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FIVE POTENTIAL MYTHS ABOUT THE FUTURE OF THE ARCTIC

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ABSTRACT

Until recently, the Arctic has received little attention from the global audience. Most people assume change will come slowly and will be managed by the international community. This article explores how the following common assumptions could prove wrong with significant consequences for the globe: (a) ice melt will not pose serious problems for decades; (b) carbon dioxide is the primary threat to global warming; (c) nation-states will determine who controls Arctic land and waters; (d) the Arctic will be governed much in the same way as the Antarctic; and (e) the Gulf Stream will continue to channel warm air to Europe.

Keywords: *Arctic, structured analytic techniques*

INTRODUCTION

The future of the Arctic has received little attention from much of the global audience until recently. When asked about the Arctic, the usual replies are: "It is a vast and snowy wasteland" or "The ice is melting, but dramatic change is not likely for decades." Most people are unaware that countries disagree over who owns portions of the Arctic or that Russia has established a significant military presence there. This article examines five common assumptions about the Arctic and explores whether they will prove false. The five myths are:

1. The ice is melting slowly, and the change will be gradual.
2. Carbon dioxide poses the primary threat to global warming and the melting of sea ice.
3. Nation-states and international agreements will determine who controls the Arctic.
4. The Arctic will be governed just like the Antarctic.
5. The Gulf Stream will continue to warm the air over northern Europe.

METHODOLOGY

The *Key Assumption Check* is an exercise that explicitly lists and challenges the key working assumptions that underlie the basic analysis. The technique safeguards an analyst against several classic mental mistakes, including overdrawing conclusions, giving too much weight to first impressions, and failing to address the absence of evidence. Preparing a list of key assumptions helps analysts: identify the key assumptions or "common wisdom" that underlies the basic analytic line; achieve a better understanding of the most important dynamics at play; establish

what developments would call a key assumption into question; and avoid surprise should new information or events render old assumptions invalid.

The process is straightforward: brainstorm a list of assumptions critically; examine each assumption and ask whether you could wake up tomorrow and learn that an assumption was invalid; place each assumption in one of three categories: solid, correct with some caveats, or unsupported; and consider what impact the unsupported assumptions or "key uncertainties" would have on the analysis if proven untrue.

KEY FINDINGS

A critical examination of the five assumptions suggests that all of them are unsupported. The earth is not behaving as previously predicted, change is coming faster than anticipated, and new scientific information is emerging that requires us to reevaluate past projections.

Assumption 1: Melting Ice in the Arctic Will Not Be an Issue for Decades

Arctic ice is melting far faster than projected. As the ice thins, it reflects less sunlight, increasing the warming of the ice and water below it, generating a vicious feedback loop. From 1971 to 2019, the Arctic's average annual temperature rose by 3.1°C (37.6°C), compared to 1°C (33.8°C) for the planet as a whole (Deshayes, 2021). Since 2004, warming has continued at a rate of 30% higher than in previous decades. 2021 satellite imagery shows the ground temperature in one location in Siberia topped 48°C (118°F) (Shultz, 2021).

The Greenland icecap is melting so rapidly that in just one day in August 2021, temperatures rose to a record 20°C (68°F), flowing enough water into the Atlantic Ocean to cover the entirety of Florida in two inches of water (Milman, 2021). The North Pole is projected to see completely ice-free summers by 2030. The loss of sea ice since 1979 is equivalent to about ten times the size of the state of Arizona (National Snow and Ice Data Center, 2021). Taking a long view, the *Washington Post* reports that Greenland could lose 35,900 billion tons of ice by 2100, raising sea levels three feet (Bledsoe, 2021b).

Assumption 2: CO2 Poses the Greatest Threat to the Warming in the Arctic.

Most of the debate over climate change has focused on the need to contain the generation of CO2, but methane—another invisible, odorless gas—may pose a more significant threat. Methane is one of the most potent greenhouse gases; it has 80 times more warming power than CO2 (Ramirez, 2021; Bledsoe, 2021a).

In the United States, most methane is generated in landfills (17%) or from livestock (27%) and the oil and gas industry (32%) (Environmental Protection Agency [EPA], 2022). Methane leaks from millions of abandoned oil and gas wells, two million miles of gas pipelines, and thousands of active gas wells and refineries. The U.S. Energy Information Administration (2021) estimates that the oil and gas industry could reduce methane emissions by 75% using existing technology.

In addition, the decline in sea ice is accelerating methane emissions from 5–7 million square miles of Arctic permafrost and tundra. Permafrost warming now threatens 120,000 buildings and 25,000 miles of roads (Environmental Protection Agency, 2022). Recent studies show that frozen methane deposits in the Arctic Ocean are being released along large portions of the East Siberian coast, speeding the impact of global warming (Watts, 2020).

In an interview given by the lead author of the 2022 Intergovernmental Panel on Climate Change report, Charles Koven said that the fastest way to mitigate the impact of climate change is to reduce methane emissions (Intergovernmental Panel on Climate Change, 2022).

Assumption 3: Nation-States Will Continue to Control the Arctic

The eight states that border the Arctic—Russia, Canada, the United States, Iceland, Finland, Sweden, Norway, and Greenland (Denmark)—have conflicting territorial claims (see Figure 1). Russia, for example, has warned that countries could be at war within a decade over resources in the Arctic region (Rainwater, 2013).

- The Russians claim dominion over the underwater Lomonosov Ridge, a feature that spans a considerable distance across the center of the Arctic Ocean (France Diplomacy, 2016).
- Since the United States has not ratified the Convention of the Law of the Sea, it cannot engage in the process of extending its jurisdiction into the Arctic Ocean (United Nations, 2016).

Russian President Putin stated that Russia will "maintain the role of leading Arctic power." (Heininen et al., 2014) Russia has 18 fully operating bases along its Arctic coastline (see Figure 2) (Strategic Studies Institute, 2011). It has 40 icebreakers and 11 under construction. Several super icebreakers will be added to the fleet to break through 10 feet of Arctic ice year-round (Pherson, 2021).

Figure 1. Conflicting Territorial Claims in the Arctic

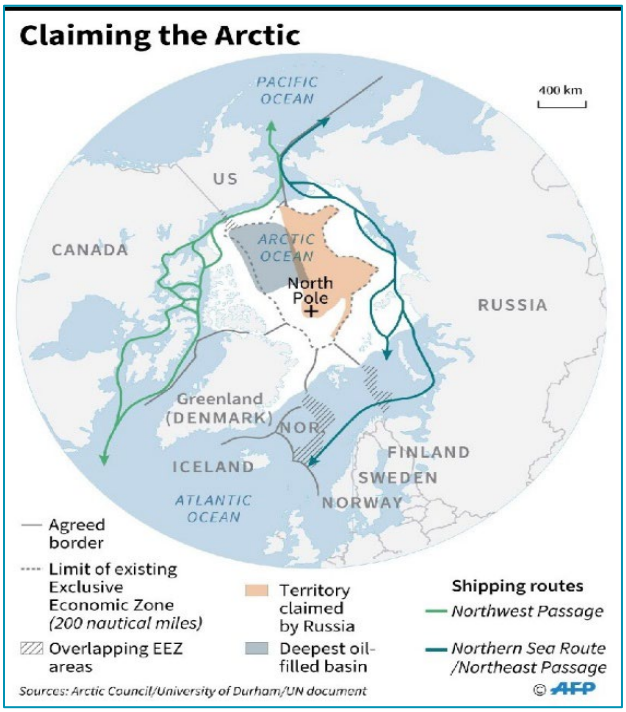
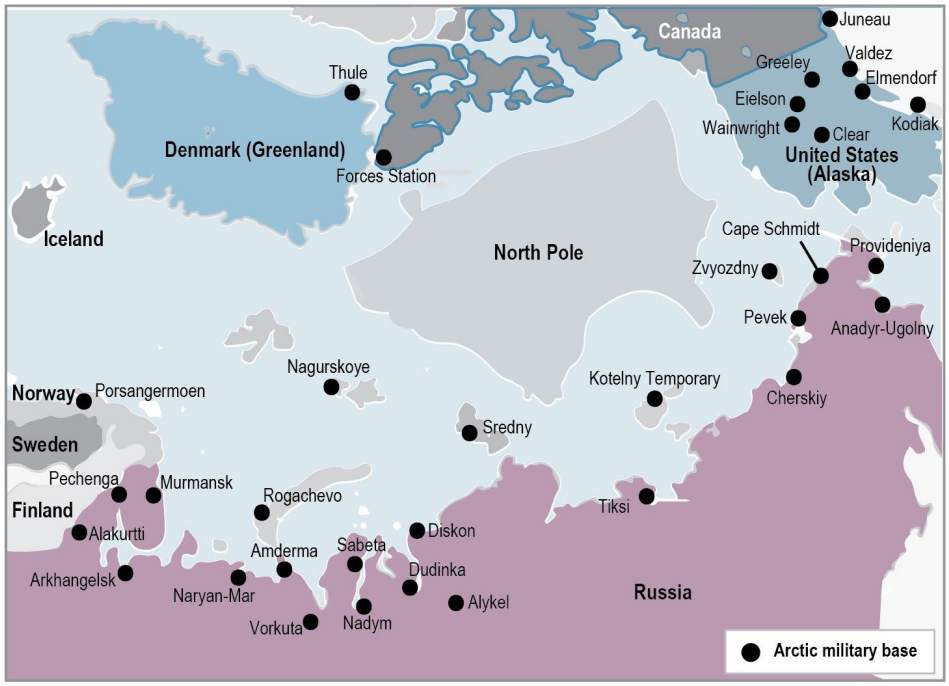


Figure 2. Russia's Militarization of the Arctic



Assumption 4: The Arctic Will Be Governed Like the Antarctic

The presence of natural resources is more likely to spark conflict than cooperation in the Arctic. Ice melting gradually exposes natural resources to commercial exploitation (Polar Portal, 2014). Human activity, including shipping, mining, energy exploration, fishing, and tourism, has increased in the Arctic by almost 400% over the last decade (Lloyds of London, 2012). According to a 2008 U.S. Geological Survey, the Arctic is estimated to contain about 90 billion barrels of oil, or potentially 13% of the world's oil reserves (Bird et al., 2008). About 41% of this oil is projected to be in the Russian Arctic Zone and over one quadrillion cubic feet of undiscovered natural gas—or some 70% of all Arctic natural gas (Lindhold & Glomsrod, 2011).

By contrast, Antarctica has few natural resources and is primarily a target for scientific research and tourism. The Antarctic Treaty, which came into effect in 1961 and has been signed by 52 states, dedicates the region to scientific investigation and asserts that Antarctica is to be used for peaceful purposes only. In a 1991 protocol, 24 states agreed to ban oil and other mineral exploitation there until at least 2048 (Cool Antarctica, n.d.).

Assumption 5: The Gulf Stream will continue to warm Europe

The Gulf Stream (part of the Atlantic Meridional Overturning Circulation) transports warm, salty water from the tropics to northern Europe and sends colder water south along the ocean floor. As a result of this circulation, Europeans enjoy considerably warmer weather.

A mounting concern is that increasing sea temperatures combined with the onslaught of fresh water from Greenland could disrupt ocean temperatures and salinity gradients, causing the AMOC to shut down. Recent research shows that the feedback loops that keep the AMOC churning are declining, and eight indirect measures of the circulation's strength have become increasingly unstable (Kaplan, 2021).

The circulation appears to be reaching a tipping point. If it crosses that line and the AMOC shuts down, much of Europe and parts of North America will experience extreme cold. This change and other likely disruptions will be irreversible.

CONCLUSION

Predictions about the future are usually derived from analyzing historical data and behavior patterns. But sudden dramatic change can also come unexpectedly—like the Arab Spring, the Brexit vote in the U.K., or the January 6, 2021, insurrection targeting the U.S. Capitol.

The best way to avoid surprises is to document and challenge your key assumptions and be honest with yourself when data mounts inconsistent with your assumptions.

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