

The United States' Role in Maritime Transportation in the Arctic

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Maritime Transportation.

Thank you, Chairman Hunter, Ranking Member Garamendi and distinguished members of the Subcommittee, for the opportunity to present today. This is a privilege to come before you today at this hearing and discuss this very important topic.

I am David Titley and currently serve as the Founding Director of the Center for Solutions to Weather and Climate Risk at the Pennsylvania State University. I also hold appointments as a Professor of Practice in Meteorology and a Professor of International Affairs. I had the privilege of serving in the United States Navy for 32 years and retired in 2012 as a Rear Admiral and Assistant Deputy Chief of Naval Operations for Information Dominance. When I retired, I was also the Oceanographer and Navigator of the Navy, and Director of U.S. Navy Task Force Climate Change. Subsequent to my time in the Navy, I served as the Chief Operating Officer position of the National Oceanic and Atmospheric Administration (NOAA). I serve on the Board of Directors for the Council on Strategic Risks, the Advisory Board of the Center for Climate & Security. I am a member of the CNA Military Advisory Board and Hoover Institution's Arctic Initiative. My Center at Penn State currently receives no government or private sector funding; my views today are my own. I am here today because I believe it's important to discuss the challenges to our nation's security posed by a changing climate, particularly in the Arctic. Thank you for holding this hearing.

In the Navy we have a saying, to just give me the 'Bottom Line Up Front' or BLUF. So here's my BLUF for today's hearing:

- **The Arctic's physical environment is changing faster than any other place on Earth today:** Today's Arctic climate continues to warm at a rate twice that of the rest of the world. Temperatures at the North Pole the past three years have reached the freezing point – in the middle of winter. Prior to 2016, this was virtually unheard of. While these days make headlines – especially when it's colder in Washington than at the North Pole – the real news is how much less cold there is in the Arctic relative to even 30 years ago. Over the past three winters, most of the central Arctic has been 5 to 7 degrees Fahrenheit warmer than normal. To put this into comparison: that much warming in Washington DC would make the winters here more like those in North Carolina.

One of the many effects of this tremendous warming has been to thin the ice. 30 years ago, there was nearly as much old hard thick ice (scientists call it ‘multiyear ice’) as there was first year ice. Now nearly 80% of the ice you see in any picture of the Arctic is softer, thinner first year ice, and only 20% of the ice has lasted for more than one year. So the Arctic sea-ice is changing in two ways: it’s not only decreasing in extent, losing over 13% each decade each September, but it is also rapidly thinning. Combined, these changes lead to a much more variable, dynamic ice pack that will make maritime transportation more tempting, more feasible – and paradoxically more hazardous due to rapidly changing and less predictable conditions.

- **Our rivals are paying close attention to the changing Arctic, even if we are not:** While the United States has shown, at best, sporadic and episodic interest in the Arctic, our great power rivals, as defined in our National Security Strategy, have made deliberate investments in planning and resources. The Russians are actively monetizing their Northern Sea Route and rebuilding their Arctic military capabilities, albeit from a very low post-cold war level. After western sanctions were imposed following Russian actions in Crimea and the Ukraine, Russia has courted Chinese investment for their fossil fuel industry. China meanwhile released its Arctic Strategy in January of this year. China declares itself to be a “near Arctic State” and hopes to jointly build a “Polar Silk Road” – likely the Northern Sea Route -- as the northern flank in its “Belt and Road” initiative. China continues to court the Nordic states and Greenland, likely looking for a combination of natural resources and an Atlantic terminus to any future trans-polar shipping route.
- **There is still time to execute a deliberate strategy that will assert our economic and security interests, assure our allies, and ensure we are ready for the future that will be very different than the past:** In May 2009, at the direction of then Chief of Naval Operations Admiral Gary Roughead, I initiated and led the U.S. Navy Task Force on Climate Change. The U.S. Navy started this task force, not in response to any perceived political pressure, but as a reaction to the collapse of sea-ice in the Arctic in the summer of 2007. Admiral Roughead asked me to assess the conditions in the Arctic, and provide him with recommendations for the Navy’s response. My conclusions were that the sea-ice collapse in the Arctic, well ahead of most of the computer models of the time, was the leading edge of climate changes to come that would change the operating environment for the Navy. The goal of Task Force Climate Change was to prepare, in a deliberate manner, the U.S. Navy for this future environment, with an emphasis on getting ready for the Arctic, as it was the change that would likely impact the Navy first. In 2009 I characterized the Arctic as “a challenge but not a crisis”. However I said if we ignored changes in the Arctic or were slow to respond, we heighten the risk of the region becoming a crisis. We need to address the Arctic taking a “system of systems” approach. We need to address our security, economic, scientific and certainly social issues in the Arctic, while simultaneously understanding the motives and intentions of Russia and China and assuring our allies and friends.

Security Issues in the Arctic

Over the past decade in the Arctic, we have seen an exponential rise in human activity in and around the Arctic; more shipping, more resource extraction and more posturing, particularly by our great power rivals, for control and influence over today's resources today and tomorrow's sea lines of communication. The world is not yet prepared to respond to an major accident that could occur with increasing shipping and energy exploration in this fragile region with limited infrastructure and extreme operating conditions. Although there are a number of Arctic strategies and roadmaps at the national, cabinet and agency level, most are seriously under-resourced, or have little apparent impact on either policy or budget priorities. Preparations for energy exploration are well underway and when oil prices rise, as they always do, the Arctic will be a tempting and economically viable area for exploitation. We assess that today we do not have the communications equipment, navigation aids, and sufficient ice hardened ships to respond to natural or manmade disasters in that fragile area or to protect our vital interests. In other words, we are not prepared in the short term for the rate of increase and we must invest today in increasing our capability and capacity.

This increase in Arctic human activity is playing out on a backdrop of increasingly assertive Russian activity in the Arctic. While the Russians maintain their military buildup in the High North is peaceful and for defensive purposes only, it is impossible for us, our NATO allies, and our partners to ignore the aggressive operations of Russian forces in that part of the world and their high-readiness, no-notice snap exercises¹. Regardless of intent, Russian forces have, over the past few years, significantly upgraded the ability to operate and command and control forces in the Arctic. Their actions are disconcerting to our allies; we would be remiss to completely ignore this change in security dynamics.

Shipping Issues in the Arctic

At the risk of duplicating what my fellow witnesses and colleagues might say, it's important to outline the many challenges that arise for any arctic maritime transportation operations today or for the next couple of decades, at least. The old Facebook status said it best: "it's complicated".

- It's cold and austere. Yes, the temperatures are warming in the arctic and the ice is melting at unprecedented rates. However, it can still be very cold (-30 degrees) in the winter and very foggy in the summer. It's dark for many months in the wintertime. As the ice thins and breaks up it becomes even more difficult to predict. Thick ice can be like hurricanes: it only takes one to ruin your whole day. Shell found this out to their chagrin in 2012. While the Arctic as a whole experienced record-low sea ice that year, relatively small pieces of multi-year ice floated into the Chukchi Sea and disrupted their offshore operations.
- There is much work still to do charting safe passages and routes for arctic shipping. I'm pleased to note some of this work is underway, with NOAA ship surveys and the Bering

¹ K. Zysk, and D.W. Titley. "Signals, Noise and Swans in Today's Arctic." *The SAIS Review of International Affairs*, 25 (1) 169-181, 2015.

Sea Traffic Separation Scheme that will come into effect this December. However, much of the Arctic Ocean has yet to be surveyed to modern standards.

- If you get in trouble, you may be on your own. Although the Arctic Council has led the implementation of both a Search & Rescue and a Marine Oil Spill Agreements, it's one thing to have a signed agreement, and another to have the resources and training (we would call this 'readiness' in the military) to be able to respond effectively when the call comes.
- The combined impacts of the above-listed bullets give shippers, and more importantly, insurers, pause when running shipping through the Arctic.
- The current routes available for navigating across the Arctic, that is the Northern Sea Route across Russia's coast and the Northwest Passage through the Canadian archipelago, have significant draft limitations for modern commercial shipping. The Northwest Passage is also a technically demanding navigation detail, particularly in waters subjected to high winds, poor visibility, and rapidly varying and unpredictable ice conditions.
- Both Canada and Russia claim parts of their respective sea routes through the Arctic as 'internal waters'. While the U.S. does not recognize these claims, the lack of agreement in governance of specific waters adds uncertainty to any risk equation.
- The current business model of the container fleets stresses both reliability of delivery date and shipping very large numbers of containers to reduce fixed costs. As of today, and likely for the next 10-20 years, those constraints will continue. Once a seasonally ice-free trans-arctic route opens up, most probably sometime in the 2030's, these conditions might change.
- We should always be aware of the potential for disruptive change. The liquefied natural gas (LNG) carrier *Christophe de Margerie* class of ships set a transit speed record for a commercial ship across the Northern Sea Route last August. Another ship in the class transited the Northern Sea Route this past February with no icebreaker assistance. While there are good technical reasons to believe these are 'one of' events – many revolutions are not recognized until they are well underway.

Recommendations

So what should we do? I recommend we take a risk-management approach, similar to how the CNA Military Advisory Board (MAB) has done in their most recent report on the risks of climate change to security.² Although most of the CNA MAB members are not scientists, their positions as former senior three- and four-star leaders in the United States Military trained them to seek and assess technical advice from many different fields of expertise.

It's important we step back and consider the obvious: we have never been in a position in the modern world where access to an entire ocean opened up within a matter of decades. While we tend to think that the days of geographic exploration ended in the 18th and 19th Centuries, in many aspects, the changes in the Arctic will likely create a wave of human exploration and

² "National Security and the Accelerating Risks of Climate Change.", CNA Corporation, May 2014. https://www.cna.org/cna_files/pdf/MAB_5-8-14.pdf

activity. Now is the time to think carefully about how to manage that very different world and what we want that world to look like. We must think of this in terms of our security, our economy, the likely actions of our friends and rivals, and critically, engage in a meaningful and sustained way with the indigenous people who have lived in the arctic for thousands of years. While many of these recommendations are similar to what I published with Elizabeth Rosenberg 2 ½ years ago³, they are still relevant today:

- **Update our Nation’s Arctic Strategy in response to the changes in our National Security Strategy and National Defense Strategy**
 - Use all our sovereign assets (DOD, DHS, Navy, Coast Guard, NOAA) to develop a coherent and sustainable presence in the Arctic that will demonstrate long-term commitment to our sovereign interests in the Arctic, reassure our Allies, and send an unmistakable message to our great power rivals that as an Arctic Nation, we will neither ignore nor neglect this strategic region.
 - Direct and resource the National Science Foundation to set up a permanent research presence on Svalbard. Both the Russians and Chinese have a presence on the island, but the U.S. does not. I am very confident our Norwegian friends would welcome a permanent U.S. research presence on Svalbard, under the auspices of the 1920 Treaty of Svalbard.
 - Adequately resource the U.S. Coast Guard to construct and operate a new class of heavy icebreakers that will be the foundation of U.S. maritime presence in the Arctic.
 - Reengage with our allies on Arctic exercises. The U.S. Navy sent a guided missile destroyer to the Canadian Exercise NANOOK in 2010, but has not done so since, primarily for budget reasons and the lack of available surface assets. There are valuable lessons learned and experience gained by operating with our partners in the Arctic and High North. We should not let the urgent crowd out the strategically important when allocating assets.
 - Commit to ‘Arctic Domain Awareness’ to ensure we understand who and what is operating in the Arctic, what the trends are, and to keep our borders safe and protected.
- **Develop – and resource – a plan that in conjunction with state, Native Alaskan corporations, allied, and private sector interests, builds out the foundations of an infrastructure that can support U.S. objectives for a seasonally ice-free Arctic.**
 - Ice predictions need to be improved on all time scales from daily to seasonal to multi-year outlooks. The Department of the Navy is funding today the ‘Earth System Prediction Capability’ or ESPC – an interagency program designed to provide our country the next-generation of integrated air-ocean-ice-land prediction system⁴. Navy is working with other components of the DoD, as well

³ E. Rosenberg, D. W. Titley and A. Wicker. Arctic 2015 and Beyond: A Strategy for U.S. Leadership in the High North. *Center for New American Security*, December 2014
https://s3.amazonaws.com/files.cnas.org/documents/CNAS_ArcticHighNorth_policybrief_RosenbergTitleyWiker.pdf?mtime=20160906080459

⁴ <http://espc.oar.noaa.gov/>

as NOAA, NASA and the Department of Energy to ensure our nation has the world's best operational weather and climate prediction tools at our disposal. This national imperative must be a national priority. I want to thank the Congress for including language in the 'Weather Research and Forecasting Innovation Act of 2017' that directs NOAA to cooperate with the DoD on further developing ESPC.

- Weather forecasts in the Arctic are still significantly less accurate than those we produce for the lower 48. For both safety and economic reasons, this needs to change.
- We need to continue to map the U.S. Arctic Exclusive Economic Zone (EEZ) waters to support safe maritime navigation and operations as well as gathering data and knowledge for optimal and sustainable ecosystem management.
- We must address the lack of ports north of the Bering Strait and lack of permanent infrastructure for safety assets, such as Search and Rescue or Oil Spill response ships and aircraft. This should be done in conjunction with partnerships of state and indigenous stakeholders, as well as in close coordination with our Canadian allies.
- **Commit to ratification of the UN Convention of the Law of the Sea (UNCLOS).** UNCLOS was written primarily by the U.S. to encode maritime advantages inherent to our economic and security well-being. UNCLOS is the governance structure for the world's oceans, including the Arctic Ocean. Accession to UNCLOS, among many other advantages, would allow the U.S. to file a claim for seabed resources north of Alaska in an area that is nearly the size of California.
- **Continually adjust policies today based on what we learn** – and for what we might reasonably expect in the coming decades. Ensure we do not simply plan for the best case or even the most likely, but also consider seriously less likely scenarios that pose either great challenges – or great opportunities – to the U.S. We learned in the military a long time ago that hope by itself is rarely a good strategy.

In closing, our country is dealing with a significant change in the world's climate, and nowhere is the climate changing faster than in the Arctic. Our country has met challenges of this magnitude before and succeeded – and we will do so again. While we don't know everything – and we never will – we do know more than enough to act now. By focusing our efforts in a risk-based framework on meeting the challenges of a rapidly changing Arctic, we can prepare for the short-term while shaping our longer-term future. We can provide the policies that give our country security, access and stability to this region of ever-increasing strategic importance. I am convinced that, with focus and sustained leadership, we will be proud and amazed at what we can accomplish in the Arctic.

Thank you very much for your time and attention; I look forward to taking your questions.