

# UC Berkeley

## Berkeley Undergraduate Journal

### Title

Conflict or Cooperation? Arctic Geopolitics and Climate Change

### Permalink

<https://escholarship.org/uc/item/6z7864c7>

### Journal

Berkeley Undergraduate Journal, 25(1)

### Author

Ruby, Byron

### Publication Date

2012

### DOI

10.5070/B3251011695

### Copyright Information

Copyright 2012 by the author(s). All rights reserved unless otherwise indicated. Contact the author(s) for any necessary permissions. Learn more at <https://escholarship.org/terms>

Peer reviewed|Undergraduate

# Conflict or Cooperation?

## Arctic Geopolitics and Climate Change

Byron Ruby

Political Science and Society and Environment '11

### Abstract

This paper is an attempt to answer the question “could there be conflict – in particular, armed conflict – in the Arctic over disputed territory and claims of sovereignty?” In recent years, as climate change has thawed the ice in the northern regions, the prospect of new shipping lanes through once ice-locked corridors, as well as the prospect of access to new oil, gas, and mineral reserves, has led some scholars to believe that conflict could erupt as nations scramble to carve up one of Earth’s remaining ‘frontiers.’ While other scholars have debated the merits of these observations, few have undertaken a rigorous methodological approach that seeks to gauge the likelihood of conflict. This paper is thus an attempt to forge ground in making predictive analysis regarding this question. Using both historical qualitative analysis and statistical methods, I reach two conclusions: first, despite some scholars’ forbidding portrayals of the ineluctable coming strife over the Arctic, my research demonstrates that the likelihood of conflict is rather low. Cooperation, not conflict, is the most likely trend for Arctic diplomacy within the foreseeable future. And second, contrary to popular perceptions in the West, it is Canada, not Russia, who has demonstrated the highest relative likelihood of promoting conflict in the future among the nation-states evaluated.

On August 2, 2007, a mini-submarine carrying two members of Russia's lower house of Parliament descended more than two miles to the floor of the Arctic Ocean and planted a Russian flag on the North Pole. In what was viewed as a largely symbolic act, this public display of Russian technology and political temerity nonetheless sent shockwaves around the world, immediately inciting the ire of diplomats and politicians alike. Peter MacKay, Canada's foreign minister, glibly noted that "this isn't the fifteenth century, you can't go around the world and just plant flags and say, 'We're claiming this territory'" (Chivers 2007). While MacKay is correct in his assessment that the planting of a flag in the Arctic seabed in no way guarantees one's right of sovereignty over the polar region, the register of the international community's response indicated that the stunt was not taken lightly. Instead, it reflected the precarious state of Arctic geopolitics, which have become increasingly unsteady in the past ten years—not as a result of residual Cold War imperatives or antagonisms per se, but instead as a result of something radically different: climate change.

Having been a largely frozen mass for thousands of years, the Arctic region has recently begun facing radical transformations in light of climate change. Rising temperatures have left less annual ice cover, with ice levels reaching their lowest point in recorded history in 2007 (O'Rourke et al 2010). As a result, maritime routes such as the Northwest and Northeast Passages—previously navigable only with the sturdiest icebreakers—are now accessible in summer months, and it is projected that they will become accessible year-round within the next fifteen to twenty years, offering shorter shipping routes and lower operating costs. It is also estimated that, in the coming decades, a trans-Arctic sea-lane may come to exist. Furthermore, with less ice cover, it is now possible to extract resources previously locked underneath the Arctic seabed. According to a study released by the U.S. Geological Survey, up to a quarter of the world's remaining hydrocarbon reserves may be located in the frigid recesses of the Arctic (USGS 2008).

Looking to what were perceived as inauspicious climatic and geopolitical conditions, Scott Borgerson, an International Affairs Fellow at the Council of Foreign Relations, published a seminal article on Arctic geopolitics in 2008 entitled "Arctic Meltdown: The Economic and Security Implications of Global Warming," which posited that a coming resource race among the Arctic powers and energy-hungry countries like China would likely erupt in outright conflict or the type of "armed brinkmanship" that has plagued resource-rich but territorially disputed locations like the Spratley Islands for generations (Borgerson 2008, 71). However, despite Borgerson's tenable portrayal of the Arctic as the next great geopolitical powder keg, not every political theorist or international relations expert took his speculations at face value. Critics hailing from neo-liberal, realist, and constructivist camps have all since weighed in on the debate, some discrediting his claims while others supporting and expanding upon them (see Gluck 2010, Ebinger & Zambetakis 2009, Gerhardt et al 2010, and Zellen 2009). What is consistent throughout most of the literature concerning the Arctic is that the authors take retrospective approaches. That is, they are *reacting* to events and basing their speculations off those events, rather than attempting to situate Arctic geopolitics within a larger historical context. Even fewer compare or contrast what they see as drivers of (or impediments to) conflict with similar historical situations. While there is admittedly nothing wrong with taking a retrospective approach (as this paper will inevitably have to do exactly that to some degree as well), the omission of the analytical legwork of historical comparison or quantitative data analysis renders the arguments promulgated by the myriad theoretical camps ultimately unconvincing. This paper, then, will be an attempt to begin forging a more "methodologically robust" approach—so to speak—of addressing the following question: could there be armed conflict over the Arctic?

To frame this paper's response more appropriately, I will essentially conduct an empirical test of the speculations proffered in the realist position crystallized by Borgerson (2008). Instead of using my own theoretical framework to interpret and shed light on the Arctic and, in doing so, skew the significance of geopolitical events differently, I will presume the realist position's assumptions to be correct and carry out my research from there. This will strengthen any findings that suggest cooperation is to predominate, while weakening the analytical force of any findings that suggest the opposite.

This paper will use qualitative historical and statistical analysis based on a survey of data collected on territorial conflicts from 1950 through 1990 to demonstrate that the likelihood of conflict over the Arctic is relatively low, and that cooperation will likely come to dominate Arctic diplomacy, despite the periodic saber rattling. In fact, the one dispute whose conditions made it the most statistically likely to develop into conflict—Norway and Russia's dispute over the Barents Sea—was just recently resolved. However, if policymakers should exercise caution toward any nation-state, such discretion should be directed towards Canada, as it appears to be the most prone to conflict.

Regarding the structure of the research, this paper will be broken down into three sections. The first section sets out to define the scope and parameters of the research, introduce and describe the two methods used (historical dyadic analysis and the application of Paul Huth's Probit Model on Territoriality, a method derived from his comprehensive work on territorial conflicts in his 1996 book *Standing Your Ground*), and detail the limitations, assumptions, and merits of both methods.

The second section will be a presentation and analysis of the research on the dyads—or "pairs"—of Arctic countries. This qualitative, historical research will attempt to situate the prospect of conflict between countries contextually by looking at whether or not these countries (1) possess a history of successful diplomacy, (2) enjoy some level of trade, (3) have had a history of armed conflict or diplomatic disputes in the past twenty years, barring any current Arctic disputes, (4) have a significant difference in the degrees of democracy, as measured by Freedom House scores, and (5) recognize each other diplomatically and treat each other as friend or foe within public channels. The dyads to be analyzed are those of the Arctic coastal nations: the United States, Russia, Canada, Denmark (via Greenland), and Norway.

The third section will then shift gears to a comparison using quantitative data from Huth. It will take one recently resolved territorial dispute, and three current disputes, between the coastal Arctic nations—Canada and Denmark's row over Hans Island, Norway and Russia's dispute in the Barents Sea, and the United States and Canada's disputes over the maritime control of the Beaufort Sea and Northwest Passage—and compare the results for the likelihood of armed conflict arising from each diplomatic dispute using the coefficients Huth distilled from studying territorial conflicts around the globe between 1950 and 1990.<sup>1</sup> It will then discuss the statistical results (a range of p-scores) in context with a case study analysis of the dispute and the dyadic analysis presented earlier to both calibrate the quantitative score and discuss any potential discrepancies between the qualitative and quantitative findings.

Lastly, this paper will offer a conclusion, which will serve not only to reiterate and condense the findings of the previous sections, but will also situate the findings in a wider literature

---

<sup>1</sup> I will exclude Russia's claim of the North Pole insofar as it is not clear who the "target" state is. Knowing the target state is a precondition for using Huth's model. In fact, Huth excludes disputes from Antarctica because "no single country is recognized as having sovereign rights over Antarctica" (Huth 1996, 242). See the methodology section for more detail on Huth's model and its parameters.

of environmentally driven resource conflicts and territorial conflicts. It will also present directions for future research.

## 1. Methodology

### *1.1 Parameters of the Research: Defining Conflict*

Prior to delving into the results of the research, it is important to define the parameters of the research, namely in terms of the definition of "conflict," the scope of the research, and the merits of a "methodologically eclectic" approach.

Within the existing literature on Arctic geopolitics and climate change, few authors explicitly define what they mean by "conflict." In fact, the term is often thrown around loosely, sometimes referring to a state of armed warfare or at other times to conflict of the political or diplomatic kind. While these uses are certainly legitimate and within the established meaning of the word, it makes for fuzzy boundaries and ambiguous projections: the chance or likelihood of future diplomatic "conflict," whatever that is intended to mean, most certainly differs—and probably differs starkly—from the chances of total war between two Arctic nations. Thus, for the purposes of this research, unless otherwise specified, conflict is defined as a militarized confrontation between at least two countries. No shots need be fired, nor do casualties need to be suffered. A formal declaration of war would also be too high of a standard for "conflict," as that would exclude such prominent wars like those in Korea, Vietnam, and the Persian Gulf on the basis of what has become in many respects a dispensable procedural formality. Rather, the mere formal invocation of some form of coercive force is sufficient to qualify an event as a form of conflict (e.g. ordering a ship to fire across the bow of another ship belonging to another nation). A baseline example of what would constitute a conflict, then, is the Turbot War of 1995 between Canada and Spain, where the Canadian Navy boarded a Spanish fishing vessel and arrested its crew for fishing in Canada's Exclusive Economic Zone off the coast of Newfoundland (Nordås & Gleditsch 2007, 631). In this respect, this definition of conflict differs slightly from the typical notion of "war," which tends to connote much greater military mobilization and the number of casualties being greater than zero (Bremer 1992, 310).

The logic for narrowing the scope of conflict in this respect is twofold. First, while there has certainly been a history of diplomatic dispute in the Arctic, there has yet to be any form of armed brinkmanship or militarized conflict to date—at least not since the fall of the Soviet Union in 1991. This leaves such future-facing projections on armed conflict—such as this research—still a relevant exercise. Second, it creates a clear distinction between what does constitute "conflict" and what does not. Definitions of conflict seeking to make qualitative judgments on the degree, size, or escalation of conflict inevitably invite criticism in terms of the arbitrariness of the line that renders some conflicts authentic and others as something else altogether.

That said, the methodology used further narrows and limits the scope of the question and the explanatory output it produces, since the extent and explanatory power of the projection cannot be separated from the method used. This recognizes that different methods have both strengths and merits in forecasting future trends. Hence, I will be combining a qualitative and quantitative method, pursuing a strategy known as "methodological eclecticism," so as to hedge against the weaknesses of a purely quantitative or qualitative research approach (Yanchar & Williams 2006, 3). This eclectic approach—comprised jointly by a historic dyadic analysis and a statistical simulation—is examined in the following sections.

## *1.2 Historical Dyadic Analysis*

A staple unit of analysis in the Democratic Peace Theory (DPT) literature and interstate conflict studies, a "dyad" refers to a pair of nations. Interstate dyadic relations are thus strictly bilateral interactions. While necessarily limited in scope vis-à-vis the omission of multilateral strategic interactions, this unit of analysis has served as the "analytical cornerstone" of interstate conflict research (Croco & Teo 2005, 5). The process of historical dyadic analysis, then, is to draw inferences about future bilateral relations from past events and structural characteristics formative of countries' current dyadic interstate relationships. Specifically, I will seek to answer five questions for the ten dyads constituting the pairs of the five Arctic coastal states: do these states (1) possess a history of successful diplomacy, (2) enjoy some level of trade, (3) have a history of armed conflict disputes in the past twenty years, barring any current Arctic disputes, (4) have a significant difference in the degrees of democracy, as measured by Freedom House scores, and (5) recognize each other diplomatically?

In pursuing this approach, one must inquire as to the temporal scale of these relationships—i.e. is it worth exploring these countries' bilateral relationships since their inception (which may span several centuries) or only the most recent years (which may give a better sense of the direction of the relationship in question)? Although this research will not attempt to ignore any particularly important or salient historical events in these countries' histories that antedate the past two decades, it will indeed focus on the last twenty years in particular for two reasons.

First, the past twenty years marked a turning point in the international world balance of power. The Soviet Union fell in 1991, giving rise to the Russian Federation and formally ending the protracted Cold War with the United States. This not only left the United States as the sole hegemon in a unipolar world, but it also meant the demilitarization of the Arctic (Mearschiemer 2008; Young 2005). In many respects, the fall of the Soviet regime meant a "reset" on Arctic geopolitics, rendering the early 1990s a valuable starting place in terms of studying the dyadic relationships of Arctic nations.

Second, the early 1990s marked the advent of climate change science gaining traction in policy-making circles. In 1992, the U.N. met in Rio de Janeiro for the United Nations Conference on Environment and Development, which produced the United Nations Framework Convention on Climate Change (UNFCCC). Despite continuing disputes within policy circles on the validity of climate change, especially from the right, climate change has nonetheless grown in the past twenty years to become a forefront issue in both environmental and security circles (O'Neill 2009; Scheffran 2008). Having only entered into policy-makers' decision-making calculus in the past twenty years, then, it makes sense to give primacy to this period when studying Arctic geopolitics vis-à-vis climate change and its consequences.

Critics objecting to a historical dyadic analysis, however, may raise several concerns. The first is the problem of extrapolation: on what basis can we project the likelihood of certain outcomes based off past history? Admittedly, dyadic analysis is no crystal ball. But it would be equally going too far to say it provides no insights whatsoever. Instead, it takes the middle ground, providing researchers—and the state actors they study—a political topography to contextualize relations and decision-making rather than a comprehensive predictive forecast. This allows for the identification of potential "hotspots"—albeit in a relative sense, rather than absolute one—that should be approached with caution in policy circles and further investigation in academic circles.

A second problem is that of scope: why just the five Arctic littoral states? Why not include in this study the full set of eight Arctic nations, let alone—and perhaps more notably—non-Arctic states like China that exogenously influence Arctic geopolitics? In choosing which dyads to pick, a tradeoff does occur, in that the fewer dyads one takes on, the less externally valid the results of the research become. But that does not render the decision to narrow the scope of this research intellectually hollow. In this case, several reasons exist to limit the scope of the research to the five littoral states.

Excluding the other three Arctic nations—Sweden, Finland, and Iceland—is grounded in the fact that currently none of their borders is in question. While certainly possessing territory north of the Arctic Circle, it should be noted that not all territory is created equal: some is well defined, some is not. In either case, these three Arctic nations have no current territorial disputes, no ambiguous borders, and possess no claim to waterways that are only now becoming navigable. None of their strategic resources—be it oil, gas, or fisheries—is caught in diplomatic limbo. On the other hand, all five of the Arctic littoral states have recently been, or are currently, involved in a territorial dispute with at least one other littoral state: Norway and Russia's maritime dispute in the Barents Sea; Canada and Denmark's dispute over Hans Island; and the United States and Canada's disputes over navigability of the Northwest Passage and the maritime border in the Beaufort Sea.

Moreover, while non-Arctic nations certainly influence the geopolitics of the Arctic, that is a separate question to be addressed altogether. Even notable omissions like China are justified insofar as countries like China are not currently embroiled in existing territorial disputes in the Arctic. That said, this will be an area of research to expand later on, falling outside the scope of this paper.

### *1.3 Paul Huth's Probit Model on Territoriality*

The second approach this paper will use to address the question of conflict in the Arctic stems from Paul Huth's 1996 work *Standing Your Ground: Territorial Disputes and International Conflict*. In this book, Huth focuses on territorial disputes as causes for war. He looks at a comprehensive population of interstate territorial disputes from 1950 to 1990 to test a set of hypotheses, derived from a modified realist paradigm, in order to determine what conditions or factors increase or decrease the likelihood of conflict and to what degree. Because he uses the ordered probit statistical model as a means to test the explanatory power of different variables, I refer to his model as Huth's Probit Model on Territoriality.

In this part of the methodology section, I first discuss Huth's modified realist paradigm and his conception of a territorial dispute's progression. Next, I explain any coding differences between Huth's and my approach. Then, I describe the equation I use to estimate predicted probabilities from the statistical results of an ordered probit analysis of his data. Lastly, I elucidate the assumptions I make in applying his work to my research before finally discussing the limitations and merits of applying his model to my research on the Arctic.

Territorial disputes involve a disagreement between states either over where a border should be fixed, or whether or not one state can exercise sovereignty over part of the other state's territory. A dispute can begin, then, when at least one government does not accept the definition of where its boundaries with another country lie (Huth 1996, 19). Such territorial disputes, once recognized, can go one of three ways: minimal levels of diplomatic conflict, moderate to high levels of diplomatic and political conflict, or high levels of diplomatic pressure coupled with

militarized confrontation (i.e. a "conflict," in the argot of this paper). This can be reformulated into three dependent variables, understood as potential "outcomes" of a registered dispute:

Low level diplomatic conflict:	$y = 0$
High level diplomatic conflict:	$y = 1$
Militarized dispute:	$y = 2$

Eventually, such a dispute will be resolved, either by the challenger country seizing the territory by force, acquiring the territory by agreement, or compromising some other settlement with the target country, potentially withdrawing their claim for the territory (Huth 1996, 30, 105). While Huth addresses each of these three stages in his work, calculating the effect that certain variables possess in terms of explaining, for instance, why states resolve disputes the way they do or why states find themselves in these disputes in the first place, *I will only apply his work from the second stage*, that is, when states are faced with a choice of how to move forward in light of an existing territorial dispute.

In order to understand the calculations made on behalf of the state actors during this particular stage in the progression of a territorial dispute, it helps to turn to a theoretical model for insights. Huth presents a "modified realist paradigm," which incorporates a number of assumptions from conventional realist approaches, but differs in that it recognizes the role that domestic politics plays in strategic calculations regarding territorial disputes (Huth 1996, 39).<sup>2</sup> Nonetheless, his model is consistent with the paradigm implicit in Borgerson's analysis and the historical dyadic methodology, insofar as it recognizes realist conventions concerning the primacy of power, but does not reduce the paradigm to levels as parsimonious as, say, Kenneth Waltz's structural realist view concerning international systems and relative stability (Huth 1996, 40).

In either case, Huth derives thirteen independent variables to test from the assumptions of this modified realist paradigm.<sup>3</sup> I follow Huth's coding criteria for each of these variables, which he outlines in pages 256 through 263, with the following three exceptions: first, with respect to  $x_2$  and  $x_3$ , these variables require populations to be in the disputed territory. But since each disputed territory in the Arctic consists of either maritime territory or unpopulated islands, these variables will be uniformly coded 0 (Harper 2005b). Second, with respect to  $x_{13}$ , I used the POLITY IV dataset from the Inter-University Consortium for Political and Social Research at the University of Michigan to measure the democratic norms of the challenger since it is more up-to-date, while still consistent with Huth's approach, as he used the POLITY II dataset in his original work. And third, I diverge slightly from Huth's method of coding variable  $x_{12}$ . Because his time frame explored disputes from 1950 to 1990, he measured the total number of militarized disputes between challenger and target dating back to 1900 to get a sense of how much conflict dominated the

<sup>2</sup> See Huth (1996) pages 41-48 for his list of nine assumptions constituting the modified realist model.

<sup>3</sup> Huth's variables are as follows:  $x_1$  = strategic location of bordering territory;  $x_2$  = support for minorities along border of target with ethnic ties to the challenger;  $x_3$  = political unification based on common ethnic background between challenger and target population;  $x_4$  = economic value of bordering territory;  $x_5$  = balance of conventional military capabilities;  $x_6$  = dispute involvement of challenger with other states;  $x_7$  = stalemate in negotiations;  $x_8$  = target attempts to change status quo;  $x_9$  = defeat or stalemate for the challenger in armed conflict;  $x_{10}$  = deterrent alliance ties of target;  $x_{11}$  = common security ties between challenger and target;  $x_{12}$  = prior history of militarized disputes;  $x_{13}$  = democratic norms of the challenger.

dyad's relationship (Huth 1996, 261). Since my time frame is different, it would not make equal sense to measure the number of territorial conflicts between, say, Canada and Denmark between 1900 and 1950. Instead, because the dyadic analysis in Section 3 effectively deals with this issue in the same spirit as Huth, this variable is coded on the same terms as the dyadic analysis, i.e. looking at the number of militarized disputes between challenger and target in the past twenty years. This produces a uniform coding of 0 for each dispute.

As mentioned earlier, Huth tested these independent variables against a population of dispute cases from 1950 to 1990 in order to determine to what degree conditions like the presence of natural resources or the presence democratic norms in the challenger country affect the likelihood of conflict escalation. That said, the task now becomes finding a way to use this statistical data to derive a predicted probability for a particular outcome for any given individual observation—i.e. what would be the probability of  $y = 2$  for dispute A? Dispute B? While Huth reports the values for the marginal impact of the independent variables on the probability towards the three different outcomes ( $y = \{0, 1, 2\}$ ), this data is insufficient in finding a probability score for a single observation insofar as each value provided for the marginal impact of a single independent variable assumes that all other continuous variables in the equation are kept at their mean and all dummy variables are kept at their modal value. Therefore, it would be methodologically unsound to simply aggregate the marginal impact probability scores for each variable after coding them for an Arctic dispute, since changing one variable necessarily changes the rest. The solution, then, would be to (1) acquire Huth's raw data, re-run the ordered probit model, and compare results to ensure that the data is the same; (2) use the data to find both the variables' coefficients and estimated threshold parameters  $\tau$ ; and (3) introduce a new equation that finds the cumulative distribution of a single variable for a standard normal distribution.

Following this prescription, I first acquired Huth's raw data from an online source (CIDCM 2011). To make sure the data was the same data he used in his book, I ran the data through an ordered probit program on SDATA v.10 and received the following results:

dep_variable	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
selection_s	-.6165587	.1174259	-5.25	0.000	-.8467093	-.3864081
strategic_n	.4197432	.0595593	7.05	0.000	.303009	.5364774
border_min_y	.7938805	.0596439	13.31	0.000	.6769806	.9107804
pol_unific_n	.7448477	.0631932	11.79	0.000	.6209913	.8687042
econ_value	-.23295	.0502761	-4.63	0.000	-.3314895	-.1344106
military_b_e	.8081263	.0972586	8.31	0.000	.617503	.9987496
chg_disputes	-.1189002	.0155922	-7.63	0.000	-.1494603	-.0883401
stalemate	.689445	.062847	10.97	0.000	.5662672	.8126228
change_sta_o	.3969985	.0587845	6.75	0.000	.2817831	.5122139
defeat	-.1980504	.0416692	-4.75	0.000	-.2797206	-.1163802
deterrent_e	-.0686578	.0541573	-1.27	0.205	-.1748043	.0374886
consec_ties	-.7264187	.0633401	-11.47	0.000	-.850563	-.6022744
prior_mids	.0353204	.0035679	9.90	0.000	.0283275	.0423133
democratic_s	-.0107175	.0036755	-2.92	0.004	-.0179215	-.0035136
/cut1 (tau1)	.1391574	.1487665			-.1524195	.4307343
/cut2 (tau2)	1.466242	.1513558			1.16959	1.762894

**Figure 1: Results from ordered probit of Huth's raw data from *Standing Your Ground*. Note: Number of observations = 3,039; Log-likelihood = -2,300.7; all significance levels based on one-tailed tests.**

The results in Figure 1 match those found in Huth (see page 107), although I have also reported the estimated threshold cut-off parameters ( $\tau$ ), which Huth fails to provide in his original work—a critical component in "reverse engineering" this data to find the predictive probability of a single observation.

Now that I have ensured the data acquired online matches the data used in his book, I will use the following equation to find the predicted probability for a single observation for when  $y = 2$  (i.e. when militarized conflict occurs):

$$1 - F(\tau_1 - x_x \hat{\beta})$$

Where:

$F$  is a cumulative distribution function for a standard normal distribution,<sup>4</sup>

$\tau_1$  is an estimated threshold parameter (tau),

$x_x$  is the value for an independent variable coded from an Arctic dispute,

and  $\hat{\beta}$  is the corresponding estimated coefficient for each independent covariate  $x_x$ .

This equation gives the predictive probability given data points from an ordered probit. Both  $\tau$  and  $\hat{\beta}$  are obtained from the data results listed in Figure 1 above, while the values for  $x_x$  will be obtained by coding the conditions for each Arctic dispute. I will disclose these coding values for  $x_x$ —in addition to the resulting probability scores—in Section 4.

To briefly summarize, this approach begins with Huth's modified realist paradigm, which serves as his basis in developing a number of independent variables ( $x_x$ ) that he hypothesizes are influential in the escalation of territorial disputes to militarized conflicts ( $y = 2$ ). In order to determine the marginal impact of each variable in leading to militarized outcomes, he tests these independent variables against a data set of territorial disputes from 1950 to 1990. That said, to use this dataset to get predicted probabilities for a single dispute (say, an individual Arctic dispute), I first re-ran Huth's data through an ordered probit to find  $\tau$  and then introduced a new equation (listed above) which allows me to determine the probability that a militarized conflict will occur, based on the values for the particular Arctic dispute I have "plugged" in.

However, this approach makes a number of assumptions. First, this assumes that the Arctic is no less territorially unique than any other region of the globe. Although the Arctic is meteorologically and geographically unique, to which Section 1 alludes, as well as discursively unique in the social construction of the region itself, it suffices to say that most parts of the world have local or regional idiosyncrasies that render them "unique" in some fashion (Heininen & Nicol 2007). Since Huth's data does not privilege any region over any other, taking a comprehensive view of the total population of territorial disputes, then it is reasonable to assume that the application of his model to the Arctic is permissible, insofar as the most salient criterion for Huth is that there is a clear challenger and target.

Second, this approach assumes that the current time period is no less unique than the period between 1950 and 1990. It is an unfortunate reality that Huth, publishing in 1996, did not continue updating his model as time went on. Certainly, more conflicts have occurred since 1990 that could alter the explanatory coefficients. Yet, no research exists contradicting Huth's findings or providing powerful counterexamples to his claims. Furthermore, the one notable change between these time periods—notable, at least, for a theorist like Waltz—is that the Cold War dominated the preceding period. While this could pose a problem if Huth had only limited his analysis to major powers, he makes an explicit point to explore his modified realist paradigm with respect to major and minor powers alike, many of which operated outside of Cold War imperatives in pursuing their territorial disputes—e.g. U.K and Argentina in the Falklands or India and Pakistan in Kashmir (Huth 1996, 40).

Third, this approach makes the assumption that disputed maritime or littoral territory is strategically equivalent to disputed territory on land. On a superficial level, this assumption may

<sup>4</sup> I use an online statistical calculator to compute values into this function. See Soper 2011.

look fatal, but upon closer inspection there appears no reason why strategic calculations should differ significantly, at least in the short-term: water and ice may limit the forms of transportation, but development of resources can still occur and militaries can still be deployed. Littoral states around the globe already conceptualize certain waters as part of their territory anyways, such as China and the Straights of Taiwan (LaFeber 2008). Next, one could imagine that policy-makers, used to dealing with landed border disputes, would apply similar thought-processes and strategic calculations to an essentially similar issue over water and ice, rather than land. Lastly, Huth himself states that “all cross-water borders of up to 200 miles were also identified for the period between 1950-1990...[a]ll islands within 200 miles of one another and subject to some form of colonial rule or administration by two different states were included as well” (Huth 1996, 252). Thus, it remains permissible to apply Huth’s data to disputes in the Arctic.

The advantage of using Huth’s data, then, is that it provides empirical insights from numerous past disputes, identifying key variables in predicting whether or not disputes become conflicts. Since it provides quantitative scores, it serves as a methodological compliment to the qualitative analysis conducted with dyads. Therefore, the combination of these methods allows for both wide-scale and in-depth views. The dyadic analysis supplies a macroscopic view, determining if the region is conflict-prone and where those hotspots will be. On the other hand, the application of Huth’s Probit Model on Territoriality furnishes insight to specific Arctic disputes and their probability of escalating into larger conflicts, thereby taking a more microscopic view. This dual view of the Arctic region, then, constitutes the basis of this research’s methodological eclecticism.

## 2. Dyadic Analysis

### 2.1 Overview

In this section, I will present the data collected concerning the ten dyads for the five Arctic littoral states. This data looks to the number and frequency of bilateral agreements as an indicator of successful interstate diplomacy, export levels to gauge the degree of economic interdependence between states, Freedom House scores to discern the degree of democratic institutions, and Correlate of War data on diplomatic exchanges to determine if diplomatic relations are normalized and if war has occurred between any of the five Arctic states in the past twenty years. I will first discuss the rationale behind studying these facets of the Arctic dyads’ relationships before presenting the data and providing an analysis of it.

First, studying dyads’ recent history of conflict sheds insight on the propensity for future conflict since past conflict statistically begets future conflict. Paul Hensel, studying interstate conflicts from 1816-1992, found that adversaries “are more likely to become involved in recurrent conflict” (Hensel 1996, 43). Regardless of the issues involved, 61.2% of all militarized disputes studied in the population were followed by another dispute between the same adversaries “within fifteen years” (Hensel 1996, 62). Possible causal explanations are that there exist structural sources of misalignment between the two adversaries or, that once the leaders of at least one nation have demonstrated willingness to go to war, it makes it easier to go to war again. The inverse of the latter explanation has some empirical grounding, as Mark Crescenzi found studying dyads from 1817 to 2000 that a country’s reputation for hostility “increases” the likelihood of intra-dyadic conflict “markedly” (Crescenzi 2006, 25). Certainly, arguments abound that once war has been conducted, especially over territory, intangibles like national identity and honor

lead to a "sore loser syndrome" that can incur future backlash and domestic incentives to push for military confrontation (Hensel 1996, 45-47).

Second, knowing whether or not two countries mutually recognize each other in diplomatic channels is a strong proxy for how tense the dyadic relationship is. Not only is the withdrawal of diplomats and emissaries a symbolic act of disapproval, but it also forces communication—if any—into back channels or third-parties (LaFeber 2008). A powerful example is that of the United States and the People's Republic of China after the fall of the Kuomintang. For several decades, the United States refused to recognize Chinese leadership on the mainland, leading to heightened perceptions (or, perhaps, misperceptions) on both sides that the other nation was a greater threat than it actually was (LaFeber 2008, 261-263). As theorists like Jervis have noted, such misperceptions can feed into and fuel the security dilemma further, leading to volatile political situations (Jervis 1976).

Third, investigating levels of bilateral trade sheds light on levels of economic and political interdependence between nations. Although the lack of trade between nations should not be viewed as a trigger for war, the converse—a high degree of bilateral trade—is often a significant damper on war and conflict. With its roots in classical liberals like Kant and Montesquieu, this perspective has gained empirical traction in recent years, the rationale being that trade reduces incentives to fight since conflict interrupts and interferes with trade, while potentially leaving the warring countries vulnerable if they are dependent on their adversary for certain raw materials, commodities, or services (Gartzke & Quan 2003; Hegre et al 2010). Empirical studies of interstate dyads have confirmed that increased bilateral trade is “associated with lower incidences of militarized interstate disputes and war, even controlling for potentially confounding, theoretically interesting influences: geographic contiguity, the balance of power, alliance bonds, and economic growth rates” (Oneal & Russett 1997, 288). Therefore, it is important to take stock of levels of bilateral trade between dyads in the Arctic, as high levels of trade may be an indicator of heightened cooperation in future relations.

Fourth, a similar facet of dyadic relationships is bilateral agreement making. Bilateral agreements encompass a wide range of issues, ranging from military alliances, trade treaties, and joint scientific ventures. The prevailing wisdom is that treaties and alliances merely represent “expediency” and “nothing deeper than a temporary need of two or more states to coordinate their actions” (Bremer 1992, 315). Nonetheless, a preponderance of bilateral treaty creation and maintenance over a prolonged period of time may reflect, then, an alignment of durable (and potentially long-term) structural interests, be they economic, military, or otherwise.

And fifth, drawing from literature on DPT, a final indicator worth investigating is the institutionalized levels of democracy within each Arctic nation. In the case of DPT, the empirical findings are more or less undisputed—democratic dyads rarely go to war, although mixed dyads of democracies and autocracies are still prone to the outbreak of conflict (Oneal & Russett 1997). The theoretical underpinnings for explaining why democracies resist going to war with each other, however, are less unequivocal. Explanations range from Kant's institutionalism to notions of a democratic "culture" that impedes fighting 'like-minded' nations (Russett 1993). Regardless of the causal link—if we are to presuppose there even is one—that reduces militarized conflict between democracies to *recherché* historical anomalies, the empirical trend leans strongly in favor of democratic dyads, suggesting that the degree of democratic institutions should at least for now be left as an important indicator of the likelihood of future conflict.

## *2.2 Data & Analysis*

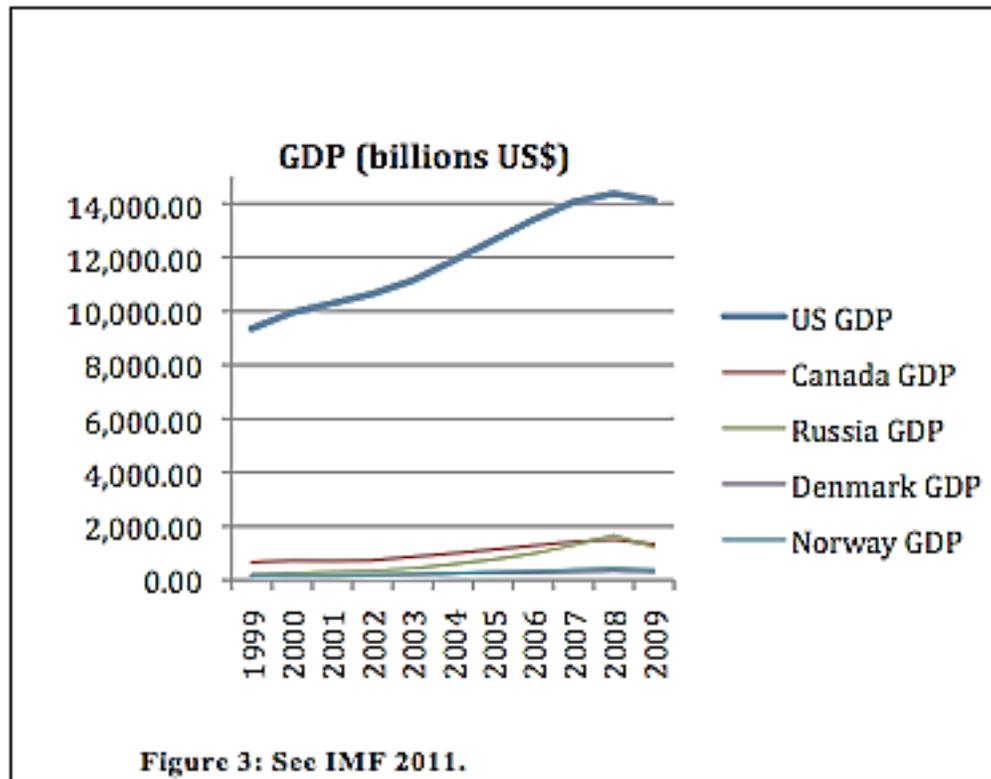
The results in Figures 2-8 show the collected data on the dyads for the United States, Canada, Russia, Norway, and Denmark. Figures 4 and 5 show data from the International Monetary Fund on single-direction exports in millions of dollars. The United States and Canada's trade relationship is separated from the other dyads in Figure 4 for visual purposes, since their trade is orders of magnitude higher than the other pairs.

Figure 2 shows a compilation of data on the number of bilateral agreements in force, the history of armed conflict, normalized diplomatic relations, and difference in Freedom House scores as a measure of democratic institutions in 2010. Not included in the table are the absolute scores of each country, which are the following: the United States received a combined total Freedom House score of 93, Canada received a score of 99, Russia received a score of 83, Denmark received of 96, and Norway received a perfect score of 100. Freedom House scores serve

Dyad	Armed conflict in the past 20 years?	Normalized diplomatic relations?	Difference in Freedom House scores (2010)?	Number of standing bilateral agreements formulated in past 20 years?	Overall number of standing bilateral agreements?
U.S.-Canada	No	Yes	5	93	357
U.S.-Russia	No	Yes	11	90	90
U.S.-Denmark	No	Yes	2	15	64
U.S.-Norway	No	Yes	6	20	73
Canada-Russia	No	Yes	16	17	17
Canada-Denmark	No	Yes	3	5	49
Canada-Norway	No	Yes	1	8	32
Russia-Denmark	No	Yes	13	12	12
Russia-Norway	No	Yes	17	20	20
Denmark-Norway	No	Yes	4	9	41

**Figure 2:** See U.S. Dept of State 2010, Bayer 2006, Ghosn et al 2004, Russian Ministry of Foreign Affairs 2011, Norwegian Ministry of Foreign Affairs 2011.

as a proximate indicator of levels of democracy, in that they measure political freedoms and civil rights within given countries.



In reviewing this data, several notable trends are worth pointing out. First, there has been no history of armed conflict among the five Arctic nations in the past twenty years and all have established diplomatic relations. No country is left unrecognized or left as a pariah; and no recent armed conflicts exist to severely taint the dyadic relationships, even if flashbacks of Cold War emerge within policy discussions concerning Russia. Generally speaking, the absence of war and maintenance of diplomatic recognition is an auspicious sign for cooperation, given the previous analysis of what these indicators signal.

Second, the Arctic nations all possess relatively democratic institutions. Among this sample of five, Russia is the outlier with a combined score of 83, while the other four cluster around the high-end percentiles, indicating robust democracies and respected civil and political rights. It is difficult, however, to determine whether or not the absolute difference in Russia's score from the other nations' scores is sufficient enough to incur the dangers that arise in democratic-autocratic dyads, which are notoriously conflict-prone.

Third, despite similar levels of democracy and lack of conflict in recent decades, there are rather stark differences in terms of numbers of bilateral agreements. The United States and Canada have the highest number of overall agreements or treaties in force at three hundred and fifty-seven. Moreover, the rate of diplomatic activity between the U.S. and Canada has been increasing, as 26% of the total treaties were formulated during the past twenty years despite possessing a formal diplomatic relationship spanning over a century. But that is not just unique to the U.S. and Canada; rather, a trend has emerged where the U.S. has forged roughly one-quarter of all its total agreements with the other Arctic littoral states in the past twenty years: approximately 27% of its total number with Norway and approximately 23% of its total number with Denmark. Russia stands as an exception, insofar as the state only came into official diplomatic existence within the past twenty years.

Despite profuse diplomatic activity with the United States, Canada's other interstate relationships are more lacking in terms of the amount of bilateral agreements. What is particularly noteworthy is Canada's total number of agreements with Russia, which is the minimum number of total agreements for any dyad, and Canada's number of agreements made in the past twenty years with Denmark, which is only 10% of its total number. This last figure indicates that diplomatic activity has been substantially lower with Denmark in recent years, and is in fact well below the mean rate of diplomatic

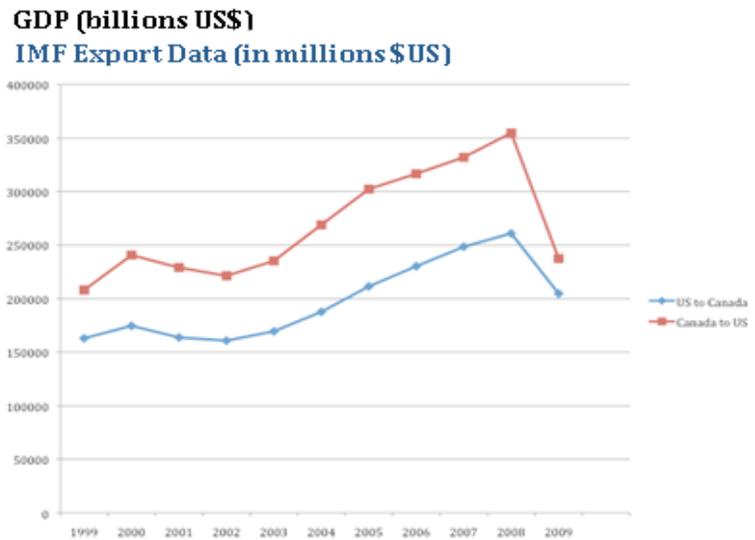


Figure 4: See IMF 2011.

agreements with Russia. Although there is not a large enough N to draw statistically significant inferences, the figures are nonetheless indicative that, on par, Canada has had significantly less diplomatic activity than any other Arctic littoral state, especially with Denmark.

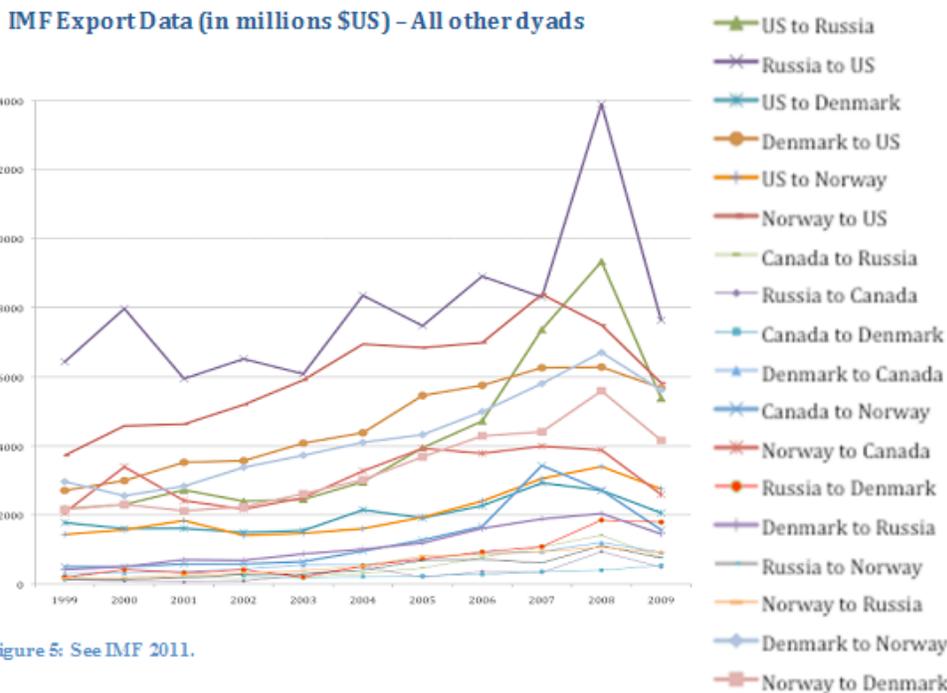


Figure 5: See IMF 2011.

Fourth, levels of bilateral trade vary greatly among the dyads, in part because the size of each respective country's economy differs with substantial variance. Since the United States has the largest economy in the world, it is generally the top importer for each of the other countries,

barring Norway, which imports similar amounts from Denmark—whose economy is only a fraction of the economy of the United States, at about 2% of U.S. gross domestic product (GDP). This alone indicates a proportionally strong trading relationship between Denmark and Norway.

A better measurement of interdependence is found in Figures 6-8. These graphs show the export levels as a percentage of the sender country's GDP. Using Microsoft Excel, I calculated

the changes in these ratios with total GDP data by country from the International Monetary Fund (IMF). Split up into three graphs for visual ease, the first group of percentage lines cluster around 2% of senders' GDPs, while the second group in Figure 7 cluster around 0.1% of senders' GDP. The one outlier in this group is Canada's export-to-GDP ratio, which sits around 20% to 30% of its GDP (and therefore receives its own separate graph for visual ease and scalar coherence). This indicates a strong degree of economic interdependence between the United States and Canada, although the trend indicates that this dependence may be lessening slightly.

Several other observations are worth noting. In the U.S.-Russia dyad, the export-to-GDP ratio is dropping while overall bilateral trade is increasing. What appears, then, to be a paradox can be explained by the fact that Russia's overall GDP is increasing rapidly, outpacing the amount that it proportionally trades with the United States. Next, the three dyads of Russia-Norway, Canada-Russia, and Canada-Denmark

have not only the lowest levels of bilateral trade (with the lowest being Canada's export level to Denmark), but these dyads also possess the lowest export-to-GDP ratios, barring those caused by skews in sheer size of base GDP (for example, Denmark's export-to-GDP ratio

Exports Percent of Sender Country's GDP

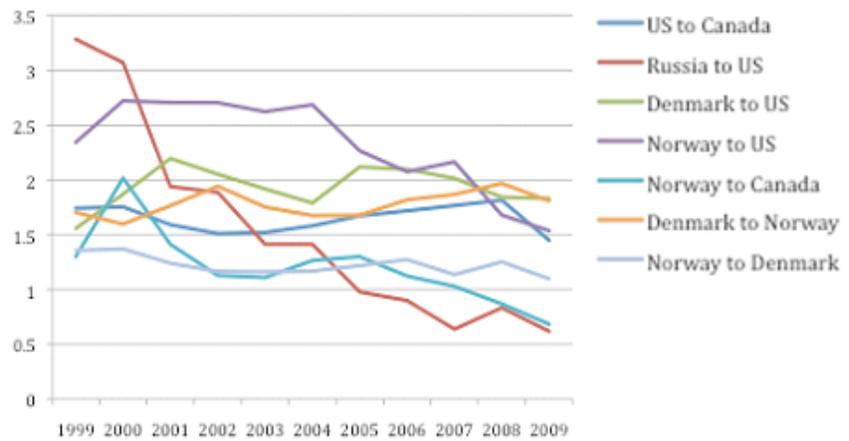


Figure 6: See IMF 2011.

Exports Percent of Sender Country's GDP

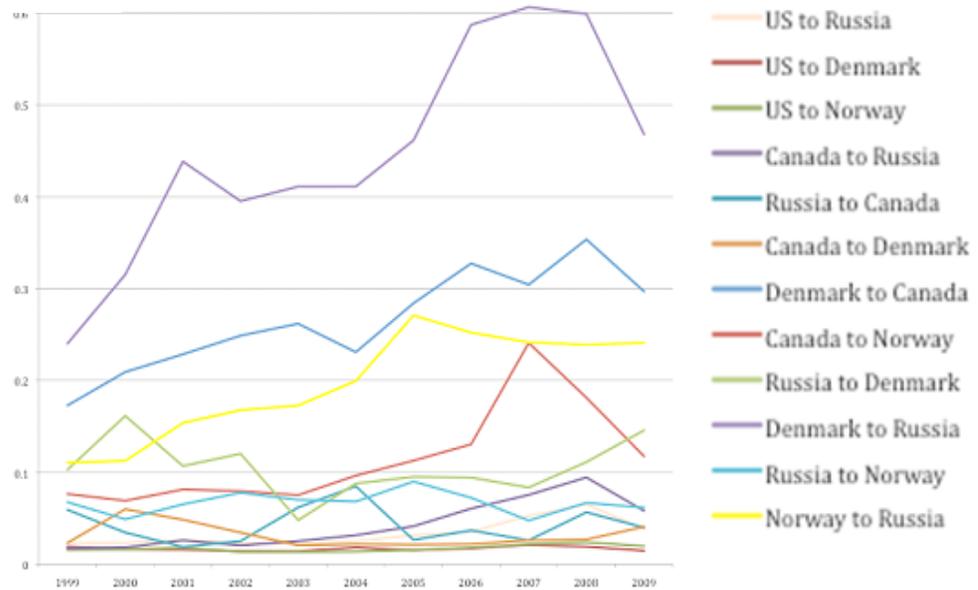


Figure 7: See IMF 2011.

with the U.S. is high relative to the concomitant export-to-GDP ratio the U.S. has with Denmark, which was the absolute lowest ratio). Russia's export-to-GDP ratio with Canada and Canada's export-to-GDP ratio with Denmark were the next lowest, both at roughly 0.04%.

In summary, this dyadic analysis shows that the Arctic states enjoy relatively stable relations. Every state—endowed with strong institutions and exceptionally high levels of political freedom, with the exception of Russia—recognizes, trades with, and makes diplomatic entreaties with each of the other states. Of the ten dyads, two are particularly strong on almost all accounts: U.S.-Canada and Denmark-Norway. Their dyads boast robust levels of trade, diplomatic engagement, similarly high Freedom House scores, and no history of conflict or diplomatic withdrawal. The strength of these dyads suggests there needs to be less concern over these states entering into armed conflict, given the high level of political alignment and economic interdependence. Three dyads, however, are worth paying attention to as potential hotspots: Denmark-Canada, Canada-Russia, and, to a lesser extent, Russia-Norway. Denmark-Canada has some of the lowest absolute trade levels (and resulting export-to-GDP ratios) as well as a decreasing rate of diplomatic activity in the past

Exportas Percent of Sender Country's GDP

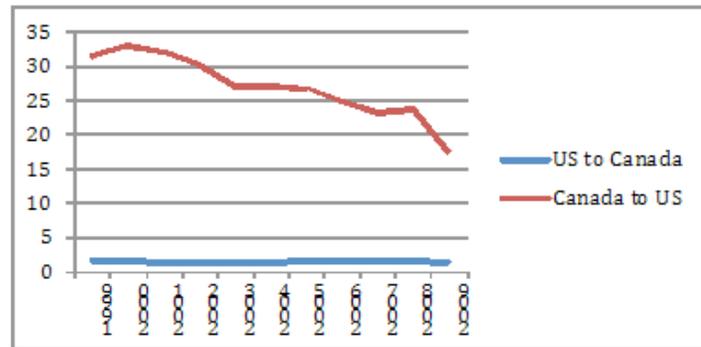


Figure 8: See IMF 2011.

twenty years. But, Denmark and Canada have relatively similar Freedom House scores, which constitutes a point of distinction with Canada-Russia and Russia-Norway, whose Freedom House scores differ the most of the five states evaluated and whose trade levels are also comparatively low. That said, it should be reiterated that lower trade levels are not necessarily cause for conflict (and it would certainly be myopic to label any of these trade levels as ‘low’ in anything but a relative sense). Rather, lower levels of trade simply suggest that the costs of going to war are lower, since there is less to lose from war’s destructive interference (or perhaps the threat of unilateral sanctions from increasingly belligerent militarized activity). That said, there would still need to be a *casus belli*, which serves as a perfect segue to the evaluation of recent Arctic disputes.

**Summary Table: Relative Strength of Dyads**

Relative Strength of Interstate Relationship	Dyad
Strong	U.S.-Canada
	Denmark-Norway
Average	U.S.-Norway
	U.S.-Denmark
	Canada-Norway
	Russia-Denmark
Weak	Russia-Norway
	Canada-Denmark
	Canada-Russia

Figure 9: Note that these rankings and their cut-offs are only approximations.

less to lose from war’s destructive interference (or perhaps the threat of unilateral sanctions from increasingly belligerent militarized activity). That said, there would still need to be a *casus belli*, which serves as a perfect segue to the evaluation of recent Arctic disputes.

**4. Case Studies of Arctic Disputes**

*4.1 Overview*

In this section, I will take a closer look at individual Arctic disputes currently existing or recently concluded between the five littoral Arctic states. The disputes being studied are those territorial disputes over the Beaufort Sea between the United States and Canada, Hans Island between Canada and Denmark, the Barents Sea between Russia and Norway, and the Northwest Passage between the United States and Canada. Studying these disputes serves as a compliment

to studying the dyads and their general tendencies, since these are potential flashpoints, temporally and contextually rooted in the current geopolitical landscape. In this respect, they look at the question of conflict in the Arctic from a microscopic view, thus supplementing the dyadic analysis' more macroscopic view.

I will first present a summary of the coding results for these four Arctic disputes, which will be followed by a discussion on coding decisions for variables extrinsic to the particular territories (i.e. those variables stemming from the current international context or the domestic context of the target or challenger country). For example, whether or not a target country has a set of deterrent military alliances in place is a condition that can be derived from the international context rather than the particularities of the disputed territory itself. I separate these coding discussions because I will proceed to perform a case study on each of the disputed territories—which will detail the history of each dispute and the strategic and economic value of the territories involved—following the general summary tables of the coding decisions.

Figure 10 itemizes the coding decisions for the four Arctic disputes. Given the number of independent variables, the graph was broken up into two tables. I coded the conditions for each country in the dyad in the dispute since either country could fill the "challenger" role by being the country that chooses to escalate by advancing its military forces. The one exception is Canada in its dispute with the U.S. over the Northwest Passage since the passage is encompassed within its territory, where Canada's navy would be allowed to operate whether or not the passage is considered sovereign or international waters. In other words, Canada cannot "go on the offensive" to "take" the passage, which means it can only be understood as the target country.

Several of the coding results are worth discussing here. First, every country aside from Russia is currently involved in at least one other dispute with another country, and at least one of those disputes functions as a military stalemate. For these countries, coding for these disputes arises from their current or recent involvement in Iraq or Afghanistan (which matches the criteria for a stalemate) and, more recently, the joint operations in Libya (Tancau 2011; Buley 2011; NDCF 2011; US Dept. of Defense 2009). Canada, which has withdrawn from Afghanistan, is the only country that is tied down in more than one Arctic dispute, which constitutes half of the value for its *Other Disputes* variable (CBC News 2010a). Although Russia has been mildly involved in a supporting role with the war in Afghanistan, in that it has allowed other countries to use its bases or has helped mitigate drug trafficking, it currently has no involvement in combat operations within Afghanistan or against Libya, rendering the value of its *Other Disputes* variable 0 (Russia Today 2010; Okorokova 2011). Moreover, its last conflict in the five day South Ossetian War was deemed a victory, giving it a score of 0 for the category of *Military Defeat or Stalemate* (Sultan 2008).

Second, each country received a value of 1 for common security ties and deterrent military alliances. For every country but Russia, this stems from these countries' involvement in NATO and other bilateral and multilateral treaties they have with each other. For the dispute involving Norway, Russia also receives a 1 for common security ties because the two countries have recently increased their military cooperation with each other—for example, taking part in joint naval exercises (O'Dwyer 2011). Third, the coding for military balance of conventional forces does not appear to contradict any of the "general wisdom," so to speak, on the general estimates of each country's respective strength. Being the world's superpower, it is not surprising that the United States is much stronger militarily compared with Canada, and that Canada is much stronger military than a smaller country like Denmark. Moreover, although Russia's military has decayed substantially since the end of the Cold War, exporting large numbers of its

arms, it is not a complete surprise to see that Russia—according to Huth’s coding criteria—is still stronger militarily than Norway (SIPRI 2005; Singer et al 2010). This trend of decay may soon start reversing, as the Russian military has recently begun to consider importing arms from the West, such as a new frigate from France and new armored vehicles from Italy, which may improve the Russian military’s overall strength in the future (Tack 2010).

In terms of democratic norms, the converted POLITY IV data gives high marks for U.S., Canada, Norway, and Denmark, thus matching the general trend of the Freedom House scores listed in the dyadic analysis (see Section 3.2). Russia, however, has only been rated as relatively democratic for seven of the past twenty-five years, which is consistent with its passable—but not

Dispute	Challenger	Target	Constant	Selection Effects	Military Balance of Forces	Deterrent Military Alliances	Other Disputes	Ties	Strategic Value	Military Defeat or Stalemate
Beaufort Sea	Canada	United States	1	1.246	0.226782498	1	2	1	1	1
	United States	Canada	1	1.246	0.773217502	1	4	1	1	1
Hans Island	Canada	Denmark	1	1.246	0.733003137	1	2	1	0	1
	Denmark	Canada	1	1.246	0.266996863	1	2	1	0	1
Barents Sea	Norway	Russia	1	1.246	0.389591957	1	2	1	1	1
	Russia	Norway	1	1.246	0.610408043	1	0	1	1	0
	United States	Canada	1	1.246	0.773217502	1	4	1	1	1

Dispute	Challenger	Target	Minority	Unification	Democratic Norms	Prior MIDs	Status Quo	Economic Value	Stalemate in negotiations
Beaufort Sea	Canada	United States	0	0	25	0	1	1	0
	United States	Canada	0	0	25	0	1	1	0
Hans Island	Canada	Denmark	0	0	25	0	0	0	0
	Denmark	Canada	0	0	25	0	0	0	0
Barents Sea	Norway	Russia	0	0	25	0	1	1	0
	Russia	Norway	0	0	7	0	1	1	0
	United States	Canada	0	0	25	0	0	0	1

Figure 10: Coding results for the four Arctic disputes. *Other Disputes* stands for how many other military or territorial disputes the challenger is involved in (aside from the one being coded), *Ties* stands for common security ties, *Minority* stands for ties to minorities, *Unification* stands for political unification, *Prior MIDs* stands for prior militarized interstate disputes in the dyad, and *Status Quo* stands for attempts by target to change status quo.

stellar—most recent Freedom House score (CSP 2011).

Lastly, before delving into the case studies of the Arctic disputes, it is important to briefly discuss the category of *Selection Effects*. While constituting an independent variable for the purposes of the ordered probit analysis, this variable does not stem from the hypotheses generated under Huth's modified realist paradigm. Rather, this is an error term that accounts for selection bias: when countries first enter into a territorial dispute, they do so for some reasons and not others. That said, the same reasons that the countries first initiated the territorial dispute may influence the reasons they escalate the dispute to militarized conflict; this self-selection effect would have to be accounted for to keep the results statistically valid (Huth 1996, 262). However, while I have access to the coding data from Huth's dataset on territorial dispute initiation (see CIDCM 2011), Huth never specifies how he uses that data to calculate the selection effect for the dataset on territorial dispute escalation. Therefore, I used the STADA v.10 program to calculate the mean selection effect from his dataset on dispute escalation ( $x = 1.246$ ) and coded that value for each of the Arctic disputes. Although this introduces more uncertainty into the final probability scores, using the mean minimizes the standard error better than the alternative of simply leaving out the variable from the final calculation of the predicted probability scores.

Now that the coding decisions have been discussed for the general variables unrelated to the particularities of the Arctic territorial disputes themselves, I will turn to the case studies to contextualize these disputes and discuss both the remaining coding decisions and the resulting probability scores.

#### 4.2. U.S. and Canada: Beaufort Sea Maritime Border

The history of this dispute has its origins in an 1825 treaty signed between Great Britain and Russia over a demarcation line between Russia's Alaskan territory and Britain's territory in Canada. Originally written in French, the Treaty of St. Petersburg used vague language on the limits of the border (Sands 2010, 209). However, this dispute did not come to fruition until the 1970s, when the prospect of Exclusive Economic Zones extending 200 miles from shore under UNCLOS became a possibility. And yet, even then, the dispute barely even reached a simmer as "there was previously no pressure to resolve a border in a remote, icy, inhospitable region" (Griffiths 2010). At stake is more than just 21,500 square kilometers of open sea and local fisheries. Approximately 1.7 billion cubic meters of natural gas and 1 billion cubic meters of oil lie in the disputed territory alone, as well as a undersea ridge that may extend further north to the North Pole, potentially allowing increased legal access to even more natural resources (Griffiths 2010; Vancouver Sun 2010). As climate change makes development more possible, Canadian and U.S. officials have seen tensions rise (Boswell 2009).

Yet, despite a recent survey that found that a majority of Canadians want to see a stronger response from the Foreign Ministry in Canada asserting its "full sovereign rights over the Beaufort Sea," diplomats have continued to meet and joint exploration exercises have been conducted (EKOS 2011, 39; Griffiths 2010). Both the Americans and Canadians have pledged to look for "win-win" solutions, and on-going talks have proven "productive," according to an U.S. embassy official (Mahoney 2011).

Therefore, this dispute was coded a positive value of 1 for economic value, strategic value, and attempts to change the status quo, as both the U.S. and Canada have been actively mapping the territory and searching for mineral deposits (CBC News 2010b). On the other hand, it was coded a 0 for diplomatic stalemate, political unification, and minority ties (since no ethnic minorities inhabit the Beaufort Sea). Given these coding decisions, Huth's model would suggest

the chance of Canada escalating the dispute is 3.7% and the chance of the U.S. escalating the dispute is 5.7%.<sup>5</sup> This means there is a greater than 90% chance that diplomacy will mediate the interactions on this issue.

These results are not surprising, as they match the moderate amount of diplomatic tensions between the two states, which most directly stem from domestic linkages in Canada. Aside from the structural conditions of the U.S.-Canadian bilateral relationship, one possible explanation for this cooperative outlook—which, it should be noted, rejects an opportunity for political entrepreneurs to galvanize support by exploiting a source of national pride—is that Canada wants to have stable borders before their submission on continental shelves to UNCLOS in 2013, thus allowing them to potentially develop at least part of the area. Some evidence exists for this view, as Canadian officials have already begun considering bids from multiple energy firms looking to develop the petroleum reserves there (Griffiths 2010; Vancouver Sun 2010).

#### *4.3 Canada and Denmark: Hans Island*

Named by American explorer Charles Francis Hall after Hans Hendrik, an Inuit member of his expedition who helped Hall discover the island in 1915, Hans Island lies in the Nares Strait between Greenland and Canadian-held Ellesmere Island. It is roughly two square-kilometers of barren rock that claims as its only inhabitants transient parties of scientists and researchers (Harper 2005a). Despite oil and gas reserves being prevalent in the proximate Arctic region, Hans Island, it was discovered, does not have any promising signs of petrochemical reserves. Canada's Geological Service sampled rocks from Hans Island, Ellesmere Island, and nearby parts of Greenland, and they subsequently discovered that the rocks were geologically formed in temperatures far too low to produce oil and gas (Mayes 2005). Yet, a dispute has been registered since 1973, when Canada and Denmark set out to make a delimitation treaty between Canada and Greenland.

At the time, the two countries were unable to agree on the status of Hans Island and therefore left the demarcation line at the low water mark on the north and south sides of the island. Within several years, a Canadian oil firm began research on the island, looking at how well the island resisted stress from ice flows in order to translate this knowledge for the construction of artificial islands (Stevenson 2007). When Denmark discovered this operation in the 1980s, the Danish Minister of Greenland flew to the island to erect a Danish flag and deposit a bottle of schnapps. This sparked a decades-long "battle of the bottles," where Canadian and Danish visitors alike would visit the island and leave a bottle of their favorite libations (Harper 2005a). In 2005, Canada escalated the otherwise subdued dispute by sending Canadian Forces by helicopter to replace the Danish flag with a Canadian one and construct an Inuit stone marker, in what was ostensibly a demonstration of the government's commitment to Arctic sovereignty. The Danes leveled a diplomatic protest, but remained open to further communication and consultation according to the Danish Ambassador in an open letter to the Canadian media (Killaby 2006; Kristensen 2005). Canadian emissaries did not meet with their Danish counterparts on this issue until 2009, downgrading the dispute from a potentially militarized standoff to high-level negotiations

---

<sup>5</sup> The slight difference in scores is most likely due to the United States' overwhelming balance of conventional military forces, which has a higher marginal impact on increasing the probability of  $y = 2$  than the number of other disputes the challenger is involved in (Huth 1996, 115). *Military Balance of Forces* and *Other Disputes* are the only variables coded differently between these two countries for this dispute.

(Byers 2009a). To date, the dispute has not been resolved, but Canadian Prime Minister Harper has stated that talks on the matter have been progressing well (Iverson 2010).

Could Hans Island be a flashpoint for conflict between Canada and Denmark? First of all, it has no inhabitants, no resources, and no strategic value, earning those respective variables a value of 0. On the last point concerning strategic value, it should be noted that, while the island sits in the middle of the long Nares Strait that straddles Greenland and Ellesmere Island, the undisputed part of the Canadian-Denmark line of demarcation leaves the island without any territorial water (Harper 2005a). Therefore, access of the island itself—navigable on both sides—has no bearing over legal control of the straits. No country could create a blockade or choke point by gaining unilateral control of the island, thus constituting the rationale behind the coding of 0 for strategic value. And second, since 2005, there have not been any attempts to change the status quo on the island as negotiations have been progressing, thereby leading to values of 0 for *Status Quo* and *Stalemates in negotiations* (Iverson 2010).

Given these coding decisions, Huth's model suggests that the probability for Canada escalating to militarized conflict is 2.5% and the probability for Denmark escalating to militarized conflict is roughly 1%. Although these auspicious probability scores match the relatively low levels of tensions on this dispute at the time of this writing, it raises the question why Canada originally chose to escalate the diplomatic conflict in 2005.

The answer lies in a combination of symbolic national pride and misperception. In 2005, Canada's Liberal government decided to respond to criticisms that it had not paid enough attention to Arctic matters, such as encroachments on sovereignty, by sending forces to Hans Island. This domestic linkage was not broken when Prime Minister Harper took office, as he made clear his stance on the Arctic was that Canada must "use it or lose it" (Sands 2010, 217). To make matters worse, policy experts had been informing policymakers and diplomats that the Danes were posturing for greater control of the Arctic to exploit natural resources—Hans Island was simply a test for Canada to overcome by demonstrating its strength and commitment to what it perceived as its territory. This would thereby prevent a contagion scenario where other nations view Canada as a "weak" player (Boswell 2008; Killaby 2006). That said, while anxieties over a polar rivalry with Denmark have subsided gradually as negotiations and confidence-building measures have continued, Hans Island remains a fortuitous, yet persistent, manifestation of national pride. Thus, the Canadian government has found itself in a bind, where Canada wishes to signal to its partners "its willingness to solve boundary disputes through diplomacy" while invoking a sense of nationalism when "targeting the domestic audience" (Gurzu 2010, 1).

Looking back to the dyadic analysis, this pattern of domestic linkages influencing international behavior is not surprising, since Canada and Denmark have one of the weakest relationships of all the dyads, albeit a relationship not so tainted, damaged, or worthless as to justify conflict as a real near-term possibility. As some observers have noted, the Hans-Island dispute represents the classic case of a "steel fist in a velvet glove"—the governments want cooperation, but must confront the realities of anxieties over competition and, in Canada's case, resurgent national pride over Canadian sovereignty in the Arctic (Gurzu 2010, 1).

#### 4.4. Norway-Russia: The Barents Sea Maritime Border

In April 2010, Russian president Dmitry Medvedev and Norwegian Prime Minister Jens Stoltenberg announced in a surprising move that their long-standing, forty-year dispute over the maritime delimitation boundary in the Barents Sea was over (Gibbs 2010). This dispute began in

1970 when Norway proposed to set the maritime boundary between itself and the then-Soviet Union; the Soviets disagreed, instead wishing to divide the line along sectors, leading to “the existence of a disputed area of 175,000 square kilometers” (Elferink 1997, 8). While the Soviet Union was unwilling to compromise on the maritime border, the two states were able to create a provisional agreement concerning the management of nearby fisheries, which yield roughly 4.5 million tons of fish annually. The effect of this agreement was that it muffled any diplomatic urgency to pursue a resolution on the maritime delimitation. Again in 1988, diplomatic talks were resumed, with the USSR proposing a joint development of the known and significant petroleum deposits in the seabed without prejudice to the demarcation line. Norway rejected this proposal as well, wishing to see a resolution to the maritime boundary, heralding a twenty-year span of diplomatic gridlock (Henriksen & Ulfstein 2011). Then, in 2007, diplomatic talks resumed and the countries made an immediate breakthrough, agreeing on a way to divide up all but 20% of the disputed territory, which was estimated to hold the largest reserves of petroleum (Byers 2009b). Three years later, the dispute has been more or less resolved with the Barents Sea Treaty, which now only awaits ratification by Russia’s State Duma (Nilsen 2011).

Had one applied Huth’s model to the Barents Sea dispute prior to resolution, one would code a 1 for economic value, 1 for strategic value given its proximity to sea lanes, 0 for political unification and minority ties, 0 for stalemate in negotiations, as they had been progressing since 2007, and 1 for changes in the status quo, as both countries had been actively mapping and searching for more oil and gas as negotiations proceeded (Elferink 1997; GRID-Arendal 2008). From this, Huth’s model states that there was a 4.9% chance of Norway escalating the dispute into a militarized conflict, and a 19.997% chance of Russia escalating the dispute. Although this is the highest predicted score registered for any Arctic dispute, the odds were still overwhelmingly in favor of diplomacy mediating the dispute. And, as the odds should have it, low-level diplomacy has been the *modus operandi* for the majority of the years this maritime border has been in dispute (Henriksen & Ulfstein 2011). The two main factors that increased Russia’s propensity for conflict was the fact that it had won its last conflict, and that it was not currently entangled in any other dispute other than the one with Norway. Thus, based off of Huth’s model, its cost for going to war was lower and thus the likelihood for militarized conflict increased.

That said, the fact that it did not resort to military action is a telling litmus test of Arctic geopolitics, in that it empirically confirms that cooperation can occur in spite of pressures—real or perceived—for there to be a resource race to the Arctic. As Norwegian Prime Minister Stoltenberg stated, “this is a confirmation that Norway and Russia, two large polar nations, do not have a policy about racing, but a policy about cooperation” (Gibbs 2010, A10). Recalling that the Russia-Norway dyad was selected earlier in this paper as one of the ‘weaker’ dyads, evidence of cooperation even among more conflict-prone nations, relatively speaking, demonstrates that cooperation among the stronger dyads will most likely be the dominant trend for any future disputes.

#### *4.5 U.S. and Canada Revisited: The Northwest Passage*

Aside from the maritime boundary conflict in the Beaufort Sea, the U.S. and Canada have one other territorial dispute that is more unique than the rest. While still constituting a territorial dispute, it involves control or sovereignty over an internal region rather than the placement of a border—namely, the Northwest Passage. The Canadian government maintains that the Northwest Passage falls directly under its jurisdiction, while the United States, among others like China and

Europe, insist that it is international waters and Canada should allow the U.S. military to freely navigate and conduct operations in the area (Gluck 2010).

This dispute began in 1985, when USCGC *Polar Sea* passed through the Northwest Passage unannounced after returning from a routine resupply to a U.S. Air Force base in Thule, Greenland. When it was discovered that the U.S. icebreaker had traversed the Northwest Passage, Canadian public outcry was stentorian. The outrage was so palpable that reports exist of private Canadian planes flying over the *Polar Sea*, dropping messages and miniature Canadian flags onto its deck (Schulman 2007, 63). Moreover, the government attempted to match the public's fulminations by commissioning new icebreakers to be built and by declaring legal "baselines" around the Canadian archipelago as internal territorial waters (Schulman 2007, 65). Diplomatic talks with the United States ensued, but the nations essentially decided to "agree to disagree" (Ebinger & Zambetakis 2009, 1221). Yet, as ice in the Northwest Passage has thawed, Canada has now become unsure of its sovereignty and control of the waters inter-splicing its archipelago, especially in light of shaky legal arguments supporting Canada's claim to internal waters (Parker & Madjd-Sadjadi 2010, 339-340). This insecurity has led Canada to commission the development of even more icebreakers and ice-retrofitted patrol vessels to assert its sovereignty in the passage (Hansen 2007). Diplomatically there has yet to be any further progress with the U.S. or any other country, for that matter.

Could this dispute over access and control—in other words, the manifestations of sovereignty proper—serve as a flashpoint for conflict? The territory is certainly strategic (1), negotiations have not budged, as both sides have "agreed to disagree" on the matter (1), there has been no proven reserves of natural resources within the disputed waters of the Northwest Passage (0), and no minority populations inhabit the waters either, resulting in a coding of 0 for those variables (USGS 2008). Given these conditions, Huth's model would suggest that there is a 14.5% chance the United States will engage Canada militarily over the status of the Arctic. This is, then, to say that diplomatic engagement is still the most likely outcome, which matches the United States and Canada's off-and-on negotiations on this matter.

Yet, it is important to note that this dispute is qualitatively different than most border disputes—neither the United States, nor any other country, is attempting to assert *their* sovereignty over the Northwest Passage, but rather to attenuate Canada's sovereignty over the corridor. Since the threats to Canada's claim have all existed within legal channels, Canada's build-up of polar vessels should not be understood as a means to prevent invasion, but as a way to substantiate its claim that the waters are indeed internal territorial waters (Winnipeg Free Press 2011). Moreover, when placed in the context of dyadic analysis with the United States, who is the primary plaintiff figuratively speaking, it is unlikely that Canada will do anything to significantly reverse its strong relationship, even if it is willing to irk its neighbor to the south on this issue. This puts to rest any concerns of armed conflict, if one were to view the predicted probability score of 15% for armed conflict as "unusually high" between these two generally amicable neighbors. Therefore, the evidence suggests that the Northwest Passage will remain a matter of diplomatic contention, at least with the United States, for the foreseeable future.

## 5. Conclusion

This research sought to test the claims made by Borgerson and other realists who speculated a nascent Arctic resource race would erupt into outright conflict. The results of this research suggest that, instead, a clear trend of cooperation has begun to emerge. In only two of the

quantitative simulations were the chances for militarized conflict above 10%, and one of those disputes—Russia and Norway in the Barents Sea—has been more or less resolved at the time of this writing, while the other dispute—the U.S. and Canada over the Northwest Passage—is situated within one of the strongest interstate dyads. Moreover, the dyadic analysis suggests that *all* of the dyads are relatively strong, especially with respect to open trade, levels of democracy, and normalized relations. It should be noted that at no point did any of these countries retract or withdraw diplomatic envoys—a sign of a severe or catastrophic breakdown in diplomacy—during the course of any of the studied territorial disputes.

However, this research does reveal a slightly less reassuring trend regarding Canada and, to a lesser extent, Russia. Not only is Canada embroiled in three of the four current Arctic disputes, but it is also part of two of the weakest dyads identified in the dyadic analysis. Indeed, it appears that, when compared to the other Arctic nations, it is the most aggressive nation-state, even more so than the oft-distrusted Russian bear (whose most portentous indicator of conflict—the nearly 20% chance of armed conflict with Norway—has been muted by a recent treaty formally resolving the dispute). Should policymakers be concerned? Does Canada pose a threat to Arctic security and cooperation?

I would conclude from this research that the answer is no. First, it is important to note the motives behind Canada's bellicose rhetoric and aggressive diplomacy: domestic linkages stemming from notions of Canadian pride. As both historical examples and polling data have demonstrated, Canadians respond vociferously to encroachments on their northern territories, as they perceive the Arctic to be intrinsic to, and formative, of their national identity (EKOS 2011). This renders their direction of aggression towards a defensive posture, rather than an offensive one. If anything, Canada's rugged and deliberate reinforcing of clear-cut borders and sovereignty in its Arctic territory may serve to further stabilize the region by upholding Westphalian conceptions of interstate interactions, thereby directly answering Borgerson's fears of a semi-anarchic polar region. Second, two of the current territorial disputes in which Canada is engaged are with the United States over a maritime border in the Beaufort Sea and control over the Northwest Passage. Given the strength of the U.S.-Canada dyad, it seems unlikely these disputes will be resolved through anything other than diplomacy. Moreover, as the domestic fervor with regards to Hans Island cools off, and with Norway and Russia already in agreement with their border, it appears that these territorial disputes—which could have at one time served as flashpoints for conflict—are quickly becoming artifacts in their respective countries' diplomatic history.

Critics may point out that there are minor discrepancies between the predictive probability scores and the dyads, in that one of the highest probability scores for conflict—e.g. the roughly 15% chance of conflict over the Northwest Passage—is associated with what this research identified to be the strongest dyad (e.g. the U.S. and Canada). Could this, then, suggest a flaw with either the findings or the methodology?

Again, my answer is no. Such mild discrepancies are not inconsistent results because they operate at different levels; just because a dispute exists between a portentous dyad does not mean that that particular dispute has the requisite conditions to turn it into an explosive militarized conflict, and vice versa. Moreover, since all of the predicted probability scores are relatively low, and the dyadic analysis came to similar conclusions vis-à-vis the dyads (i.e. that each of the dyads are—by and large—stable in absolute terms), the findings of the two approaches are in fact quite harmonious.

It is worth mentioning that this research should be understood as the next step, rather than the final one, in Arctic geopolitical research that seeks either to test claims made in the literature

by other scholars or to make future projections on the course of Arctic geopolitics. As noted earlier in the methodology section, notable omissions like China have been made in this research, omissions which should be addressed in due time given the growing size and stature of East Asian economies and militaries—not to mention their relatively close geophysical proximity. Enhanced dyadic analysis of East Asian countries with respect to the Arctic states may prove invaluable, as the question shifts from the possibility of internal conflict among Arctic states to external conflict with outsiders.

On a final note, I wish to situate this research in relation to the broad based literature on environmental-related conflicts. While the individual causes for particular conflicts in the Arctic could be myriad, the heart of this research—in terms of both why it is important and why the question of conflict has arisen in the first place—relates to the exogenous shock of climate change entering into the biophysical and geopolitical realm of the Arctic. In this respect, then, this research speaks to the issue of environment-driven conflict. While several theorists have argued that the presence of environmental goods and natural resources cause conflict, insofar as it provides the impetus and financial rationale to engage in costly acts of war, the case of the Arctic as it is so far—and how it is projected—suggests that one must qualify the "honey-pot" hypothesis that views resources as a curse rather than a blessing (see de Soysa 2002). Policymakers have demonstrated that they share the same anxieties towards the prospect of a new abundance of resources opening up in the Arctic in places like the Barents Sea, Beaufort Sea, and elsewhere. Indeed, as mentioned earlier in this paper, the Arctic states have essentially come to the table with steel fists hidden in velvet gloves. And yet, despite the media hype of the Russian flag stunt or the intrusion of U.S. naval vessels in alleged Canadian waters, the gloves have stayed on—cooperation, not conflict, has been the predominant *modus operandi* in Arctic geopolitics. And, with any luck, it will remain that way in the coming decades.

**Works Cited**

- Arteaga, Jessica, and Cassandra Clough. 2011. "The Risks Associated with Thawing Permafrost." *The GLG 216 Journal* 1 (1).
- Backus, George A. and James H. Strickland. 2008. *Climate-derived tensions in arctic security*. Albuquerque, NM: Sandia National Laboratories, SAND2008-6342.
- Baker, John Norman Leonard. 2000. "Item Display: 1871-1880 (Volume X)." February 26. [http://www.biographi.ca/009004-119.01-e.php?&id\\_nbr=5136](http://www.biographi.ca/009004-119.01-e.php?&id_nbr=5136) .
- Barry, R. G. 1983. "Arctic Ocean Ice and Climate: Perspectives on a Century of Polar Research." *Annals of the Association of American Geographers* 73 (4) (Dec.): pp. 485-501.
- Bayer, Reşat. 2006. "Diplomatic Exchange Data set, v2006.1." March 16, 2011. <http://www.correlatesofwar.org/> .
- Boswell, Randy. 2008. "Beware Danes' Agenda, Canada Warned," *Ottawa Citizen*, May 27, 2008. A5.
- 2009. "Canada files protest over U.S. fishing ban in Arctic Ocean." March 13. <http://www.canada.com/news/Canada+files+protest+over+fishing+Arctic+Ocean/1959483/story.html> .
- Bremer, Stuart A. 1992. "Dangerous Dyads: Conditions Affecting the Likelihood of Interstate War, 1816-1965." *The Journal of Conflict Resolution* 36 (2) (Jun.):pp. 309-341.
- Byers, Michael. 2009a. "Breaking the Ice," *Ottawa Citizen*, October 27, 2009.
- 2009b. "Norwegian-Russian swap deal in the Barents Sea?" March 15. <http://byers.typepad.com/arctic/barents-sea/> .
- Carpenter, Brent. 2009. "Warm is the New Cold: Global Warming, Oil, UNCLOS Article 76, and how an Arctic Treaty might Stop a New Cold War." *Environmental Law* 39 :215-252.
- CBC News. 2010a. "Canadian troops mark final combat rotation." November 27, 2010. <http://www.cbc.ca/news/world/story/2010/11/27/afghanistan-troop-rotation.html> .
- 2010b. "Canada, U.S. map disputed seabed." Tuesday, July 27, 2010. <http://www.cbc.ca/news/canada/north/story/2010/07/27/north-beaufort-sea-mapping.html> .
- Center for International Development and Conflict Management. 2011. "Replication data for: Standing Your Ground: Territorial Disputes and International Conflict." April 24, 2011. <http://dvn.iq.harvard.edu/dvn/dv/phuth/faces/study/StudyPage.xhtml?studyId=655> .

- Center for Systemic Peace (CSP). 2011. *Polity<sup>TM</sup>IV: Political Regime Characteristics and Transitions, 1800-2009* 4 <http://www.systemicpeace.org/>. (April 18, 2011).
- Central Intelligence Agency (CIA). 2011. "The World Factbook: Country Comparison: Oil Reserves." February 25. <https://www.cia.gov/library/publications/the-world-factbook/rankorder/2178rank.html> .
- Chapman, William, and John E. Walsh. 2007. "Simulations of Arctic Temperature and Pressure by Global Coupled Models." *Journal of Climate* 20 (4): 609-632.
- Chivers, C. J. 2007. "Russians Plant Flag on the Arctic Seabed." March 14. The New York Times. <http://www.nytimes.com/2007/08/03/world/europe/03arctic.html> .
- Cohen, Ariel. 2007. "Russia's Race for the Arctic." *WebMemo*(1582) (August 6, 2007):1-2.
- Cornell, Hans. April 29, 2008. "The North is not the Wild West." February 26. [http://arctic-council.org/article/2008/4/the\\_north\\_is\\_not\\_the\\_wild\\_west](http://arctic-council.org/article/2008/4/the_north_is_not_the_wild_west) .
- Crescenzi, Mark J. C. 2006. *Reputation and Interstate Conflict (Of Friends and Foes)*. University of North Carolina, Chapel Hill, Dept. of Political Science.
- Croco, Sarah E., and Tze Kwang Teo. 2005. "Assessing the Dyadic Approach to Interstate Conflict Processes: A.k.a. "Dangerous" Dyad-Years." *Conflict Management and Peace Science* 22 (1) (February 01): 5-18.
- de La Fayette, Louise Angelique. 2008. "Oceans Governance in the Arctic." *The International Journal of Marine and Coastal Law* 23 10.1163/092735208X331908.
- Ebinger, Charles, and Evie Zambetakis. 2009. "The Geopolitics of Arctic Melt." *International Affairs* 85 (6):1215-1232.
- Ekos Research Associates, Inc. (EKOS). 2011. *Top of the world: Arctic security public opinion survey*. The Walter and Duncan Gordon Foundation and the Canada Centre for Global Security Studies at the Munk School of Global Affairs, .
- Elferink, Alex G. 1997. "The Law and Politics of the Maritime Boundary Delimitations of the Russian Federation: Part 2." *The International Journal of Marine and Coastal Law* 12 (1):5-35.
- Energy Information Administration (EIA). 2009. *International energy outlook 2009*. Washington, D.C.: U.S. Department of Energy, Office of Integrated Analysis and Forecasting, DOE/EIA-0484(2009). Gartzke, Erik, and Quan Li. 2003. "Measure for Measure: Concept Operationalization and the Trade Interdependence-Conflict Debate." *Journal of Peace Research* 40 (5) (September 01):553-71.

- Gartzke, Erik, and Quan Li. 2003. "Measure for Measure: Concept Operationalization and the Trade Interdependence-Conflict Debate." *Journal of Peace Research* 40 (5) (September 01):553-71.
- Gerhardt, Hannes, Philip E. Steinberg, Jeremy Tasch, Sandra J. Fabiano, and Rob Shields. 2010. "Contested Sovereignty in a Changing Arctic." *Annals of the Association of American Geographers* 100 (4):992-1002.
- Ghosn, Faten, Glenn Palmer, and Stuart A. Bremer. 2004. "The MID3 Data Set, 1993–2001: Procedures, Coding Rules, and Description." *Conflict Management and Peace Science* 21 :133-154.
- Gibbs, Walter. 2010. "Russia and Norway Reach Accord on Barents Sea," *The New York Times*, April 28, 2010 A10.
- Gluck, Aaron. 2010. "The Polarizing North Pole." February 26. <http://www.coha.org/the-polarizing-north-pole/> .
- GRID-Arendal. 2008. "Extraction activities and disputed areas in the Barents Sea." April 29, 2011. [http://maps.grida.no/go/graphic/extraction\\_activities\\_and\\_disputed\\_areas\\_in\\_the\\_barents\\_sea](http://maps.grida.no/go/graphic/extraction_activities_and_disputed_areas_in_the_barents_sea) .
- Griffiths, Sian. 2010. "US-Canada Arctic border dispute key to maritime riches." March 13. <http://byers.typepad.com/arctic/2010/08/us-canada-arctic-border-dispute-key-to-maritime-riches.html> .
- Gurzu, Anca. 2010. "New Arctic policy involves 'good cop-bad cop' strategy." March 15. <http://www.embassymag.ca/page/view/arctic-08-25-2010> .
- Halden, Peter. 2007. *The geopolitics of climate change: Challenges to the international system*. Stockholm, Sweden: FOI, Swedish Defence Research Agency, FOI-R--2377--SE.
- Harper, Kenn. 2005a. "Hans' history." March 15. <http://www.canadiangeographic.ca/hansIsland/background.asp> .
- 2005b. "Give it to Denmark." July 27 <http://byers.typepad.com/arctic/2008/11/give-it-to-denmark.html> .
- Harris, Jerry. 2005. "Emerging Third World Powers: China, India and Brazil." *Race & Class* 46 (7): 7-27.
- Hegre, Håvard, John R. Oneal, and Bruce M. Russett. 2010. "Trade does Promote Peace: New Simultaneous Estimates of the Reciprocal Effects of Trade and Conflict." *Journal of Peace Research* 47 (6): 763-774.

- Heininen, Lassi, and Heather N. Nicol. 2007. "The Importance of Northern Dimension Foreign Policies in the Geopolitics of the Circumpolar North." *Geopolitics* 12 (1):133-165.
- Henriksen T., and Ulfstein G. 2011. "Maritime Delimitation in the Arctic: The Barents Sea Treaty." *Ocean Dev.Int.Law Ocean Development and International Law* 42 (1-2):1-21.
- Hensel, Paul R. Spring 1996. "Charting A Course to Conflict: Territorial Issues and Interstate Conflict, 1816-1992." *Conflict Management and Peace Science* 15 (1) (Spring 1996):43-73.
- Hollis, Daniel J., and Tatjana Rosen. 2010. "United Nations Convention on the Law of the Sea (UNCLOS), 1982." February 25.  
[http://www.eoearth.org/article/United\\_Nations\\_Convention\\_on\\_Law\\_of\\_the\\_Sea\\_%28UNCLOS%29,\\_1982#gen0](http://www.eoearth.org/article/United_Nations_Convention_on_Law_of_the_Sea_%28UNCLOS%29,_1982#gen0).
- Huth, Paul. 1996. *Standing your ground: Territorial disputes and international conflict*. Ann Arbor: The University of Michigan Press.
- International Hydrographic Organization. 1953. *Limits of oceans and seas*. Monte Carlo.
- International Monetary Fund (IMF). 2010. *World Economic Outlook Database*.  
<http://www.imf.org/external/pubs/ft/weo/2010/02/weodata/index.aspx>.
- 2011. *Direction of Trade Statistics*. <http://www2.imfstatistics.org/DOT/>.
- Iverson, John. 2010. "Hans Island Appears Headed for Joint Custody," *National Post*, November 9, 2010.
- Jeffers, Jennifer. 2010. "Climate Change and the Arctic: Adapting to Changes in Fisheries Stocks and Governance Regimes." *Ecology Law Quarterly* 37: 917-978.
- Jervis, Robert. 1976. *Perception and misperception in international politics*. Princeton, N.J.: Princeton University Press.
- Killaby, Guy. 2006. "Great Game in a Cold Climate: Canada's Arctic Sovereignty in Question." *Canadian Military Journal* Winter 2005 – 2006: 31-40.
- LaFeber, Walter. 2008. *America, Russia, and the Cold War: 1945-2006*. Tenth ed. Boston, Massachusetts: McGraw Hill.
- Leggett, Jane A. 2009. *Climate change: Science highlights*. Washington, D.C.: RL34266.
- Lenarcic, D., and R. Reford. 1989. "Sovereignty Versus Defence: The Arctic in Canadian-American Relations." In *Sovereignty and security in the arctic*, ed. Edgar Dosman. New York, New York: Routledge Publishing.

- Lewis, Susan K. 2006. "NOVA Arctic Passage: My Life as an Explorer, by Roald Amundsen." February 26. <http://www.pbs.org/wgbh/nova/arctic/amundsen.html> .
- Mahoney, Jill. 2011. "Dispute over Hans Island nears resolution. Now for Beaufort Sea." March 13. <http://hornorkesteret.wordpress.com/2011/02/06/dispute-over-hans-island-nears-resolution-now-for-the-beaufort-sea/> .
- Mayes, Sarah. 2005. "Faulty theory?" March 15. <http://www.canadiangeographic.ca/hansIsland/geology.asp> .
- Mearscheimer, John J. 2008. "Why we Will Soon Miss the Cold War." In *Conflict after the cold war*, ed. Richard K. Betts. New York, New York: Pearson Education, Inc., 18-33.
- Ministry of Foreign Affairs in the Russian Federation. 2011. "Перечень двусторонних международных договоров Российской Федерации." April 25, 2011. [http://www.mid.ru/bul\\_newsitem.nsf/kartaflat/02.07](http://www.mid.ru/bul_newsitem.nsf/kartaflat/02.07) .
- National Defence and the Canadian Forces (NDCF). 2011. "Operation Mobile." April 29, 2011. <http://www.cefcom-comfec.forces.gc.ca/pa-ap/ops/mobile/index-eng.asp> .
- Nilsen, Thomas. 2011. "Time for ratification in Moscow." March 15. <http://www.barentsobserver.com/time-for-ratification-in-moscow.4884086.html> .
- Nordås, Ragnhild, and Nils Petter Gleditsch. 2007. "Climate Change and Conflict." *Political Geography* 26 :627-638.
- Northern Forum. 2011. "Mission & Structure." February 26, 2011. <http://www.northernforum.org/servlet/content/mission.html> .
- Norwegian Ministry of Foreign Affairs. 2011. Utenriksdepartementets traktatregister." <http://lovdata.no/traktater/> .
- O'Dwyer, Gerard. 2011. "Better Ties For Norway, Russia Cause NATO Strains." April 29, 2011. <http://www.defensenews.com/story.php?i=5783978> .
- Okorokova, Lidia. 2011. "Russia seeks Libya mediator role." April 29, 2011. <http://themoscownews.com/international/20110428/188626109.html> .
- Oneal, John R., and Bruce M. Russett. 1997. "The Classical Liberals were Right: Democracy, Interdependence, and Conflict, 1950-1985." *International Studies Quarterly* 41: 267-294.
- O'Neill, Kate. 2009. *The environment and international relations*. Cambridge, UK; New York: Cambridge University Press.

- O'Rourke, Ronald, Marjorie Browne, Eugene Buck, M. Corn, Carl Ek, Peter Folger, John Frittelli, et al. 2010. *Changes in the arctic: Background and issues for congress*. Washington, D.C.: R41153.
- Parker, Richard D. and Zagros Madjd-Sadjadi. 2010. "Emerging Legal Concerns in the Arctic: Sovereignty, Navigation and Land Claim Disputes." *Polar Record* 46 (4): 336-48.
- Posner, Eric. 2007. "The New Race for the Arctic," *The Wall Street Journal*, August 3, 2007 (accessed February 25, 2011).
- Richard, Glenn A. 2011. "Northwest Passage." SERC Online.  
[http://serc.carleton.edu/sp/library/google\\_earth/examples/northwest\\_passage.html](http://serc.carleton.edu/sp/library/google_earth/examples/northwest_passage.html) .
- Rosenberg, Matt. 2011. "Northwest Passage: Northwest Passage may allow ship travel across Northern Canada." February 26.  
<http://geography.about.com/od/specificplacesofinterest/a/northwestpassag.htm> .
- Russett, Bruce M. 1993. *Grasping the democratic peace*. Princeton, New Jersey: Princeton University Press.
- Russia Today. 2010. "Russia back to Afghanistan to help US & NATO." April 29, 2011.  
[http://www.youtube.com/watch?feature=player\\_embedded&v=XFgcch0MaXA#at=13](http://www.youtube.com/watch?feature=player_embedded&v=XFgcch0MaXA#at=13) .
- Sands, Christopher. 2010. "Canada's Cold Front: Lessons of the Alaska Boundary Dispute for Arctic Boundaries Today." *International Journal* 65: 209-219.
- Scheffran, J. 2008. "Climate Change and Security." *BULLETIN- ATOMIC SCIENTISTS* 64 (2): 19-25.
- Schulman, Zachary Nathan. 2009. "Cryopolitics: The New Geopolitics of the Northwest Passage and Implications for Canadian Sovereignty." Masters of Arts George Washington University.
- Singer, J. David, Stuart Bremer, and John Stuckey. 2011. "National Material Capabilities v. 4.0: Capability Distribution, Uncertainty, and Major Power War, 1820-1965." Peace, War, and Numbers eds. *Russett, Bruce*. 19-48.
- Soper, Daniel. 2011. "Cumulative Distribution Function Calculator for the Standard Normal Distribution." <http://www.danielsoper.com/statcalc/calc55.aspx> .
- de Soysa, Indra. 2002. "Ecoviolence: Shrinking Pie, Or Honey Pot?" *Global Environmental Politics* 2 (4):1-34.
- Stevenson, Christopher. 2007. "Hans Off!: The Struggle for Hans Island and the Potential Ramifications for International Border Dispute Resolution." *Boston College International & Comparative Law Review* 30 :263-275.

- Stockholm International Peace Research Institute (SIPRI). 2005. "SIPRI Arms Transfers Database: Conventional arms imports (most recent) by country." April 29, 2011.  
[http://www.nationmaster.com/graph/mil\\_con\\_arm\\_imp-military-conventional-arms-imports](http://www.nationmaster.com/graph/mil_con_arm_imp-military-conventional-arms-imports)
- Stroeve, Julienne, Marika Holand, Walt Meier, Ted Scambos, and Mark Serreze. 2007. "Arctic Sea Ice Decline: Faster than Forecast." *Geophysical Research Letters* 34: 1-5.
- Sultan, Christopher. 2008. "Six Months after Caucasus War: South Ossetia Becomes Thorn in Russia's Side." April 29, 2011.  
<http://www.spiegel.de/international/world/0,1518,598311,00.html>
- Tack, Sim. 2010. "Russia's outsourcing of arms production." April 29, 2011.  
<http://gcreport.com/index.php/analysis/160-russias-outsourcing-of-arms-production>
- Tancau, Romona. 2011. "Norway involved in Gaddafi bombing." April 29, 2011.  
<http://theforeigner.no/pages/news/norway-involved-ingaddafibombing/>
- U.S. Department of Defense. June 2009. *Measuring Stability and Security in Iraq: Report to Congress in accordance with the Department of Defense Supplemental Appropriations Act 2008*.
- U.S. Department of State. 2010. *Treaties in force: A list of treaties and other international agreements of the United States in force on January 1, 2010*. Washington, D.C.: Office of the Legal Adviser.
- United States Geological Survey (USGS). 2008. "Circum-arctic resource appraisal: Estimates of undiscovered oil and gas north of the arctic circle." 2008. Menlo Park, CA: United States Geological Survey (USGS), 3049.
- Vancouver Sun. 2010. "Canada, US hold secret meetings on Beaufort Sea dispute." March 13.  
<http://menasborders.blogspot.com/2010/07/icebreakers-healy-and-louis-s.html>
- Winnipeg Free Press. 2011. "Beijing's Arctic?" March 15, 2011.  
<http://www.thespec.com/opinion/editorial/article/502008--beijing-s-arctic>
- Yanchar, Stephen C., and David D. Williams. 2006. "Reconsidering the Compatibility Thesis and Eclecticism: Five Proposed Guidelines for Method use." *Educational Researcher* 35 (9) (December 01): 3-12.
- Young, Oran R. 2005. "Governing the Arctic: From Cold War Theater to Mosaic of Cooperation." *Global Governance* 11: 9-15.
- Zellen, Barry. 2009. *Arctic doom, arctic boom*. Oxford, England: Prager.