When is Research Relevant to Policy Making? A Study of the Arctic Human Development report[1]

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Introduction

During the summer of 2009, researchers and practitioners concerned with circumpolar health gathered at an international conference in Yellowknife and heard Nellie Cournoyea, an Inuvialuit leader, recite an all too common message of frustration: research in the North is frequently not relevant to either the people being researched or to public policy (Cournoyea, 12 July 2009). This frustration has long been felt by northerners, and particularly by northern Aboriginal peoples. A quarter century ago, one observer lamented: "The isolation of scientists from the social impacts of their presence has sustained the treatment of the Northwest Territories as a research preserve for the outside academic community" (Biewlawski, 1984, p. 2). This apparent disconnect is explained using a familiar refrain:

> For northerners, science is a source of development or aid; but for federal government officials and university researchers, science and technology are powerful instruments for producing knowledge that facilitates better rational governance. (Bravo, 2009, p. 157)

I think this north-south dichotomy holds decreasing explanatory value. Territorial and Aboriginal governments in the North now hold an array of governance powers, and policy makers in northern governments are also seeking knowledge that facilitates better governance. At the same time, northerners are also more involved in research than ever before.

The influence of northerners on contemporary Arctic research is palpable. For example, research priorities for Canada's contribution to the 2007–2009 International Polar Year (IPY) were established by a steering committee that included numerous northern representatives, and focused on two priority areas: "science for climate change impacts and adaptation" and the "health and well-being of northern communities" (IPY-Canada website 'Research'). It is also telling that the Arctic was the first international region to benefit from a full-scale analysis of climate change (Arctic Climate Impact Assessment [ACIA], 2005). ArcticNet, one of Canada's Networks of Centres of Excellence, espouses as a "major goal" to "engage Inuit organizations, northern communities," as well as other institutions, "as partners in the scientific process and the steering of the Network" (website, About Us).

One may argue that the majority of researchers are still southerners, or that research design insufficiently recognizes indigenous ways of knowing, or that research practices fail to adequately include northerners, or that major research projects are just a snow-wash to attain government funding. As long as these claims go untested, the validity of such conjectures remains uncertain. What we do know is that the participation of northerners in Arctic research — from agenda setting to sample gathering — continues to expand. At the same time, northern policy makers continue to doubt research relevance. In light of this contradiction, it may be worth exploring other explanations.

I argue that the chasm between research and policy in the North is representative of a more fundamental and universal problem: poorly calibrated expectations about the conditions under which research is relevant to public policy.

Poorly calibrated expectations may simply be an honest reflection of how much we know about research-policy relationships. There is much truth in the observation that "political scientists have been shy about teasing out the complex relations between epistemology and political theory" (Bravo, 2009, p. 142). The literature about research-policy relationships is full of reflective pieces, but thin on empirical evidence (Boaz et al., 2009, p. 267). If we want research to be relevant to policy making, then policy mak-

ers and researchers require a better understanding of the conditions under which research is relevant.

This paper seeks to advance our understanding of the conditions under which research is relevant to public policy by drawing upon political studies backed by empirical evidence. It must be noted that the political science literature on research-policy relationships is fractured by theoretical schools of thought. In some ways, my paper is an attempt to look past theoretical divisions to convey comprehensive lessons that hold value for both researchers and policy makers. To this end, the literature's predominant findings are treated as complementary.

After synthesizing what we know, these theories are applied here in an *ex-ante* test to demonstrate how one might go about determining the relevance of research. The body of research under consideration in this paper is the Arctic Human Development Report (2004). The purpose of this case study is to assess how a body of research might be analyzed to determine whether the research in question is relevant to policy making, and why particular judgements about relevance may result. The case study is a table-top exercise and thus carries inherent limitations; at the same time this exercise mirrors the conditions under which policy makers assess the relevance of research. The overall purpose of this paper is to impart a better understanding of the research-policy relationship, and its limits.

Research and Policy

The political influence of science-based boundary organizations (Jasanoff, 1990; Miller, 2001) such as the Intergovernmental Panel on Climate Change (IPCC), have reinvigorated interest in research-policy relationships. Health policy, environmental policy, economic policy, and natural resource policy are all areas where the centrality of research is of growing importance to political decision making (see, for example: Bocking, 2004; Haas, 1997; 1992b). As research matters more to policy making, scholars seek a better understanding of how and why research matters.

Given the wide range of scholarly approaches used to examine research-policy relationships, it is prudent to be clear about the type of relationship under study in this paper. The focus here is on "science for policy" (Brooks, 1964); specifically: What are the conditions under which science may be relevant for policy makers? This paper does not delve into studies that examine "science policy," that is, public policy governing research agendas (e.g., Mooney, 2006; Doern, 1972); nor does it explore tensions between research-

ers and policy makers as separate sociological communities (e.g., Caplan, 1979); this is also not an polemical essay excoriating the risks of ignoring research (e.g., Leiss and Powell, 2004); nor is it a dismissal of those risks (e.g., Collingridge and Reeve, 1986). Again, the focus is on science for policy.

In a northern context, what constitutes research (or science) is a subject of intense debate, owing, in part, to differences between the scientific method and indigenous knowledge systems (Bielawski, 1995). In fact, acknowledging what does and does not constitute "research" can itself lead to conflict (Nadasdy, 2004). It is my explicit intention to acknowledge the importance of this debate, particularly for northern and indigenous communities, but to avoid entry into a debate about what constitutes knowledge. Most of the literature referenced in this paper does not actually refer to "research," but rather to "science." I consider science to be a subset of research, and thus both terms are used interchangeably in this paper; the term science is used more frequently in order to honestly reflect the terminology employed in the literature cited.

I define "research" quite broadly as: "the study of materials, sources, etc., in order to establish facts and reach new conclusions" (*Oxford Canadian Dictionary of Current English*, 2005, p. 709). A robust definition of "policy" needs to encapsulate the centrality of government, denote purposefulness or intention, convey choice or decision making, and remind us that policy decisions carry implications for both public and private actors (Birkland, 2001, p. 20). For the purpose of this study, "policy" is defined as: "an official expressed intention backed by a sanction, which can be a reward or a punishment" (Lowi and Ginsberg, 1996, p. 607).

Theories

Although political science literature cannot tell us exactly when and how research will influence policy, there exists a set of theories that describe the conditions necessary for research to be most relevant to policy making. These theories can be divided between two approaches to social inquiry: rationalist and constructivist. Here is the difference:

> Rationalist: a model of decision-making used to arrive at causal explanations for an action or set of actions, whereby explanations follow a logic of consequences.

> Constructivist: a constitutive set of structural phenomena explored to arrive at a set of conditions that explain the possibility of an action or set of actions, whereby explanations follow a logic of appropriateness.

Each of these approaches is explained in more detail below. Rarely is real policy making characterized by only one approach:

> Sometimes actors do decide by attempting to calculate consequences. On the other side, some choices seem so tightly constrained by webs of norms and roles that they scarcely seem like 'choices' at all. (Fearon and Wendt, 2005, p. 60)

Lumping findings from the existing literature into one of two broad categories helps to parse theoretical conditions into explainable sets. To that end, rationalism and constructivism are useful "analytical lenses for looking at social reality" (Fearon and Wendt, 2005, p. 68).

RATIONALIST THEORIES

The rationalist concept of decision making is strongly rooted in political science (e.g., Axelrod, 1984; Riker, 1962; Buchanan and Tullock, 1962; Downs, 1957; Lerner and Lasswell, 1951). Rationalist approaches help to create useful models of political action. Amongst several assumptions common in rationalist models, one is that actors choose the best course of action available according to a stable set of preferences and having complete knowledge about the consequences of their decisions; in order to do so, an actor is assumed to have available the information necessary to weigh his or her choices. One type of information is research.

A study by Parson (2003) into the creation, evolution, and success of an international regime to reduce and eliminate substances that deplete the ozone layer, made an important distinction between the influence of primary scientific claims and comprehensive scientific assessments.

Primary scientific claims were sometimes able to command issue attention, but were almost exclusively used by political actors to reinforce previously established policy positions (Parson, 2003, p. 263). This finding is consistent with previous studies that portrayed research as a tool wielded by powerful interests in order to gain strategic political advantage (Boehmer-Christiansen and Kellow, 2002; Leiss, 2001; Litfin, 1994; Salter, 1988; Collingridge and Reeve, 1986).

When scientific knowledge was presented in the form of a primary claim, it seldom had the power to shift policy positions. Yet, when scientific knowledge was presented in the form of a comprehensive scientific assessment, and the assessment had a high degree of political legitimacy, or what Parson called "authority," such assessments were capable of resolving long-standing policy disputes (2003, p. 266). Parson explains why:

> The prominent public statement of assessment conclusions, endorsed by powerful institutions, makes the conclusions common knowledge, in the game-theoretic sense that all relevant actors (in policy and scientific domains and on the boundary) do not just know them, but know that others know them, and so on. (2003, p. 267)

"This record indicates," observed Parson, "that scientific assessments can exercise important influence on policy" (2003, p. 266). Producing a scientific assessment is not a guarantee of policy influence, but the assembly of an authoritative assessment appears to maximize the relevance of research in policy deliberations.

Dimitrov built upon this finding, as well as others, and argued that previous studies failed to appreciably disaggregate the idea of scientific knowledge and move beyond the question "does knowledge matter?" to ask "what type of knowledge matters?" (2006, pp. 4–5). In a study of regime formation, he dissected scientific knowledge into three types: scientific knowledge about the extent of an ecological problem; scientific knowledge about the cause(s) of an ecological problem; and scientific knowledge about the consequence(s) of an ecological problem.

His study revealed certain types of information to be more instrumental to policy making than others:

- "Conclusive information about the precise extent of a problem does not appear to be a critical requirement for international policy coordination."

- "Good principal knowledge about particular human-related causes is needed before policy action can be undertaken."

- "[I]nformation about transboundary consequences of a problem is a key factor in international policy making" (Dimitrov, 2006, pp. 157–158) [2]

Information about consequences is a necessary but not sufficient condition in order for research to influence policy making.

These findings (Dimitrov, 2006; Parson, 2003) challenge the broader literature on policy change (Baumgartner and Jones, 2002; 1993; Kingdon, 1984): the influence of information in policy making is not only subject to the unpredictable ebb and flow of issue attention, but is also, to a degree,

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2. There may be a difference between the nature of the relationship that unfolds in international regime formation compared with domestic policy processes (e.g., with legislative coalitions or intergovernmental accords). Although these findings have not been tested in domestic political fora, I contend that the theoretical contributions made by Dimitrov (2006) and Parson (2003) are valuable to our general understanding of the influence of research in the policy process.

determined by the structure and content of the information itself. This, of course, does not mean that having the right type of research design or packaging will automatically result in a policy change. Neither Parson nor Dimitrov make such a claim. It does mean that information about consequences conveyed in a comprehensive scientific assessment can act as an enabling condition to allow for meaningful discussion about a problem, the establishment of actors' interests in addressing that problem, and the delineation of acceptable policy options in response to a problem (Dimitrov, 2006, p. 164). In short, information about consequences conveyed in an authoritative and comprehensive scientific assessment can be policy relevant.

Constructivist Theories

The constructivist school has, historically, been more strongly rooted in sociology, but is gaining prominence in political studies (e.g., Goldstein and Keohane, 1993; Bourdieu and Thompson, 1981; Habermas, 1981; Edelman, 1964). For constructivists, policy making can only be understood within a broader social context, where beliefs, language, signals, and symbols are both the product and producer of reality.

Many constructivists are explicit in their determination not to conceptualize research strictly as an independent variable in the policy process. They seek to explain the two-way relationship between science and policy by investigating "how scientific advice affects the construction and deconstruction of claims" (Jasanoff, 1990, p. 13) and, at the same time, how political frameworks control the production and perceived legitimacy of knowledge (Jasanoff and Martello, 2004b; Social Learning Group, 2001).

Constructivist theories about research-policy relationships are perhaps best summed by the term: "usable knowledge" (Haas, 2004). We do not benefit from a singular definition of "usable knowledge," but the idea has been succinctly described:

> In short, usable knowledge encompasses a substantive core that makes it usable for policy makers, and a procedural dimension that provides a mechanism for transmitting knowledge from the scientific community to the policy world. (Haas, 2004, p. 573).

Usable knowledge is both substantive and procedural; what knowledge gets conveyed is as important as how that knowledge is produced and how it gets conveyed (Haas, 2004; Young, 2002).

The procedural dimension of usable knowledge is strongly influenced by Haas' epistemic communities theory. Epistemic communities are

knowledge-based groups of experts and specialists who share common beliefs about cause-and-effect relationships in the world and some political values concerning the ends to which policies should be addressed. (Haas, 1990, p. xviii)

They are not only experts who agree on the definition of a problem, but who also share some common views on the kinds of solutions best advanced to deal with that problem. In one case, Haas found that epistemic communities "usurped control" over policy making and "shifted policy in accordance with their shared values and understandings" (1990, p. 227).[3] Epistemic communities are knowledgeable and can be powerful.

The substantive core of usable knowledge is thought to exhibit three elements: credibility, legitimacy, and saliency (Haas, 2004, p. 587; see also Clark et al., 2006; Farrell and Jäger, 2006a; Mitchell et al., 2006a; Jasanoff and Martello, 2006a). These three elements are essential to understanding the constructivist literature on research-policy interactions. Whether information is credible or not depends upon the perceived trustworthiness of the source. Credibility can be determined not only by assessing the information itself, but also by assessing the quality and validity of the sources. Legitimacy can be determined by assessing the process used to produce information and whether that process exhibits suitable independence from bias. Finally, whether information is salient or not depends upon whether or not information sufficiently captures the awareness of a person or institution.[4]

SUMMARY

Overall, there is wide spread agreement that research is most relevant to policy making when it is conveyed through a comprehensive scientific assessment. How research agendas are constructed, the methods used to engage in research, as well as the actors who convey the findings, and in what fora, are important considerations in determining the relevance of research to policy. In short, research presented in a comprehensive scientific assess-

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3. The notion of epistemic communities is an enduring concept that has been employed to understand decision making in policy fields that range from arms control to banking (*International Organization* 1992); it has also been adopted within the wider policy literature (e.g., Howlett and Ramesh, 2003; Sabatier, 1999).

4. The absence of precise definitions makes operationalization difficult. As one expert explains, "it is customary to write about salience but less common to define it" (Wlezien, 2005, p. 557). For example, the *Analysis of Global Change Assessments* evaluated the policy relevance of eight different comprehensive assessments and defined salience three different ways (National Research Council of the National Academies [National Academies], 2007, p. 23, 24, 25).

ment that bears the hallmarks of usable knowledge and conveys information about consequences will be most relevant to policy makers.

Methodology

These theories are employed in this paper in a complementary fashion to undertake an *ex-ante* study of a single comprehensive scientific assessment. Starting with the near universal finding that research is most relevant to policy making when it is conveyed through a comprehensive assessment, I examine the policy relevance of a comprehensive scientific assessment: the Arctic Human Development Report (AHDR, 2004). This Report was chosen for two reasons: first, the AHDR has received far less scholarly or popular attention (Forbes, 2006) than other major recent comprehensive scientific assessments devoted to the Arctic region, such as the ACIA (Nilsson, 2007; National Academies, 2007); second, the AHDR is a comprehensive assessment of social science, and, to my knowledge, to date there has been no scholarly analysis of the policy relevance of a comprehensive assessment of social science. This is likely because, unlike assessments of natural and physical sciences, "there is no parallel tradition of conducting scientific assessments in the social sciences" (Young and Einarsson, 2004b, p. 21). It is not known whether lessons derived from studies of natural/physical comprehensive scientific assessments are directly and wholly applicable to social scientific assessments, but this paper begins to press that question.

The purpose of this case study is to assess how a body of research might be analyzed to determine whether the research in question is relevant to policy making, and why particular judgements about relevance may result. Given that the primary purpose of this paper is to illustrate "conditions for relevance," and recognizing the constraints of time and space, the analysis undertaken here is primarily a table-top exercise — more interpretation than irrefutable test.

The AHDR is taken as a standalone document. The processes that resulted in the production of the assessment were not observed by this author, nor were participating researchers or steering committee members interviewed, and policy makers have not been queried about their perspectives on the authoritativeness of this assessment. It must be acknowledged that this table-top approach limits the degree to which constructivist theories can be tested. A more complete constructivist evaluation would require a considerable degree of political ethnography (see: e.g., Nilsson, 2007). That said, it should be possible to evaluate a body of research on its merits, without

becoming a participant-observer in a prolonged assessment process. This is exactly the kind of decision-making context regularly faced by policy makers.

Two questions are pursued in the discussion below:

Does the Arctic Human Development Report constitute usable knowledge?
An assessment conveys usable knowledge if the producers of the assessment are viewed by the user as legitimate; the sources of knowledge and the researchers involved are viewed by the user as credible; and the substance of the assessment is salient for policy makers. To make an evaluation on these terms, the assessment under study must display "usability" for a particular user; the user in this case will be a nondescript policy making institution in the Northwest Territories.

Does the Arctic Human Development Report convey information about consequences?
An assessment conveys information about consequences if there is a clear, evidence-based statement about the potential costs of not engaging in a policy change to alleviate or minimize an identified problem. The assessment need not convey what policy change should be made, only that definitive consequences will result from no change.

Arctic Human Development Report

The Arctic Human Development Report was published in 2004 as a result of a cooperative effort between 90 researchers under direction from the Arctic Council and the United Nations Development Program (UNDP), with coordination provided by the Stefansson Arctic Institute in Iceland. A focus on human development has arisen in response to development models too closely dependent upon economic growth as the central explanatory factor. The work of Amartya Sen (1999) and other development theorists has sought to make economic growth only one facet of development measures. To this end, the AHDR is an assessment of social research in the Arctic covering subjects such as legal systems, community viability, education, and gender issues (for a complete list of subjects see Table 1).

The AHDR was mandated by the Arctic Council first as part of the Fifth Conference of Parliamentarians of the Arctic Region in 2002 and later in that same year as a specific policy priority noted in the Inari Declaration (2002). The AHDR was originally intended to serve as "a comprehensive knowledge base" on human development in the Arctic, although the final

Report goes further to emphasize policy relevance (Forbes, 2006; Young and Einarsson, 2004). The Inari Declaration explicitly recognized the importance of traditional knowledge in research and sought for it to be "fully used" in the Report (Inari Declaration, 2002, p. 2).

ANALYSIS

Does the Arctic Human Development Report constitute usable knowledge for policy makers in the Northwest Territories?

Usable knowledge is assessed by discussing the legitimacy, credibility, and saliency of the Report. The legitimacy of the AHDR hinges on the degree to which NWT policy makers trust the institution(s) responsible for producing the Report. It is reasonable to think that oversight by the UNDP would enhance the overall legitimacy of the AHDR; the United Nations is a multilateral international institution that generally enjoys popular and governmental support throughout Canada. UN leadership on issues such as climate change, biodiversity, and Aboriginal rights are broadly commensurate with policy positions across political institutions in the NWT. Moreover, the emphasis that UNDP places on broadening the concept of development is in keeping with perspectives on development held by NWT indigenous peoples (e.g., Irlbacher-Fox, 2009, p. 162). It is also reasonable to conclude that the Arctic Council is generally regarded by NWT policy makers as highly legitimate. Successive premiers of the Government of the Northwest Territories (GNWT) have regularly participated in Arctic Council meetings, as do permanent participants from the Arctic Athabaskan Council (including NWT Dene Nations), the Gwich'in Council International, and the Inuit Circumpolar Council. The legitimacy of the Arctic Council is surely that much higher in the NWT because its governance structure includes groups of indigenous peoples.

NWT policy makers would likely view the AHDR as legitimate. The AHDR Steering Committee included two members resident in the NWT, as well as others who reside in adjacent territories or those in the south active in the NWT policy process. These connections demonstrate that "the system has the interests of the user in mind" (McNie, 2007, p. 20). That said, it must be noted that the Steering Committee had far more Europeans than northern Canadians (by a ratio of about 4:1). Overall though, the AHDR could be characterized by reasonably high levels of trust between the Report's coordinating organizations and policy institutions in the NWT. The institutional legitimacy back-stopping the AHDR thus appears to be quite high.

The credibility of the AHDR is more difficult to assess. Credibility can be assessed by examining the quality and validity of the source(s) of information. It may be difficult for NWT policy makers to gauge the quality of information without the expertise or time necessary to test specific findings. NWT policy makers, like policy makers elsewhere, want research to meet high standards. Given the repeated emphasis on research done not only for — but *by* — northerners, the AHDR's credibility may hinge, in part, on the inclusion of northern authors and the use of traditional knowledge. The inclusion of researchers such as Karla Williamson (Nunavut), Chris Paci (NWT), and Stephanie Irlbacher-Fox (NWT) surely goes some distance towards reassuring NWT policy makers that research was drawn from studies that recognized indigenous knowledge. It is difficult to assess the degree of credibility that NWT policy makers hold for the AHDR, but there is no reason to conclude that the AHDR would not be deemed credible by NWT policy makers.

The third element in determining usable knowledge — saliency — is probably the most difficult to assess. Salience is the prominence or importance of information relative to a user's needs. It is difficult to summarize what sorts of information NWT policy makers may need at any point. In determining saliency, we are advised to consider "ecological, temporal, spatial, and administrative scales and timelines … regulatory and legal constraints" as well as " values and beliefs of stakeholders; the political landscape; and how information is communicated and presented, among other considerations" (McNie, 2007, p. 20).

The Report was coordinated from Iceland. There are not strong bonds of trade, political alliances, or tourist routes between Iceland and the NWT; moreover, the political capital of the NWT, Yellowknife, lies below the Arctic Circle and may exhibit stronger ties with cities such as Edmonton and Calgary, than with Akureyri and Reykjavik. That said, only a few months before the release of the AHDR, the then Chair of Senior Arctic Officials spoke in Yellowknife on the occasion of an open meeting of the Northern Research Forum (Palsson, 2004); the impending release of the AHDR was a major topic of discussion at the Forum. Attendees included the then Chief of the Yellowknife Dene; the federal Minister of State for Northern Development; the Mayor of Yellowknife; the territorial Minister of Education, Culture and Employment; and a representative from the Dogrib Treaty 11 Council (Final Program, Northern Research Forum, 14–15 September 2004). This constitutes a good cross-section of NWT policy makers who would surely have been aware of the AHDR.

To be salient, it is important that information about the NWT be re-flected, at least to some extent, in the Report. It would be parochial to as-sume that NWT policy makers would only find the Report salient if it was all about the NWT — comparative examples are surely welcome — but the scale and fit of information matters (Young, 2002; Cash and Moser, 2000).

Of the numerous case studies and examples in the AHDR, only two chapters make specific and sustained reference to NWT social systems. The chapter on education delineates authority for education in northern Canada, describes some trends and features of education in northern Athabaskan communities (including Tsiigehtchic), and sets out opportunities for post-secondary education (Johansson et al., 2004). The chapter on gender issues provides a focus on Canada, and offers data on female representation in the NWT territorial legislature, in municipal governments, and within NWT indigenous organizations; also included is a short discussion on the meaning of representation for indigenous peoples (Williamson et al., 2004). If the NWT is only reflected with any significance in two of eleven chapters, then it is perhaps fair to conclude that the AHDR may hold low salience for NWT policy makers.

To summarize, the AHDR would likely be perceived as legitimate and reasonably credible but appears, based on this evaluation, to hold little salience for NWT policy makers.

Does the Arctic Human Development Report convey information about consequences?

The researchers who produced the AHDR were determined to present "policy relevant conclusions" (Young and Einarsson, 2004a, p. 10). The AHDR has two chapters "designed to serve as a self-contained summary of the ADHR's main findings accessible to policy makers" (Young and Einarsson, 2004c, p. 229). These chapters should convey information about consequences.

The two-page *Summary of Major Findings* (AHDR, 2004, p. 10–11) presents the following "policy relevant conclusions":

- Arctic societies are resilient, but are facing unprecedented stresses

- Dominant policy issues in the Arctic are institutional in nature or relate to matters of governance[5]

Neither of these conclusions speaks to the consequences of a problem. The first point does a reasonably good job of identifying the extent of a problem by setting out the pace of change and the range of societal chan-

5.   I am paraphrasing; full concluding statements are shown in Appendix 1.

ges at play. Yet there is no information conveyed about how these changes might be consequential for Arctic societies. One is left to assume that change itself is somehow problematic. The second conclusion emphasizes the scale and fit (Young, 2002) of major policy issues, but again there is no information about whether the institutional or multilevel nature of these issues might be consequential for Arctic governments or societies. Overall, the two-page *Summary of Major Findings* devotes considerably more space to the identification of knowledge gaps and suggestions for future research, than it does to conveying policy relevant messages.

The aim of the final chapter of the AHDR, *A Human Development Agenda for the Arctic: Major Findings and Emerging Issues* (Young and Einarsson, 2004c, pp. 229–242), was intended "to draw attention to policy relevant findings rather than advocate the adoption of specific policies" (Young and Einarsson, 2004b, p. 22). Although it is understandable that the assessment authors would want to avoid being policy prescriptive, such a constraint should not inhibit researchers from conveying information about consequences. However, the final chapter is light on policy relevant information.

The final chapter covers eleven subject areas, mirroring the subject matter of the Report's chapters. Table 1 illustrates the primary message from each subject area (taken verbatim) and provides an assessment of whether information about consequences was conveyed. Only four of eleven subsections conveyed information about consequences: demography, economic systems, legal systems, and international relations.

By observing how some authors conveyed information about consequences, we can better understand how to structure research results in a way that is policy relevant and may help to improve health and quality of life in Aboriginal communities.[6]

The assessment of research on demography emphasizes the relatively small size of Arctic populations. The consequence is that small Arctic populations have weakened voices in national policy conversations. It is suggested that Arctic-specific policies may be needed to alleviate Arctic-specific concerns that are overlooked in national policy or program design. NWT policy makers, particularly in domains such as health policy, where national program funding is often based upon population size rather than program administration costs, would recognize the relevance of this Arctic-wide finding and draw strength from looking at how other Arctic jurisdictions deal with this problem.

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6.   I am grateful to the first anonymous reviewer for drawing my attention to this point.

Table 1. Primary Messages of the Arctic Human Development Report

Chapters	Primary Message	Consequence(s) Identified?
Demography	The human population of the Arctic is sparse, unevenly distributed, and skewed in terms of both age structure and gender balance.	Yes: small relative size of Arctic population means that Arctic issues often get overlooked in national debates and that Arctic-specific policies may be needed.
Societies and Cultures	Human societies in the circumpolar North are highly resilient; they have faced severe challenges before and adapted successfully to changing conditions.	No.
Economic Systems	Arctic economies are narrowly based and highly sensitive to outside forces, including market fluctuations and political interventions.	Yes: weak economic/political power and resource-dependent Arctic economies result in greater sensitivity to outside forces.
Political Systems	The devolution of political authority to regional and local governments in the Arctic has not been accompanied by significant reallocations of material resources.	No.
Legal Systems	There is a growing dualism between the legal rights of indigenous peoples and the authority of public governments in the Arctic.	Yes: growing strength of indigenous rights and the authorities of public government could result in conflict between these two political sectors.
Resource Governance	Many new and promising systems of resource governance have arisen in the Arctic, but little has been done so far to assess their performance using common criteria of evaluation.	No.
Human Health	Telemedicine has been highly successful in the Arctic, but effective responses to problems involving mental health, violence, and accidental death require the development or strengthening of community-based health services. Also, dietary concerns arising from changing lifestyles and responses to contamination have to be addressed.	No.
Education	Although education in the hands of missionaries, economic entrepreneurs, and colonial administrators has been a vehicle for assimilation, there are opportunities today to develop education systems well-suited to the needs of Arctic residents.	No.
Community Viability	Maintaining the viability of Arctic communities requires an enhanced ability to take advantage of interactions among governmental, corporate, organizational, and personal networks from the local level to the global level.	No.
Gender Issues	Recent developments in the Arctic have generated new concerns about gender roles, without alleviating pre-existing problems.	No.
International Relations	The impacts of both global environmental change and global social change threaten to overwhelm efforts to carry out regional initiatives and to forge a strong sense of regional identity in the Arctic.	Yes: changes at various levels, and of different types, may cause corresponding consequences for relations at various levels of interaction.

The assessment of research on economic systems found that the resource dependent nature of Arctic economies combined with relatively weak economic/political power in national and international arenas, leaves Arctic societies vulnerable to exogenous shocks. These shocks can result from unexpected jolts (e.g., commodity market fluctuations) or policy changes (e.g., new regulatory requirements). Either way, change can be imposed from the outside. And less economic/political power decreases the ability to control against such shocks. This finding may be relevant to NWT policy makers considering economic investment options, secondary processing capabilities, or enhanced controls over economic policy levers (e.g., regulation).

The assessment of research into legal systems found a "growing dualism" (Young and Einarsson, 2004c, p. 232) between the legal rights of people (particularly indigenous peoples) and the power of public governments. This dualism could result in a possible "collision course" (Young and Einarsson, 2004c, p. 232) between people and their governments. This finding is pertinent in an NWT political landscape where the settlement of Aboriginal land claims and the establishment of Aboriginal self-government are happening in tandem with the devolution of powers from the Government of Canada to the GNWT.

The assessment of research into international relations in the Arctic also conveyed information about consequences. The assessment concludes that the pace of social and environmental changes in the Arctic could "threaten to overwhelm efforts to carry out regional initiatives and to forge a strong sense of regional identity" (Young and Einarsson, 2004c, p. 235). This consequence arises in part from a policy paradox: increased issue attention is beneficial for agenda setting, but may result in more regional influence being exerted by national governments. Decisions by policy makers in southern capitals such as Washington, Ottawa, or Copenhagen may be based on different perspectives and/or objectives than those held by policy makers in Anchorage, Yellowknife, or Nuuk. This consequence is surely salient for NWT policy makers who sometimes attempt to align their positions with national policy priorities (e.g., sovereignty), but recognize that in doing so there is a risk of losing power and autonomy.

Overall, the AHDR displays a minimal level of salience for policy makers in the NWT, especially when judged by the volume of information about consequences conveyed. The opening *Summary of Major Findings* purports to express policy relevant conclusions, but only weakly conveys the extent of social problems in the Arctic and says nothing about the consequences of

these problems. Only four of eleven subject areas summarized in the final chapter identify potential consequences for human development in the Arctic. An opportunity has been lost by not speaking more directly about the consequences of problems found in other social realms. For example, it would have been appropriate in the chapter on gender issues to emphasize some of the specific costs that result from inequity between men and women. Some consequences are alluded to, such as health risks that arise from changes in the societal role of men and corresponding lower levels of self-esteem, but these messages are buried beneath the blasé conclusion that "recent developments have raised new concerns" (Young and Einarsson, 2004c, p. 235). If information about consequences serves as a useful proxy to measure the policy relevance of a comprehensive scientific assessment, then the AHDR is relevant in some policy areas (i.e., demographic, economic, legal, international relations) but overall is more relevant for those designing Arctic research projects than those making regional policy.

Meaning

"The path from truth to power is a circuitous route at best" advises Haas (2004, p. 571). The broader literature on policy change speaks of "issue attention cycles" and "punctuated equilibrium" (Cashore and Howlett, 2007; Birkland, 1997; Baumgartner and Jones, 1993; Kingdon, 1984; Downs, 1957), all of which are uncertain and uncontrollable. Are we prepared to accept that research has no greater influence upon the policy process than haphazardly shaping long-term social learning? This "depressing conclusion" about research-policy relationships (drawn by, among others, Eijndhoven et al., 2001, pp. 181–198; Zahariadis, 2003; Bocking, 2004; Kingdon, 1984) leaves policy makers simply hoping that research might be relevant. Citizens asking their elected officials to make policy decisions that will help to improve health conditions and overall quality of life, expect more than hope.

Findings from the political science literature examining research-policy relationships, demonstrates that research can be relevant to policy making in a more meaningful way. There are necessary but not sufficient conditions under which research has a greater likelihood of being relevant to policy making. Primary among those findings, and accepted across rationalist and constructivist perspectives, is that when research is conveyed through comprehensive scientific assessments, rather than through individual studies, research is better able to influence policy making (National Academies, 2007; Dimitrov, 2006; Mitchell et al., 2006a; Farrell and Jäger, 2006a; Jasanoff and

Martello, 2004a; Parson, 2003). Also, when certain types of information are shared among policy makers, and shared in particular ways, research becomes a more forceful influence in policy making. Comprehensive assessments of research must be authoritative documents: the institution that produces the assessment must be legitimate from the perspective of the user; the research drawn upon and the researchers involved must be viewed by the user as credible; and, the information conveyed must be salient. Perhaps the most crucial method for determining the salience of a comprehensive assessment is to ask whether or not the assessment adequately conveys information about the consequences of a problem. If it does not, then the assessment may have some policy relevance but it is less likely to be influential.

Policy makers need not abandon expectations for policy relevant research. Expectations simply need to be recalibrated. Policy makers should pay attention to promoting and participating in comprehensive scientific assessments, and ensuring that assessments are structured to maximize policy relevance.

Policy makers can insist that someone who understands their interests is involved in the production of the assessment. This does not mean that each political organization must produce its own comprehensive assessment or even that each political organization needs its own representative on a steering committee. Producing a comprehensive assessment is not an exercise in representation. The AHDR can reasonably be deemed as legitimate for NWT policy makers because of the cross-section of relationships and corresponding levels of trust embodied in the Arctic Council, the United Nations, and those who served on the AHDR Steering Committee.

Policy makers should insist that research be credible. This does not necessitate a political organization carefully reviewing the bibliography of each chapter of an assessment. The AHDR can be deemed to be reasonably credible for NWT policy makers because it was established early and prominently in the assessment process that traditional knowledge would be recognized and respected, and that northern authors familiar with research concerning the NWT would be part of the assessment team. Where the AHDR loses some credibility is its inability to sufficiently reflect information about the NWT back to NWT policy makers. At several places in the AHDR it is difficult for NWT policy makers to see themselves.

Policy makers should expect an assessment that is salient. One method of assuring salience is to insist that the assessment convey information about the consequences of a problem. It is not enough to speak of the caus-

es and extent of a problem. Researchers can summarize potential consequences without being prescriptive about how a problem should be solved. The AHDR clearly sought to be policy relevant, but its creators undertook to do so without understanding what type of information is policy relevant. The authors who wrote about demography, economic systems, legal systems, and international relations understood that information about consequences matters. The AHDR failed in its ultimate attempt to be policy relevant because it largely ignored information about consequences.

Low policy capacity is an issue in the NWT (Howlett, 2009). This is a particularly acute problem for nascent Aboriginal governments and organizations. One way to circumvent low policy capacity is to turn to existing research to help guide policy making. It is prudent to caution against small governments and policy making organizations investing in extensive in-house research capabilities. Some investment in research is surely warranted and valuable, but not to the point of diminishing returns. There is already a strong network of researchers with a deep interest in Arctic inquiry. The overwhelming southern basis for this research is lamentable, but it is unlikely to change anytime soon. Research about the north undertaken by a person resident in the south does not mean that the research is not relevant to northern concerns. Although a policy maker may not be able to directly attribute a linkage between a single study and a contemporary policy issue, this does not diminish the potential policy relevance of research. The policy relevance of research comes not from single studies, but from a body of inquiry produced over time and conveyed in a comprehensive assessment of knowledge. Policy makers would be well advised to focus their efforts "on building a broad culture of respect for basic science and knowledge" (Ramakrishan, 2009), ensuring that comprehensive scientific assessments are produced and assessments convey usable knowledge that incorporates information about consequences.

Appendix 1

"Policy Relevant Conclusions," Summary of Major Findings, Arctic Human Development Report (2004)

Arctic societies have a well-deserved reputation for resilience in the face of change. But today they are facing an unprecedented combination of rapid and stressful changes involving environmental processes (e.g., the impacts of climate change), cultural developments (e.g., the erosion of indigenous languages), economic changes (e.g., the emergence of narrowly based mixed economies), industrial developments (e.g., the growing role of multinational corporations engaged in the extraction of natural resources), and political changes (e.g., the devolution of political authority).

The issues that dominate the Arctic agenda today typically involve institutional issues or matters of governance. These concerns arise at the local level (e.g., creating comanagement regimes), the regional level (e.g., resolving frictions between public governments and indigenous peoples organizations, finding ways for county, state, and territorial governments to generate needed revenues), and the circumpolar level (e.g., sorting out relations between the Arctic Council and the Northern Forum).

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