bomber task forces into our airspace, into our waters, our EEZ.

And related to that, you know, Mr. Gray, you talked about presence. You cannot have presence without infrastructure. I think it is high time that we start looking at more infrastructure to be able to address this. We are going to have a hearing with the NORTHCOM Commander on the Armed Services Committee tomorrow, and I am going to talk a lot about looking at potential bases.

There is an incredible Navy base out here, the Adak Naval Base, was closed during BRAC. It could be a great sub-base, Naval Air Station base, surface warship ship base, huge refueling capacity right there flanking the Russians and Chinese, very strategic. We are trying to get a strategic port built in Nome, Alaska, but otherwise, we have very little infrastructure from which to launch military, economic, and icebreaker capabilities.

So maybe just a quick question for all the panelists: Do we need more infrastructures in America's Arctic? And now, I am not talking Greenland. This hearing is about strategic interests in the Arc-

tic. We are an Arctic nation solely because of that great state, Alaska. So what is your sense? For all the panelists on infrastructure in the Arctic to combat what is a very, very aggressive move by our adversaries? And, by the way, just talking to the NORTHCOM Commander, we had one of the busiest times ever in terms of aggressive incursions, joint Chinese-Russian operations.

That is unprecedented. He thinks this year it is going to be even more. So we have got to be ready for America, protecting America right now. What is the sense of the panel on infrastructure in America's Arctic?

Mr. GRAY. Senator, I could not agree more. We have to have more infrastructure not just from a defensive presence standpoint to protect our homeland, but also from a power projection standpoint.

Senator SULLIVAN. Yes.

Mr. GRAY. You know, we have allowed our Arctic infrastructure, in addition to a lot of our general defense industrial infrastructure, to atrophy. I think this would be a huge way to boost our capacity to deter in the Arctic.

Senator SULLIVAN. Great. Mr. Marchese, do you have a view on that, sir?

Mr. MARCHESE. Senator, I could not agree with you more. You are preaching to the converted. We, in my opinion, need significantly more infrastructure spending, not only in Alaska but in the United States. You know, there is no—there is nothing wrong with fishing at your feet. I mean, we have everything we need here. It is great that we are going to Greenland, but let us concentrate on what we can control, which is United States' investment.

Senator SULLIVAN. Great. Thank you. Dr. Mercer.

Dr. MERCER. Thank you for the question, sir. As I said before, America is the world's leader in scientific research, and that is certainly true in the Polar Regions, we rely on heavily, in order to be the leader in research in the Polar Regions, on the Coast Guard icebreaker, the LC–130 aircraft, the C–17 aircraft, the Space Base Pituffik in Greenland.

And as I noted in my opening testimony, we are in the process of designing—in the design process, to recapitalize and modernize Summit Station at the center of the Greenland Ice Sheet.

Senator SULLIVAN. Great. Thank you.

And Dr. Pincus.

Dr. PINCUS. Thank you, Senator. I agree that we are seeing increased adversary presence in the region because they perceive weakness on their part, and so they are pressing us.

Senator SULLIVAN. Yes. And by the way, it is not on this chart. I have another one that shows they are—I think some of the witnesses said this earlier—they are building up their infrastructure, particularly military, but also energy and critical mineral infrastructure in a huge way in the Arctic, and we are still kind of, I agree, kind of exuding weakness.

Dr. PINCUS. But I would also note that we face multiple challenges in Alaska. In addition to extending and expanding our presence there, we have challenges with coastal erosion and some of the permafrost issues.

Senator SULLIVAN. Yes.

Dr. PINCUS. So there is money that needs to be put into current DOD installations to harden them. We are also seeing the expansion of wild land fires and other novel challenges. So I think efficient spending decisions to get as much bang for our buck is important, so we can meet the full range of national security through economic and community concerns related to that really wide range of challenges.

Senator SULLIVAN. Right.

Dr. PINCUS. So you know, I would put the Coast Guard at the top of the list because it has got a broad mission set, and its assets can be utilized for a lot of different purposes. Obviously, DOD assets can be applied to civil disasters as well. And then new technology that can help us respond effectively and juggle competing demands, whether it is from a massive wildfire, a big coastal storm like some of the storms we have seen in Western Alaska, or military challenges. We have to do all of those at the same time. So it is a real big problem set, and I appreciate you flagging it.

Senator SULLIVAN. Good.

Dr. PINCUS. Thank you.

Senator SULLIVAN. Well, listen, we are going to be working on this. Our budget reconciliation plan here on the Senate side is going to have a lot of resources for our military, for the border, by the way, the northern border, as well as the southern border, and the Coast Guard, and I think that is going to be welcome, hopefully, in a bipartisan way.

But listen, I want to thank the witnesses. This has been a great hearing. The issue of the Arctic is a really important one. I appreciate the Chairman putting this on the agenda really early in his tenure.

Senators will have until close of business on Wednesday, February 19, to submit additional questions for the record from our witnesses. We respectfully request the witnesses to try to get those back by Wednesday, March 5, to respond to questions for the record. Again, thank you. Great panel today, a lot of interests, as you can see, in a bipartisan way, on Greenland, on the Arctic. We have got a lot more work to do.

This Committee stands adjourned.

[Whereupon, at 12:18 p.m., the hearing was adjourned.]

A P P E N D I X

I'M A GREENLAND EXPERT—THESE 3 PATHS CAN MAKE IT AMERICA'S NEXT FRONTIER

By Ronald Lauder

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REUTERS

When President Trump in 2020 first raised the idea of acquiring Greenland, he was met with universal derision.

The Danish prime minister dismissed the notion as "absurd," while a former Danish leader called it an "April Fool's Day joke." The establishment media treated it as a punch line.

Once again, the critics were wrong, and their narrow-minded thinking has been revealed. Trump's Greenland concept was never absurd—it was strategic.

Top reason to grab Greenland:

> On the grand chessboard of global power, geography is destiny. The Arctic, once a frozen afterthought, is now the front line of strategic competition and cooperation.
>
> At its heart lies Greenland—the world's largest island, with immense untapped potential and irreplaceable geopolitical significance.
>
> But for Greenland to achieve its dream of independence, it must secure its economy and defenses. The United States can help.

I have worked closely with Greenland's business and government leaders for years to develop strategic investments there, even as the Biden administration, unsurprisingly, ignored and underestimated its vast opportunity.

Beneath its ice and rock lies a treasure trove of rare earth elements essential for AI, advanced weaponry and modern technology.

As ice recedes, new maritime routes are emerging, reshaping global trade and security.

Moreover, Greenland, an epicenter of great-power competition and human and natural potential, offers a strategic partnership waiting to be forged.

Since the 2009 Self-Government Act, Greenland has exercised increasing autonomy from Denmark's century-old sovereignty, including the ability to lease land without Danish approval.

A referendum on full independence could happen at any time, so the United States has a narrow window to strengthen ties before other powers move in.

By all available evidence, the Trump administration can successfully negotiate a deal with the Greenlandic government to bolster both our economic and national security and theirs.

Multiple viable paths can advance this vision—each securing America's interests while honoring the aspirations of the Greenlandic Inuit people.

One option is to fully activate the 1951 Defense of Greenland Agreement, which granted the U.S. exclusive jurisdiction over defense installations and personnel in Greenland under NATO. In exchange, the United States committed to Greenland's protection during the Cold War—given Denmark's limited capacity to do so—and delivered on that imperative.

This agreement allows the U.S. to negotiate long-term leases for key areas, including sites rich in rare-earth deposits, deep-water ports or suited for military bases.

Expanding such leases, like the one now in effect for the US-operated Pituffik Space Base, could drive immediate economic growth through infrastructure investment and job creation. Over time, as trust deepens, this framework could ultimately bring Greenland into sovereign alignment with America.

Another option is a Compact of Free Association (or COFA), modeled after U.S. agreements with the Pacific island nations of Palau, Micronesia and the Marshall Islands.

A COFA with Greenland would preserve its self-governance while providing U.S. defense guarantees, economic aid, expanded trade and other benefits. It would strengthen Greenland's autonomy while securing America's strategic foothold in the Arctic, anchored by Alaska.

As another option, the United States could form a new trilateral agreement with Greenland and Denmark to formalize Arctic cooperation.

That would allow Denmark, too, to benefit, collaborating with the United States on vital energy and rare-earth processing projects and enhancing regional stability.

For Greenland, a deeper partnership with the United States promises transformative benefits.

American investment could diversify its economy, create jobs and modernize infrastructure, raising living standards across the island.

Education and technology exchanges would let Greenlanders shape their own future—one rooted in both independence and prosperity.

Crucially, a strong alliance with the United States would safeguard Greenland's sovereignty, shielding it from undue influence by China and other foreign powers.

For the United States, the stakes are equally high.

A stronger U.S. presence in Greenland would counter adversarial militarization of the Arctic, block economic encroachment by competitors and secure control over vital rare-earth resources—reducing American dependence on vulnerable supply chains now dominated by China.

Militarily, Greenland is a perfect twin to Alaska. Their locations on either side of the continent join into a strategic linchpin, offering forward bases essential for Arctic, North Atlantic and North Pacific security.

When President Harry Truman proposed purchasing Greenland in 1946, the idea was dismissed as unrealistic. Today the stakes are even higher, and the opportunity even greater.

To know Greenland is to understand that it is not just another strategic asset: It is America's next frontier.

By acting now with vision and resolve, Trump can secure America's leadership in the Arctic for generations to come—while helping Greenland achieve its aspirations as a partner, an ally and perhaps, one day, part of the American family.

Ronald S. Lauder is president of the World Jewish Congress and former U.S. Ambassador to Austria.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. ROGER WICKER TO ALEXANDER B. GRAY

Question 1. Ship traffic in the Arctic has increased 37 percent in the past decade. China and Russia have decided to work together to develop shipping avenues in the Arctic. Greenland is interested in U.S. investments in their infrastructure, including building more airports and expanding their deepwater port to be dual use between domestic maritime search and rescue needs and supporting U.S. national security interests. The U.S. once maintained a large footprint in Greenland during World War II and the Cold War, operating 17 bases in Greenland in World War II and the Cold War, which protected U.S. national security and ensured security to our NATO ally.

What investments in transportation infrastructure and technology would increase our defense capabilities in the region and could drive U.S. economic development in a growing strategic area?

Answer. On transportation infrastructure, expanding Greenland's deepwater port capacity is would provide important benefits for U.S. defense capabilities in the region. The existing port at Nuuk, while functional, lacks the depth and scale to handle large naval or commercial vessels efficiently. Upgrading it to a dual-use facility—supporting maritime search and rescue for Greenland while doubling as a U.S. military staging point—would enhance rapid response to Arctic incidents and provide a logistical hub for naval operations. Coupled with a new deepwater port in northwest Greenland, near Pituffik, where the U.S. already has a presence. A modern port there, capable of docking icebreakers and frigates, would extend operational reach across the GIUK Gap (Greenland-Iceland-UK), a chokepoint critical for countering Russian submarine activity. The Army Corps of Engineers has studied Arctic port feasibility before—Nome, Alaska, was a candidate—but Greenland's proximity to transatlantic routes gives it additional strategic benefits for countering our adversaries' activities near Greenland.

Airports are also critical. Greenland's current trio—Nuuk, Kangerlussuaq, and Narsarsuaq—handles limited traffic, with runways too short for heavy military transports like C–17s. Extending runways and adding all-weather capabilities,

which are important to function in the Arctic's extreme climate, would allow U.S. Air Force deployments and surveillance flights, bolstering domain awareness against Sino-Russian moves. A 2024 Danish plan to upgrade these airports with $2 billion offers a cost-sharing opportunity—U.S. investment could prioritize military specs, like hangars for F–35s or P–8 Poseidons, while supporting Greenland's civilian needs. A new airfield in the east, facing Iceland, could also monitor the Transpolar Sea Route, a potential future shipping lane as ice melts.

On technology, icebreakers are vital. Fast-tracking the Polar Security Cutter program—already budgeted at $11.6 billion for three heavy icebreakers—would ensure year-round access to Arctic waters, escorting naval assets and securing shipping lanes. These could also be equipped with anti-submarine warfare tech, like towed sonar arrays, to counter Russian subs in the region. Meanwhile, deploying long-range drones adapted for cold weather—off Greenland's upgraded airfields would extend surveillance over the Northwest Passage and Northern Sea Route, where China and Russia are staking claims.

Dual-use tech can drive economic gains too. Satellite networks, like Starlink, already being considered for Arctic use, could provide broadband to Greenland's 56,000 residents while feeding real-time data to U.S. forces. A fiber-optic cable linking Greenland to Alaska or Iceland, hardened against cyber threats, would boost local connectivity and secure military comms. These investments create jobs—construction, maintenance, tech support—while tapping Greenland's rare earth deposits (lithium, niobium) for U.S. supply chains, reducing reliance on China.

Question 2. The Navy and Coast Guard created an Integrated Program Office to build a new fleet of icebreakers, the first of which was supposed to be delivered in 2024. We still don't have a contract agreement and have yet to fully begin construction on the first ship in the class. The President has recently called for 40 icebreakers to be built.

What is the strategic value to the United States of having more icebreakers when our competitors have a combined 60 icebreakers?

Answer. The strategic value of the U.S. expanding its icebreaker fleet lies in countering their military dominance, securing economic opportunities, and reinforcing geopolitical clout in the Arctic, where ship traffic has spiked 37 percent in a decade. Russia's 40+ icebreakers (including nuclear-powered giants) and China's growing fleet enable year-round naval operations, resource extraction (like Yamal LNG), and control over routes like the Northern Sea Route, while the U.S. struggles with the aging Polar Star and Healy. More icebreakers, including heavy ones like the planned Polar Security Cutters would ensure naval access, protect American stakes in oil, gas, and rare earths, and signal resolve to NATO allies, offsetting rivals' numbers with quality deployment despite high costs.

Question 2a. Based on the recent exercises of the People's Liberation Army Navy and China Coast Guard operating with the Russian Federation Navy and Border Guard in the polar regions, what are the risks of the U.S. not meeting presence with presence in the Arctic regions?

Answer. The recent joint exercises between the China and Russia in the Arctic highlight a growing Sino-Russian alignment that threatens U.S. interests if not countered with a robust presence. Without matching this activity, the U.S. risks losing strategic influence over critical shipping lanes like the Northern Sea Route and access to resources. Failing to deploy an adequate U.S. presence in the region would embolden Moscow and Beijing to dominate the region, sidelining NATO allies and exposing the U.S. homeland to unchecked northern threats, as seen with joint bomber patrols near Alaska in July 2024.

Question 3. In recent years, China has declared themselves a "near-Arctic power" and begun increasing their capabilities for operating in the high latitudes. China's Polar Silk Road, the Arctic arm of the Belt and Road Initiative, aims to build shipping routes through the Arctic Ocean to connect Europe, Asia, and North America. China currently operates four icebreakers, with a fifth expected to be completed in 2025.

China's stated goal in the Arctic as a "near-Arctic power" is to create a Polar Silk Road and exploit the region's resources. How will this goal increase Chinese influence in the Arctic regions?

Answer. China's ambition to establish a Polar Silk Road as a self-proclaimed "near-Arctic power" aims to integrate the Arctic into its Belt and Road Initiative, leveraging the region's thawing shipping lanes—like the Northern Sea Route, which slashes Asia-Europe transit time by 40 percent—to boost trade and secure resource access. By deploying icebreakers like the Xuelong 2 and investing in infrastructure (*e.g.,* failed bids for Greenland airports in 2018), China seeks to lock in economic footholds, partnering with Russia to escort LNG tankers and develop ports like

Zarubino, near Vladivostok, for Arctic transshipment. This logistical edge amplifies Beijing's influence, letting it shape trade flows and potentially set de facto standards for navigation, sidelining Western powers like the U.S. Paired with joint naval exercises—such as the 2024 Bering Sea patrols—China's presence signals reliability to Arctic states, eroding U.S. and NATO sway over the region.

Resource exploitation further cements China's clout, targeting the Arctic's 13 percent of undiscovered oil, 30 percent of natural gas, and rare earths vital for tech dominance. Beijing's stakes in Russia's Yamal LNG (29.9 percent via state firms) and stalled $500 million investment in Greenland's Kvanefjeld mine show its intent to control supply chains, reducing reliance on Western sources while binding resource-rich states to its orbit. Scientific missions, like 14 expeditions since 1999, double as strategic mapping, enhancing China's leverage in forums like the Arctic Council, where it's an observer but pushes for more say. If unchecked, this economic penetration—backed by Russia's military muscle—could shift the Arctic's balance, leaving the U.S. scrambling to counter a entrenched Sino-Russian bloc in a region critical to global security and commerce.

Question 3a. How can the U.S. counter increasing Chinese influence in the Arctic regions?

Answer. The U.S. can countering Chinese influence in the region by seeking to align Greenland's self-stated objective of independence with U.S. interests. This could take several forms including the U.S. acquiring Greenland as a territory or negotiating a Compact of Free Association Agreement with Greenland which would allow the U.S. military unfettered access to the region as well as the right to deny foreign military transits or activity.

Question 4. Pituffik Space base was built in 1951 and provides installation support for vital space-based missions. It is home to the Department of Defense's northernmost deep-water port and has a 10,000-foot runway.

Considering the growing strategic threats to North America and the U.S. homeland, do you believe Pituffik, and the early warning capabilities located there, continue to remain critical to our national defense?

Answer. Yes, Pituffik Space Base remains critical to U.S. national defense, especially as strategic threats to North America escalate from Russia and China's Arctic ambitions. Its early warning systems, including the Upgraded Early Warning Radar (UEWR) tied to the Missile Defense Agency, provide unmatched detection of ballistic missile launches and space threats across the polar region—vital against Russia's hypersonic missile tests (*e.g.,* Zircon in 2023) and joint Sino-Russian bomber patrols near Alaska in July 2024. Positioned 750 miles above the Arctic Circle, Pituffik's line-of-sight advantage over the northern approaches fills a gap no CONUS-based radar can, while its proximity to the GIUK Gap aids tracking Russian subs. As China's Polar Silk Road and Russia's militarization intensify competition, Pituffik's role in domain awareness and deterrence—backed by its Cold War legacy of 17 U.S. bases in Greenland—ensures it's a linchpin for homeland security, especially with Arctic traffic up.

Question 4a. Do you believe the U.S. has made sufficient investments in these capabilities to pace rapidly evolving strategic missile threats?

Answer. The U.S. has not made sufficient investments in Pituffik's early warning capabilities to keep pace with rapidly evolving strategic missile threats, particularly from Russia's hypersonic arsenal and China's expanding missile tech. While the Upgraded Early Warning Radar (UEWR) at Pituffik, part of a $1.5 billion modernization from 2005–2017, can detect ballistic missiles, it continues to struggle against hypersonics like Russia's Zircon or Avangard, which travel at Mach 10+ with unpredictable trajectories—capabilities the GAO warned in 2022 outstrip legacy radar sensitivity. Funding for next-gen sensors, like the Long Range Discrimination Radar (LRDR), has prioritized Alaska over Greenland, leaving Pituffik's upgrades incremental rather than transformative, despite a 2024 Pentagon budget of $9.1 billion for missile defense. The lack of robust investment for hypersonic-specific radar and space-based tracking risks blinding the U.S. to threats over the polar cap, where Pituffik's strategic perch remains underutilized.

RESPONSE TO WRITTEN QUESTION SUBMITTED BY HON. DAN SULLIVAN TO ALEXANDER B. GRAY

Question. Both Alaska and Greenland are strategic gateways to the Central Arctic Ocean, a high seas area beyond national jurisdiction. In the 110th Congress, Senator Stevens, through *Senate Joint Resolution 17,* led national efforts to negotiate the Central Arctic Ocean fisheries agreement, which was taken up by the President

George W. Bush Administration and signed by the first Trump Administration. Can you reflect on additional, innovative ways for the U.S. to project its national interests in the Central Arctic Ocean?

Answer. The U.S. could explore a forward-leaning security posture through non-military means, such as expanding Coast Guard-led joint exercises in the CAO. Equipping polar security cutters with modular research and rescue capabilities would project presence without provocation, enhancing safety for emerging shipping routes while subtly reinforcing U.S. sovereignty interests tied to Alaska and proximity to Greenland. Partnering with NATO allies like Canada and Denmark for these missions could amplify their impact, fostering a rules-based order amid growing transpolar route speculation.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. JACKY ROSEN TO ANTHONY MARCHESE

Since the passage of the Inflation Reduction Act, Bipartisan Infrastructure Law, and CHIPS and Science Act, demand for critical minerals and rare earth elements has only continued to grow. However, our reliance on foreign adversaries for these key materials is a significant threat to our national security. Mining right here at home can secure our supply chains; support U.S. manufacturing, energy, infrastructure, and national security needs; and create good-paying jobs. Before we look abroad, we need to prioritize and build on the investments we've already made in the mining supply chain and in communities across the U.S., including in Nevada.

Question 1. Do you agree that the U.S. is rich with untapped natural resources that are waiting to be unlocked?

Answer. The United States most definitely has untapped resources with respect to critical minerals. Even if the currently planned projects were to come to fruition, that would only satisfy a tiny portion of the world demand. Let's also remember that we have domestic content laws in the USA that date back to the 1930s which would insure that anything we produce domestically would be absorbed by products that would go the Federal government and would therefore be subject to domestic content requirements.

Question 2. Do you agree that there are barriers to mining here at home that we need to address?

Answer. There are several barriers domestically that need to be addressed. Fortunately capital is not one of them. If certain barriers are addressed there would be no lack of capital to fund economic projects. The first barrier is the permitting process, which unfortunately can be quite burdensome and lengthy, hence the astronomical costs. Remember that time=money. Having both the U.S. Forestry Service and Bureau of Land Management govern the licensing pathway on Federal lands can often times result in licensing timetables often approaching ten years. Add to that the various environmental regulations of the EPA and you have many projects that die simply because people lose patience (and money). The USA has some of the strictest mining regulations in the world and unfortunately the domestic NGO's are able to delay or kill projects by intentionally extending things like public comment periods and frivolous lawsuits. An additional barrier is the lack of financial incentives for upstream development. The U.S. Government at the present time will not provide any incentives for companies to discover and begin to develop greenfield projects. Money is only available for downstream mineral processing.

Question 3. We have robust reserves in the U.S. and concurrently, have barriers that prevent companies from accessing them. If we shift our focus to Greenland—a territory expected to have smaller reserves and additional barriers—I'm concerned that we're going to eliminate jobs here at home and shrink this critical domestic industry, rather than help it grow. How do we address the real challenges we have within our domestic supply chain?

Answer. It will take a significant amount of time to identify, explore and fund projects in Greenland. At least 10–20 years given the physical and potential environmental barriers in the region. Focusing on Greenland actually may have the effect of focusing attention on domestic opportunities in the United States.

Question 4. What can we be doing to bolster our domestic mining industry, including its workforce, to support companies here at home?

Answer. The United States should move to a central licensing authority for the mining industry, as they successfully do in Australia. Having multiple licensing authorities and environmental agencies review different projects in different parts of the country is highly inefficient and leads to the potential for politically based decisions by region. Secondly, the USA needs to provide financial incentives for up-

stream mine development. It does no good to incentive mineral processing without simultaneously incentivizing mining discovery. The USA could also incentive project development by providing tax incentives for the early stages of production in order for companies to recoup project costs faster. As an example, create a Federal tax moratorium for the first 5 years of production.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. ROGER WICKER TO DR. JENNIFER MERCER

The Navy and Coast Guard created an Integrated Program Office to build a new fleet of icebreakers, the first of which was supposed to be delivered in 2024. We still don't have a contract agreement and have yet to fully begin construction on the first ship in the class. The President has recently called for 40 icebreakers to be built.

Question 1. What is the strategic value to the United States of having more icebreakers when our competitors have a combined 60 icebreakers?

Answer. The strategic value of having more icebreakers provides flexibility and redundancy to still pursue U.S. Arctic interests (national security, homeland security, economic security, and scientific) when the Nation's sole icebreaker is unavailable to meet operational requirements. Given the vast expanse of the Arctic, not all of the Nation's strategic Arctic imperatives can be attained, realized, and sustained by having only one Arctic icebreaker. From a scientific perspective, icebreakers are critical for maintaining research aimed at understanding the new more accessible Arctic—one that supports much more human activity than it did previously. Scientific research that takes place aboard U.S. icebreakers in the Arctic is made possible by close collaboration between NSF and the USCG where NSF funds and facilitates both the scientific personnel and instrumentation aboard the USCGC Healy. USCGC *Healy* operates primarily in the Arctic to support scientific research, enhance maritime domain awareness, and counter adversary presence. Following a 2024 fire on board USCGC *Healy* that interrupted a patrol, temporary repairs were completed. Full repairs are expected to be completed in May and the cutter will continue to support all missions, including science missions, beginning in summer 2025. Research will include assessments of the newly accessible seabed to understand navigability and support of exploration of the U.S. continental shelf for natural resources including minerals. Icebreakers support seafloor mapping and characterization with onboard instrumentation and through deployment and recovery of autonomous vehicles and observing systems. Another critical research need is the development of robust U.S. produced scientific research on which to base fisheries decisions related to the Central Arctic Ocean Fisheries Agreement. More medium icebreakers, such as the Healy, are needed to provide more presence in the Arctic and carry out these important scientific missions.

Question 2. Based on the recent exercises of the People's Liberation Army Navy and China Coast Guard operating with the Russian Federation Navy and Border Guard in the polar regions, what are the risks of the U.S. not meeting presence with presence in the Arctic regions?

Answer. NSF provides the research infrastructure and funds the research in the Arctic region for U.S. researchers to continue to maintain U.S. scientific leadership globally. In addition to global scientific leadership, this provides U.S. presence throughout the Arctic and ensures that our knowledge of the Arctic does not lag behind that of other nations. Science in the polar regions is often referred to as "soft security," an important component of national security. The risk is that any void left by NSF and other U.S. government presence will likely be filled by our adversaries. Our retreat from the Arctic region would lead not only to their presence but to the greater scientific dominance of China and other countries of concern. As the Chinese government compels its researchers to subvert the scientific norms of transparency and fair competition, the results of the China-funded research are often not available to U.S. scientists, further eroding U.S. capability to advance knowledge, innovation, and benefit. Constant presence provided by more U.S. icebreakers is needed to conduct our own research and maintain scientific dominance.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. ROGER WICKER TO DR. REBECCA PINCUS

The Navy and Coast Guard created an Integrated Program Office to build a new fleet of icebreakers, the first of which was supposed to be delivered in 2024. We still don't have a contract agreement and have yet to fully begin construction on the first ship in the class. The President has recently called for 40 icebreakers to be built.

Question 1. What is the strategic value to the United States of having more icebreakers when our competitors have a combined 60 icebreakers?

Answer. The U.S. icebreaker fleet is at a low point in its history. The POLAR STAR is 52, well past its planned operational lifespan, and the HEALY is 28. The recently acquired STORIS will require significant overhauls to reach full operational capacity, and questions about its suitability for mission continue to percolate [1].

The diminishment of the U.S. icebreaker fleet is apparent, and it is not surprising that U.S. competitors are taking advantage of this situation to apply pressure at a U.S. weak point. For example, China has leveraged its world-leading shipbuilding capacity to build a small fleet of research icebreakers, including the XUE LONG 2, the JI DI, and the TAN SOU SAN HAO11, which it regularly sends into the Arctic Ocean on scientific research missions that are very likely also intelligence collection opportunities.

In terms of policy, the U.S. has clearly articulated an intent to "assert a more active and influential presence to protect its Arctic interests and to project sea power throughout the region." [2] This language, from the 2009 National Security Presidential Directive (NSPD) 66, signed by President Bush, has been largely carried forward by successive presidential administrations.

Icebreakers are a means to the end of greater presence. Their value to the U.S. is in their ability to help accomplish strategic objectives. Without an icebreaker fleet that is fit to purpose, the U.S. will fail to accomplish its Arctic strategy. Over the longer and broader term, this strategic failure may have second-order effects in other theaters and/or strategic domains.

Question 2. Based on the recent exercises of the People's Liberation Army Navy and China Coast Guard operating with the Russian Federation Navy and Border Guard in the polar regions, what are the risks of the U.S. not meeting presence with presence in the Arctic regions?

Answer. It is not surprising that U.S. competitors are exploiting what they perceive as a weak point. While the operational value of these exercises is limited, they send an unmistakable signal and carry symbolic effect. By conducting joint exercises in and adjacent to the Arctic, China and Russia signal their close military relationship, and regional presence and proficiency. Unless and until U.S. surface presence in the Bering Sea is strengthened, it is likely that these signals and exercises will continue.

RESPONSE TO WRITTEN QUESTION SUBMITTED BY HON. DAN SULLIVAN TO DR. REBECCA PINCUS

Question. Both Alaska and Greenland are strategic gateways to the Central Arctic Ocean, a high seas area beyond national jurisdiction. In the 110th Congress, Senator Stevens, through *Senate Joint Resolution 17,* led national efforts to negotiate the Central Arctic Ocean fisheries agreement, which was taken up by the President George W. Bush Administration and signed by the first Trump Administration. Can you reflect on additional, innovative ways for the U.S. to project its national interests in the Central Arctic Ocean?

Answer. The Central Arctic Ocean (CAO) comprises approximately 1.1 million square miles of high seas area, adjacent to Alaska's coastal seas: the Beaufort, Chukchi, and Bering, as well as coastal seas of the other Arctic coastal states. Historically characterized by the presence of sea ice, the CAO in recent years has seen significant declines in ice coverage across three measures: temporal duration of ice coverage, geographic extent of ice, and volume or thickness of ice. While the CAO remains under ice in the winter, late summer observations have found up to 40 percent open water.

The CAO fisheries agreement stands as a successful example of an international instrument tailored by the U.S. to project our interests into international waters just beyond our borders. Its proactive initiation and ultimate acceptance by ten countries, including China, Russia, and the EU, reflect an efficient and pragmatic approach to an emerging problem. Given ongoing limitations for the U.S. in terms of domain awareness and operational presence in the Arctic and CAO, such a proactive approach appears well-aligned to capabilities and resources.

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[1] For example, see Pro Publica's recent investigation: McKenzie Funk, "This Icebreaker has design problems and a history of failure. It's America's latest military vessel." *Pro Publica,* Jan. 23, 2025. How a Troubled Icebreaker Became America's Newest Military Vessel—ProPublica.

[2] National Security Presidential Directive 66/Homeland Security Presidential Directive 25 on Arctic Region Policy. Jan. 9. 2009. NSPD-66 on Arctic Region Policy.

The CAO fisheries agreement model could potentially be applied to protect other U.S. national interests in the CAO, including complex emerging issues around seabed mining and transpolar shipping. Proactive engagement at this early stage may help ensure U.S. interests are part of both problem definition and policy solution stages.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. JACKY ROSEN TO DR. REBECCA PINCUS

The Arctic's strategic environment is rapidly undergoing profound changes. Foremost among those is the People's Republic of China's (PRC) increasing involvement in the region. In recent years, the PRC has ramped up scientific and research projects in the Arctic. The PRC is also looking to establish economic ties within the region, and perhaps most concerning is the PRC's deepening of its Arctic collaboration with Russia—both in the commercial and military domains.

Question 1. Dr. Pincus, this new threat environment requires close collaboration with our allies and partners in the region, who are critical to preserving the Arctic as a region of stability and security. How do you think our Arctic partners would perceive the unilateral acquisition of Greenland by the U.S.? And in that same vein, how do you think the U.S. would view the unilateral acquisition of Greenland by one of our allies or partners?

Answer. NATO Allies and partners have long preferred to work through and via multilateral modalities. For 200 years, since the enunciation of the Monroe Doctrine, the U.S. has opposed any intervention in the western hemisphere by outside states.

Question 2. How might the PRC take advantage of any rifts unilateral action by the U.S. would cause?

Answer. I would defer to experts in China's foreign relations on this potential scenario.

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