"Indigenous Ways of Knowing" and the Environment: Does Epistemological Relativism Contribute to the Protection of Western Lands?

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An increasingly common argument, in the environmental policy literature, is that the incorporation of "indigenous ways of knowing" is necessary to understanding environmental impacts, contributing to the capacity of policymakers to address the environmental crisis. Two claims are made in support of this. The first is that aboriginal people are "keen observers" of the environment, and this will aid scientific research. The second is that native groups did not destroy the environment before contact and this is an indication of an aboriginal environmental consciousness that helps to shape their knowledge. Aboriginal peoples, it is argued, have a "way of knowing" that mandated them to "live lightly on the land", in contrast to the "western" viewpoint of Europeans that prizes the control over nature and the exploitation of resources to spur industrial progress.

Using three case studies in western Canada – global warming research, the development of endangered species legislation, and aboriginal involvement in Alberta tar sands development – these claims will be investigated. This will first require a definition of "indigenous ways of knowing" and an understanding of how it differs from knowledge that is non-indigenous. Questions will then be raised as to how knowledge diversity can facilitate the development of a common understanding that is necessary to facilitate effective policymaking. Successful policy development, after all, requires that problems be clearly defined, causal factors identified and the severity of issues accurately measured – requirements that cannot be easily reconciled with postmodern assertions about different, but equally valid, "world views". Finally, the paper will examine whether or not these assertions about "indigenous ways of knowing" are a response to the inadequacies of scientific theories and methods, or are a reflection of the economic and political context in which scientific research operates.

What are "Indigenous Ways of Knowing"?

In the Under Western Skies conference's call for papers, "indigenous ways of knowing" was one of the "possible directions" that academics and other stakeholders could pursue in examining the environmental challenges facing western lands. This assertion raises questions about the character of "indigenous ways of knowing" and how they differ from "ways of knowing" that are non-indigenous (i.e. universal knowledge shared by other cultures). It also seems to be drawing a correlation between "indigenous ways of knowing" and understanding environmental problems in western North America – an assumed relationship that should be subjected to scrutiny.

"Indigenous ways of knowing" (also referred to as "traditional knowledge" or "indigenous knowledges") are maintained to be different forms of "knowledge", supposedly held by aboriginal people, that provide "more and sometimes better information" about the environment that is of "greater breadth and depth" than existing scientific data.[1] It is asserted that these "knowledge systems" can be used to improve resource management processes[2] and "offer valuable insights and teachings" in a number of areas, including environmental studies.[3]

But how do "Indigenous ways of knowing" differ from the scientific intellectual "tradition"? This is a difficult question to answer since there is no consensus on what knowledge is actually "held" or how it relates to science. Some commentators say that they are a "kind of science,"[4] while others maintain that they are fundamentally different from science or even "superior" to it.[5] These uncertainties mean that any study begins by weighing the merits of various definitions,[6] and the result is either tautological – aboriginal peoples' knowledge is a "way of knowing," "different knowledge system," "system of understanding," and so forth - or acts to include elements that are *distinct from* knowledge, such as values, beliefs and practices.[7]

As has been noted elsewhere,[8] "Indigenous ways of knowing" consist of beliefs, practices and observations, and only the latter can be considered "knowledge" (i.e an accurate understanding of the natural world). Beliefs and practices are not a "way of knowing", even if they result in

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[1] Stephen C. Ellis, "Meaningful Consideration? A Review of Traditional Knowledge in Environmental Decision Making," *Arctic* 58:1 (2005), 66-77; Henry P. Huntington, "Using Traditional Ecological Knowledge in Science: Methods and Applications," *Ecological Adaptations* 10:5 (October 2005), 1270-4; Brenda Parlee et al. "Using Traditional Knowledge to Adapt to Ecological Change: Denesoline Monitoring of Caribou Movements," *Arctic* 58: 1 (2005), 26; Royal Commission on Aboriginal Peoples [*RCAP], Report of the Royal Commission on Aboriginal Peoples [Final Report]*. Ottawa: Supply and Services, 1996, 1, 640.

[2] Paul Sillitoe, "The Development of Indigenous Knowledge: A New Applied Anthropology," *Current Anthropology* 39: 2 (1998), 226; Fikret Berkes et al., "Introduction," in Fikret Berkes et al., *Navigating Social Ecological Systems.* Cambridge: Cambridge University Press, 2003; and O'B. Lyver and Lutsel K'e Dene First Nation, "Monitoring Barren-Ground Caribou Body Condition with Denesoline Traditional Knowledge," *Arctic* 58: 1 (2004), 44-5.

[3] RCAP, *Final Report,* 4, 128.

[4] Gregory Cajete, *Native Science: Natural Laws of Independence.* Santa Fe, New Mexico: Clear Light Publishers, 2000.

[5] Winona LaDuke, "Social Justice, Racism and the Environmental Movement," September 28, 1993, www.zmag.org/zmag/articles/barladuke.htm (accessed November 2006) and Deborah McGregor, "Traditional Ecological Knowledge," *Atlantis* 29:2 (2005), 2-3.

[6] Alan Reid et al., "Traditional ecological knowledge for learning with sustainability in mind," *The Trumpeter* 18:1 (2002), 2-8.

[7] Fikret Berkes et al., "Rediscovery of Traditional Ecological Knowledge as Adaptive Management," *Ecological Adaptations* 10:5 (2000), 1252 and Ellis, "Meaningful Consideration?" 72.

[8] See Frances Widdowson and Albert Howard, *Disrobing the Aboriginal Industry: The Deception Behind Indigenous Cultural Preservation* (Montreal: McGill-Queen's University Press, 2008), pp. 233-248.

environmental sustainability. It is a question of the evidence that exists to support a contention, not if the result of an action or a belief is ecologically beneficial.

So, how do the observations of aboriginal people, which can contribute to our understanding of the natural world, differ from the empirical findings that form the basis of scientific research? The observations of aboriginal people, like all forms of "local knowledge", are claimed to be unique since they have been accumulated in an area for the purposes of survival over generations, instead of the intermittent periods of time used in scientific studies.[9] It is pointed out that scientists collect data during a sporadic field trips,[10] unlike aboriginal peoples, who have been "intimately connected" with their environment for "thousands of years." It is for this reason that Peter Usher claims that traditional knowledge can "contribute to environmental assessment by providing a broader and deeper understanding of baseline conditions and a fuller understanding of local environmental processes, at a finer and more detailed geographical scale, than conventional scientific knowledge can offer."[11]

Local knowledge observations, however, are not systematically measured and recorded, which makes them very different from scientific findings. The scientific method is a significant improvement over previous forms of observation and experience because the latter's reliance on subjective interpretation allows for the potential misunderstanding of natural processes. Only when specific measurements and controlled experiments are undertaken can local knowledge observations be shown to be mistaken.[12] Therefore, Usher's apparent inference that scientific data are less accurate than traditional knowledge's observations is incorrect. It is by taking a "snapshot" of animals, vegetation, water and soil at regular intervals that scientists are able systematize the collection of data. Although Usher claims that the "memory of several generations" can be "preserved" to offer "a broader and deeper understanding of baseline conditions [than scientific records]", this view ignores that there are numerous variances with a group's collective memory when it is not recorded.[13]

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[9] Fikret Berkes and Thomas Henley. "The Usefulness of Traditional Knowledge: Myth or Reality?," *Policy Options* (May 1997).

[10] John Sallenave, "Giving Traditional Knowledge it Rightful Place in Environmental Impact Assessment," *Northern Perspectives*, 22:1 (Spring 1994).

[11] Peter J. Usher, "Traditional Knowledge in Environmental Assessment and Management," *Arctic* 53:2 (2000), p. 187.

[12] Usher, p. 14.

[13] The anthropologist Alexander von Gernet has noted that because the collective memory of an aboriginal group cannot be "pinned down", it can change dramatically over the years. This is especially relevant when one considers that oral traditions have been passed down through a number of generations; the longer the passage of time between an event and a recollection, the more likely the memory will be distorted by other events. While recorded observations can be incorrect or biased, their original formulation "becomes permanent as it is archived and 'subtracted from time'". This is different from memories, where "a primary or 'original' version (if such existed to begin with) is lost to modern scrutiny since it is replaced by later versions. What is left may be multiple layers of interpretations which have accumulated over time and a content that may only vaguely resemble an 'original' oration". Alexander von Gernet, *Oral Narratives and Aboriginal Pasts* (Ottawa: Department of Indian and Northern Affairs, 1996), p. 11.

As a result, local knowledge holders put forward observations of an "individual nature" and "[focus] on particulars rather than generalizations". It is also noted that these "local-level observations…may not always translate well into discussions of wildlife populations on the larger geographic scale".[14] They also have a "lower precision" than the data compiled in scientific research.[15] Ecological baseline studies using local knowledge refer to particular species' abundance as "high", "medium" or "low",[16] and whether or not animals are "skinny" or "fat".[17] These data would be less useful for monitoring ecosystems in environmental policy than current scientific research because of the inconsistency of subjective terminology. Like other local knowledge studies that elicit impressions during meetings, workshops, and "semi-directed interviews" from a variety of aboriginal people (usually elders), the methods used are not quantified and explained to ensure that they are being used consistently.[18] This is very different from scientific research, which ensures that the data collected can be directly compared with other studies, and the methods used publicly evaluated.

The imprecise and inconsistent character of the data acquired from local knowledge observations, however, is disguised by the second component of "indigenous ways of knowing" – the beliefs, values and practices of aboriginal people. While not a form of knowledge, these elements are assumed to contribute to an aboriginal person's understanding of the environment. It is asserted that aboriginal people lived in harmony with the flora and fauna for "thousands of years", and that the "spiritual teachings" of aboriginal elders enabled this "balance with nature" to be maintained. Unlike Europeans who were raised in the "Judeo-Christian" tradition and encouraged to exploit nature for their own ends, it is argued that the native population's spiritual beliefs taught them to "respect" non-human elements, preventing them from destroying the earth.[19] It is asserted that attempts to "fulfil the role of steward assigned to them by the Creator" led aboriginal peoples to develop customs, rules, laws and even institutions that ensured environmental sustainability.[20] Winona LaDuke also maintains that the "cyclical" thinking in

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[14] Martha Dowsley and George Wenzel, "'The Time of the Most Polar Bears': A Co-Management Conflict in Nunavut", *Arctic*, 61(2), June 2008, pp. 182-3.

[15] Dowsley and Wenzel, p. 182.

[16] MacDonald Environmental Sciences Ltd., *Acquisition of Traditional Environmental Knowledge in the Lower Liard River Basin*. Ottawa: Indian and Northern Affairs Canada, 1995.

[17] O'B. Lyver and Lutsel K'e Dene First Nation, "Monitoring Barren-Ground Caribou …," 46-52. Dowsley and Wenzel, p. 182.

[18] Many traditional knowledge studies, in fact, note that they have obtained contradictory data, which is difficult to summarize.

[19] Fred Plain, "A Treatise on the Rights of Aboriginal Peoples of the Continent of North America," in Menno Boldt and J. Anthony Long (eds), *The Quest For Justice*. Toronto: University of Toronto Press, 1985, p. 34; Winona LaDuke, "Social Justice, Racism and the Environmental Movement," 28 September 1993, www.zmag.org/zmag/articles/barladuke.htm (accessed November 2006); and Jace Weaver (ed), *Defending Mother Earth: Native American Perspectives on Environmental Justice*. New York: Orbis Books, 1996.

[20] Royal Commission on Aboriginal Peoples [RCAP], *Report of the Royal Commission on Aboriginal Peoples [Final Report]*, 2:2, Chapter 4, Section 3.2; E.E. Sherry and H.M. Myers, "Traditional Knowledge in Practice," *Society and Natural Resources* 15:4 (2002), p. 354; Sherrie Blakney, "Aboriginal Forestry in New Brunswick,"

aboriginal spirituality – i.e. that spiritual forces will hold them to account in the future for any transgressions made against nature today – impart an ecological consciousness.[21]

An examination of *how* aboriginal people happened to develop an environmental sensitivity, while Europeans did not, however, is usually avoided because the assertions are racist. The assumption is that aboriginal people, because their ancestors developed a special "covenant" with God when He gave them North America, will "naturally" look after the environment. Since aboriginal people did not destroy the environment, while "whites" did, it *must* be the former's ancestrally (racially) determined philosophy that ensured environmental sustainability. It is not considered that the primitive technology and subsistence economies that existed in the Americas before contact would have precluded a significant impact on the environment.

In order to sustain the argument that it was aboriginal peoples' philosophy that was the determining factor in their "harmonious" relationship with the environment, it would be necessary to show that they had the capacity to destroy the environment, but consciously constrained themselves from doing so. It also would have to be shown that aboriginal peoples retained their beliefs and environmentally sensitive practices even when more destructive technologies and a profit-oriented economic system were introduced. Otherwise, aboriginal peoples, like all human beings who have lived on the planet, were only responding to economic and political imperatives. Once more sophisticated technology is developed and the profit motive becomes dominant, people must either participate in the system or change it; they cannot simply "choose" to ignore it and operate according to some kind of transcendental environmental ethic. To do so would result in being "squeezed out" in the global competition for resources and markets.[22] The idea that environmentalism is inherent within the aboriginal population, however, has been created by transposing concerns, caused by industrialization, onto a romanticized image of aboriginal peoples.

This romanticism has prevented a critical look at the dubious value of local knowledge being put forward to help us understand the challenges facing western lands. At best, these observations add little to our understanding of environmental processes, while at worst they obscure aboriginal economic interests and act to greenwash environmentally destructive activities. Attempts to inflate the importance of local knowledge also result in a criticism of science, rather than focusing on the economic and political interests that distort research. The current environmental crisis has been interpreted as a "loss of spirituality" rather than the outcome of an unsustainable economic system.

Environments 31:1 (2003); Ian Keay and Cherie Metcalf, "Aboriginal Rights, Customary Law and the Economics of Renewable Resource Exploitation," *Canadian Public Policy* 30:1 (March 2004), pp. 3-5.

[21] LaDuke, "Social Justice, Racism, and the Environmental Movement."

[22] Such was the circumstance in the development of the fur trade, which resulted in many wildlife species being depleted. This was due to the fact that different aboriginal tribes used guns they acquired to maintain or increase their economic position in the global trade of furs.

Muddying the Science of Global Warming

One of the most significant challenges facing people in western North America, as well as the entire planet, is the problem of global warming. Because of increasing carbon dioxide emissions due to industrial development, the temperature of the planet has risen by 0.6 degrees Celsius over the past 100 years, and if emissions are not curbed, the global temperature is expected to warm more rapidly in the future.[23] This concern led to a target being set in Copenhagen to prevent "the Earth's average temperature from rising more than 2 degrees Celsius (3.6 degrees Fahrenheit) above the levels that existed before nations began industrializing in the late 18th century".[24]

Although it is now generally accepted that global warming is being caused by human activities (largely through the burning of fossil fuels), debates about the existence of the problem have been occurring since the 1960s. It was not until this decade, however, that a scientific consensus started to emerge that the problem was a man-made one, and not just a natural fluctuation. This consensus was made possible by a great deal of research – investigations that continue today. The consensus also emerged with the realization that a number of economic interests – mostly those associated with the oil and gas industry – were trying to prevent people from understanding the human causes of global warming.[25]

Research is regarded as being particularly important to the issue of global warming because it will enable policymakers to understand the extent of the problem and the impacts that will be generated. Understanding these impacts, it is argued, will enable governments to better prepare for the environmental consequences. Increased intensity of forest fires, insect infestations, and water shortages and/or flooding are just a few of the probable outcomes, and understanding their character and severity is very important for future policy development. With respect to western Canada, for example, it has been noted that a number of at risk species, including the Whitebark Pine and Flammulated Owl, are likely to become even more stressed with the environmental changes brought about by global warming.[26]

"Emergency management" and "risk assessment" are often used in the context of examining global warming, and more accurate scientific data are perceived as aiding these policy tools.[27] Scientific uncertainty, on the other hand, has created difficulties for policymakers since it has been manipulated by various economic interests to discourage governments from addressing the

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[23] Terry L. Root et al., "Fingerprints of global warming on wild animals and plants", *Nature*, 421, January 2003, pp. 57-60.

[24] Jim Gomez, "UN chief urges environmental officials to reject skeptics, says climate change danger is real", *The Canadian Press*, February 24, 2010.

[25] Charles Montgomery, "Nurturing doubt about climate change is big business", *The Globe and Mail,* August 12, 2006..

[26] http://www.cosewic.gc.ca (accessed October 2010)

[27] George Haddow et al., *Global Warming, natural hazards, and emergency management* (Boca Raton: CRC Press, 2009).

problem of global warming.[28] The Bush administration in the United States, for example, had close ties to the oil and gas industry and worked to suppress scientific research that was documenting the problem. As a result, government action on climate change was delayed for a decade.

To improve the quality of information received about global warming, it has been recommended that "indigenous ways of knowing" be incorporated into scientific research. Over ten years ago, for example, NASA sponsored a five-day "Circle of Wisdom: Native Peoples/Native Homelands Climate Change Workshop". This workshop involved several hundred aboriginal elders so as to understand "the effect of climate change on the U.S. population, environment and economy". At the end of the workshop, the elders attending issued "The Albuquerque Declaration" affirming that "a growing body of Western scientific evidence now suggests what indigenous peoples have expressed for a long time: life as we know it is in danger. We can no longer afford to ignore the consequences of this evidence".[29] A similar declaration was made in 2009 at the "Indigenous Peoples Global Summit on Climate Change" in Alaska, where it was maintained that

> through [indigenous peoples'] knowledge, spirituality, sciences, practices, experiences and relationships with our traditional lands, territories, waters, air, forests, oceans, sea ice, other natural resources and all life, Indigenous Peoples have a vital role in defending and healing Mother Earth. The future of Indigenous Peoples lies in the wisdom of our elders, the restoration of the sacred position of women, the youth of today and in the generations of tomorrow.[30]

But what was the wisdom that enabled indigenous peoples to understand the threat to "life as we know it" posed by global warming, and how will indigenous knowledge play "a vital role in defending and healing Mother Earth"? An examination of the account of the workshop sponsored by NASA shows that this threat largely had been revealed by aboriginal prophecies and other spiritual beliefs.[31] These beliefs do not constitute knowledge, and cannot, in any way, be used to improve the quality of scientific research.

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[28] James Hoggan, *Climate Cover-up: the crusade to deny global warming* (Vancouver: Greystone Books, 2009).

[29] Al Gedicks, *Resource Rebels: Native Challenges to Mining and Oil Companies* (Cambridge: South End Press, 2001), p. 5.

[30] http://www.indigenoussummit.com (accessed October 2010).

[31] These prophecies evidently had predicted "a time when the people would be confused, and the old and the young would die first" and "the trees would die from the tops down and the world would be in danger". Other spiritual beliefs pointed to a lack of "spiritual connection to Mother Earth, Father Sky and all Creation" that was causing the problem. It was noted that "Native people traditionally have understood that the Earth and universe have a mind and spirit, a cosmic intelligence that responds to us, to our intentions", and therefore the Cheyenne elder Henrietta Mann recommended that ceremonies should be undertaken to "honor [Mother Earth's] life-giving power so that she can continue to nourish us". Corbin Harney, a Shoshone elder, recommended prayers to combat global warming. According to Harney, "[the spirits of the land and the ancestors] want to hear us pray so that they can work with us, so everything can heal". "NASA Listening to Native Elders to Help Save Environment", *Salt Lake Tribune*, January 1, 1999.

While it would be irresponsible and condescending for governments to give credence to these "indigenous ways of knowing", some observations were mentioned at the NASA workshop that could potentially assist rational policy development with respect to global warming. It was noted, for example, that the elders had observed that the sea ice was forming later, and this was negatively impacting animals requiring sea ice to reproduce. Aboriginal hunters also had observed that walrus were "skinny" and that caribou migration patterns had changed.

These observations are similar to those identified in other studies attempting to use traditional knowledge in understanding the environmental impact of climate change. One study interviewing aboriginal people "considered to be local experts on sea ice"[32] found that their observations were "remarkably consistent in providing evidence of local change in such variables as multiyear ice distribution, first-year ice thickness, and ice breakup dates." Another study argued that Inuit were "keen observers of the weather" and could make "accurate reports" about "wind speed and direction, cloud formations and animal behaviour", alerting scientists to "the increased variability and unpredictability of weather" (something that, it was claimed, "had not been fully addressed in the scientific literature"). Finally, a documentary recording interviews of Inuit elders has noted that they have come to the conclusion that "climate change is caused by the earth having tilted on its axis" – a hypothesis that could inform global warming research.[33]

But hasn't "the increased variability and unpredictability of weather" been known for decades? This, in fact, is not a neglected area of research. The second chapter of the Science Report of the *Third Assessment Report of the Intergovernmental Panel on Climate Change*, for example, is entitled "Observed climate variability and change". This chapter examines the extensive body of research that has been compiled on this subject.[34]

Furthermore, aboriginal observations about "multiyear ice distribution, first-year ice thickness, and ice breakup rates are so vague that they could not be useful in a scientific study. Quotations from elders such as "[Ice] goes out quicker now...It is different", "Freeze-up is way later. Less [multiyear ice] doesn't make the water as cold," and "[The weather nowadays is] sometimes cold, but sometimes hot too...[but at the] wrong time. Way different now" are provided to support the assertion that traditional knowledge can be used to "provide a baseline against which to measure change," when far more detailed and systematic scientific data already exists. This information has been compiled from a variety of written records – research from the Canadian Wildlife Service,[35] records of the dates barges can access northern communities each year, thirty years of

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[32]Theresa Nichols et al., "Climate Change and Sea Ice: Local Observations from the Canadian Western Arctic," *Arctic* March, 57:1 (2004), pp. 68-80.

[33] SSHRC, "Altered perspectives: Inuit knowledge provides scientific insight into climate change", *Dialogue*, Winter 2010, http://www.sshrc-crsh.gc.ca/newsletter-bulletin/winter-hiver/2010/mauro-eng.aspx (accessed October 2010).

[34] http://www.ipcc.ch/pub/tar/wg1/index.htm (accessed October 2010).

[35] I. Stirling et al., "Polar bear distribution and abundance on the southwestern Hudson Bay coast during open water season, in relation to population trends and annual ice patterns", *Arctic*, 57(1).

documented ice draft measurements from submarine expeditions, and data from satellites. These data are more accurate because they have used universally understood measurements that can be easily compared with new data that is collected.

The most interesting example of traditional knowledge discussed with respect to global warming concerns the view that "climate change is caused by the earth having tilted on its axis". This "knowledge" turns out to be an incorrect interpretation of an observation. It is not that the earth has tilted, but an optical shift due to "a complex interplay between the wind, atmosphere, earth and ice". This observation was not "proof of a warming world", as is claimed;[36] although it is linked to global warming, this is only known because of accurately and consistently measured temperature data (compiled in scientific studies).

It is obvious from the various studies examining the role played by "indigenous ways of knowing" in climate change research that the interest is not due to the quality of the data or the spiritually-inspired platitudes. The interest is driven by the belief that there *must* be some important insights to glean, since aboriginal people did not destroy the environment before contact. The fact that the dramatic warming that we are experiencing today did not occur before contact is used to legitimize ideas about transcendental aboriginal "wisdom".

Even those who might be skeptical about the extent to which the traditional observations of aboriginal elders could help to understand a complex, industrially created, problem like global warming would be reluctant to question the usefulness of traditional knowledge in scientific research. This is because recognizing traditional knowledge is seen as a charitable way to "recognize" and "respect" aboriginal culture. What is the harm, it is often asked, in helping aboriginal people to feel good about their culture and traditions? Aboriginal people have been subjected to all sorts of oppression over the years and stating that "indigenous ways of knowing" are important is a pretention of including aboriginal people in policymaking.

But there are two fundamental problems with such a contention. The first is that assertions about "indigenous ways of knowing" are condescending to aboriginal peoples. Aboriginal people deserve to be included in debates that impact all of us. To not question ideas that confront reason is to patronize their holders, depriving them of insights that may have been overlooked. All participants benefit from the free exchange of ideas, and to demand that one should mislead others out of "respect" is itself disrespectful. Rational people readily change their minds when it is warranted by evidence, and honest discussion about the value of traditional knowledge would encourage this. It would also include aboriginal people in the development of scientific thought – a discipline denied them by the encouragement of "indigenous ways of knowing".

An even more disturbing problem is that the acceptance of different "ways of knowing" obscures the interests that can hide behind the assertions of traditional knowledge holders. With respect to endangered species protection policy, for example, aboriginal peoples are often wildlife harvesters, and therefore are reluctant to have the species that they hunt and fish declared at risk. And while aboriginal people are not directly involved in the extraction of oil from the tar sands,

[36] SSHRC, "Altered perspectives".

the idea that aboriginal peoples are "custodians" of the planet enables corporations to use traditional knowledge to greenwash their activities. A number of oil companies have funded traditional knowledge studies, and these are used to give credibility that the tar sands are environmentally sustainable.

Conflicts Over Species at Risk

In the addition to climate change, a serious environmental challenge facing western lands in North America is the increasing number of endangered species in the world. This problem has been the subject of much scientific research, which prompted the Government of Canada to develop the *Species at Risk Act.* This Act, passed in 2002, was designed "to create a legislative base for the scientific body that assesses the status of species at risk in Canada".[37] The legislative base includes the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), which was created in 1977 because of "the need for a single, official, scientifically sound, national classification of wildlife species at risk". Under the Species at Risk Act, the federal government must consider COSEWIC's designations when establishing the legal list of endangered species.[38]

The information used by COSEWIC in determining the assessment of endangered species changed in 2000, when the Aboriginal Traditional Knowledge (ATK) Subcommittee was added. This subcommittee was formed "to assist …in the acquisition and incorporation of Aboriginal Traditional Knowledge into the COSEWIC status assessment process". This subcommittee was not the only body created by the federal government to integrate "indigenous ways of knowing" into the assessment of wildlife species. A National Aboriginal Council on Species at Risk was also established under the Species at Risk Act to "advise the federal Minister of the Environment on the administration of the Act and provide advice and recommendations to the Canadian Endangered Species Conservation Council". This organization's Mission Statement consists of a quotation from Paul Skanks, a Haudenosaunee Spiritual Advisor, which refers to a duty "to protect and preserve the Sacred Circle of Life, by applying Aboriginal knowledge and values" so as to "honour our covenant with the Creator and the Earth, the mother of all species…".

But the reference to a "covenant with the Creator" feeds into dangerous mythology that negatively impacts our capacity to meet the environmental challenges facing western lands. It encourages people to interpret all aboriginal claims as efforts to protect wildlife species, when it is the interests behind these claims, as well as the quality of the information on which they are based, that should be examined. The National Aboriginal Council on Species at Risk, for example, refers to its role in ensuring that "Aboriginal interests [are] reflected in the *Species at Risk Act",*[39] raising questions about how aboriginal and non-aboriginal interests could differ from one another. This draws attention to the fact that some aboriginal demands often are in

[37] Kirsten Douglas, *Legislative Summary – Bill C-5: The Species at Risk Act* (Ottawa: Parliamentary Research Branch, 2002), p. 1.

[38] http://www.cosewic.gc.ca/eng/sct6/sct6_3_e.cfm#hist (accessed October 2010)

[39] http://www.nacosar-canep.ca (accessed October 2010).

opposition to wildlife conservation because many aboriginal peoples are harvesters of wildlife. Therefore, "Aboriginal interests" often constitute attempts to prevent species from being protected so that they can continue to be hunted or fished.

With respect to western lands, this conflict of interest can be seen in the case of aboriginal groups in the Pacific Northwest that are aligning themselves with Norwegian and Japanese corporate interests in an attempt to restore commercial whaling. These aboriginal groups have gained exemptions from regulations banning whale hunting on the basis that it is a "traditional" or "sacred" activity,[40] but there are indications that demands to make a moderate living through commercial whaling will be the next step.[41] As has been the case of the granting of an aboriginal right to fish commercially, a legal argument made with respect to fishing could be extended to the commercial sale of whale meat on the basis that this activity is needed to ensure aboriginal cultural survival.[42]

A similar conflict between aboriginal rights and sustainability has occurred in the case of the bowhead whale, which is now being hunted by aboriginal people in the Western and Eastern Arctic. This case is particularly interesting because it involves conflicts between "indigenous ways of knowing" and scientific research. The bowhead whale is an endangered species, and as a result, the Inuit agreed to a moratorium on hunting the animal in the 1970s because of a depleted stock. Bowing to pressure from aboriginal leaders who claimed that the hunt was necessary to preserve Inuit cultural identity in the 1990s, however, the federal government agreed that a quota for harvesting bowheads would be considered following the presentation of the preliminary findings of a traditional knowledge study that was to be undertaken by the Nunavut Wildlife Management Board.[43]

The traditional knowledge study was based on anecdotal information and opinions from Inuit hunters. These hunters believed that the number of whales had increased significantly since the 1960s. Their claims, however, were contested by Kerry Finley, a scientist who has studied

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[40]"When a Whale Is a Culture", *Globe and Mail,* December 4, 1999.

[41] This is the conclusion of the Sea Shepherd Society, which claims to have obtained documentation through the Freedom of Information Act (US) in October 1998, revealing the Makah Tribal Council's plans to start a whaling industry with Norway and Japan as clients. According to the Sea Shepherd Society, "an email dated April 1995, from Michael Tillman, Deputy Commissioner at the Southwest Fisheries Science Center of the National Marine Fisheries Service, to NMFS colleague Margaret Hayes and several others relates a conversation between Hayes and Makah legal representative John Arum, saying "Maggie informed me that Arum had told her that Japanese interests had approached the Makahs about seeling whale meat to them. So I wasn't surprised when he asked me generally about commercial sale". Sea Sheperd Conservation Society, "Makah Grey Whale Hunt to be First Step in Commercial Enterprise", 1998.

[42] The aboriginal legal scholar John Borrows makes this argument with respect to all economic activity. He maintains that even the designation of commercial gambling as an aboriginal right can be justified if this will aid indigenous survival. John Borrows, "Frozen Rights in Canada: Constitutional Interpretation and the Trickster", *American Indian Law Review*, 22:1, 1997/1998, pp. 37-64.

[43] Kim Goldberg, *Canada's War on Whales: Can the Bowhead Survive?* A Report Prepared for the Canadian Marine Environment Protection Society, July 2001.

bowheads for 25 years. Finley maintained that the hunting of even one whale would be unsustainable because of the particular characteristics of the bowhead population – its small size, low reproductive capacity and the high likelihood that it is comprised of very old individuals.[44]

Finley also pointed to some of the problems in uncritically accepting the opinions of aboriginal hunters, maintaining that "opinions…cannot be accepted as proof that something is true…". He noted that socioeconomic factors could have led to erroneous local knowledge perceptions that the bowhead population has increased, since the availability of powerboats would give hunters "increased opportunities to see [bowheads] and the ability to report these sightings". In addition, Finley cautions that all opinions "must withstand scrutiny for potential biases considering political context, vested interests, and the pitfalls of leading questions and circular reasoning". It is likely, in fact, that the hunters' opinions about population numbers were biased since they were aware that "federal permission to hunt bowhead in the Eastern Canadian Arctic was contingent on satisfactory results of the bowhead traditional knowledge study".[45]

These problems with traditional knowledge, however, have been ignored by the Department of Fisheries and Oceans, COSEWIC, and even the World Wildlife Fund. The "politically sensitive nature of the issue" has compromised the scientific research that has been undertaken. Finley's estimates on the bowhead, which would have lead to the conclusion that even a small hunt could not be sustained, were shelved, and Finley maintains that "the sub-committee [of COSEWIC] was stacked against an objective review". This appears to have been confirmed by the call for bids for a new bowhead status report, which now "has a new secrecy clause, ordering the author, 'not to use, copy, divulge or publish the report'". According to Finley, "they want to get somebody who will give them the numbers they want, obviously. They've been working on these reports since 1990 [without accepting one]. It's quite ridiculous."[46]

Another example of the conflict of interest that arises when the local knowledge of hunters is used to determine species at risk can be seen in the case of the polar bear. Although this example does not involve "western lands", it sheds some light on the problems of accepting that there are "indigenous ways of knowing". In 1973, Canada signed the International Agreement on the Conservation of Polar Bears and their Habitat,[47] but the conservation of this species is being challenged by the Nunavut government's adoption of Inuit traditional knowledge (known as Inuit *Qaujimajatuqangit* or IQ) as "a guiding philosophy".[48] Environment Canada also uses traditional knowledge "to provide information on polar bear abundances, movements,

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[44] Goldberg, p. 13.

[45] Goldberg, p.14. For Finley's original discussion of this see K.J. Finley, "Natural History and Conservation of the Greenland Whale, or Bowhead, in the Northwest Atlantic", *Arctic*, 54(1), March 2001, p. 65.

[46] Goldberg, p. 13.

[47] J. Lentfer, "Agreement on the conservation of polar bears", *Polar Record*, 17(108), 1974, pp. 327-330.

[48] George Wenzel, "From TEK to IQ: *Inuit Qaujimajatuqangit* and Inuit cultural ecology", *Arctic Anthropology*, 41(2), 2004, pp. 238-250.

behaviours". It asserts that this information provides a "valuable long-term perspective on changes in the population".[49]

But the incorporation of traditional knowledge, as in the bowhead case, has conflicted with the scientific estimates of polar bear populations. Scientific data suggest a decline in polar bear populations,[50] but "the IQ from the Baffin Bay and Western Hudson Bay polar bear population areas indicated an increase in polar bear sightings that was believed to have been caused by population growth…". While the scientific calculations maintained that polar bear populations "had dropped below 90% of the target numbers by 2006" and so the Government of Nunavut "was… in a position to impose a hunting moratorium in both Baffin Bay and Western Hudson Bay", the government increased hunting quotas from 111 to 161 bears per year in 2005. This increase, justified by Inuit traditional knowledge, occurred because of the "cultural value of bear hunting, safety concerns raised by community residents, and the political climate in Nunavut".[51]

"The political climate in Nunavut", however, has not received much attention in the literature. Martha Dowsley, a geographer researching the conflict between IQ observations and scientific research, does not raise this issue. Instead, she maintains that the discrepancy could be due to scientific studies underestimating polar bear numbers or increased local densities due to polar bear immigration from other areas, perhaps because of the stress of climate change.[52] Dowsley, in another article written with George Wenzel, also suggests that differences in the Inuit "paradigm for viewing the world and the place of humans in it…" could account for the discrepancy.[53] It is noted that,

> for Inuit, hunting plays a key role in cultural identity…and is essential to developing and maintaining human-animal relations and also humanhuman relationships…. Directly from the relationship between hunter and prey (as food provider) comes the necessity to share that food with other people in order to fulfill one's relationship obligations to the hunted species and to other humans who also share food. In this way, hunting ties people to each other as well as to animals. Furthermore, the IQ principles of Nunavut stress that animals and land are not owned and therefore people must show respect for them and avoid disputes over them….[54]

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[49] http://www.ec.gc.ca/nature/ (accessed October 2010).

[50] Stirling et al., "Long term trends…" and I. Stirling and C.L. Parkinson, "Possible effects of climate warming on selected populations of polar bears in the Canadian Arctic", *Arctic*, 59(3), 2006, pp. 261-275.

[51] Dowsley and Wenzel, p. 179.

[52] Martha Dowsley, "Inuit Perspectives on Polar Bears and Climate Change in Baffin Bay, Nunavut, Canada", *Research and Practice in Social Sciences*, 2(2), February 2007, pp. 53-74..

[53] Dowsley and Wenzel, pp. 177-8.

[54] Dowsley and Wenzel, pp. 184-5.

This "paradigm for viewing the world" means that the polar bear are perceived "to be threatened by the very existence of the quota system". This is because quotas are seen "as bragging about hunting ability by predicting the number of bears that would be harvested and as acting outside the human-bear relationship by limiting the harvest to fewer bears than might present themselves". It can also lead to "fighting over hunting tags", which is seen as being disrespectful to the bears.[55] "Disrespectful hunting", is thought to drive animals away, "while respectful hunting could draw animals towards humans…". As a result, aspects of IQ make "the scientific perspective that the level of hunting influences population size…a difficult concept" to accept.[56] This reluctance of traditional knowledge to accept the connection between aboriginal overhunting and wildlife species depletion also has been noticed in studies of the decline in the thick-billed murre populations.[57]

But the obvious explanation that Dowsley and Wenzel do not explore concerns the interests that are influencing Inuit "ways of knowing". This interest is not just due to the "cultural value of bear hunting". Although hunting quotas are supposed to be used by Inuit communities, a small number of hunting tags can be sold to non-indigenous trophy hunters who spend approximately $30,000 per hunt.[58] The hunt thus provides business opportunities for outfitters, hotels, and other tourist services, and "sports hunting of polar bears in the Nunavut province alone has been estimated to pull in profits of C$2.9 ($2.4 million) annually". Therefore, restrictions on polar bear hunting would cut off a revenue source for Inuit communities.[59]

The issue of a direct conflict of interest becomes particularly pronounced, therefore, when an aboriginal person is involved in the commercial exploitation of natural resources. In the case of fishing disputes on the west coast, for example, aboriginal peoples are profiting from catching salmon. As a result, they will have a financial interest in increasing their catch, and they should be subject to regulations just like other commercial harvesters.

In addition to aboriginal participation in commercial activities, concerns should be raised about the effect of indirect native involvement in industrial development. This is because the notion that aboriginal people have a "covenant with the Creator" gives the impression that aboriginal people are inherently environmentally sensitive. As a result, their endorsement of activities

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[55] Dowsley and Wenzel, p. 185.

[56] Dowsley and Wenzel, p. 185.

[57] G. Gilchrist et al., "Can local ecological knowledge contribute to wildlife management? Case studies of migratory birds", *Ecology and Society*, 10(1), 2005, http://www.ecologyandsociety.org/vol10/iss1/art20 (accessed October 2010).

[58] Tiffany Crawford, "Canadian Polar Bear Hunt Sparks Angry Condemnation in Europe", *Edmonton Journal*, March 21, 2009, p. A4. Boyd Warner, a Yellowknife outfitter who owns Adventure Northwest, charges trophy hunters (usually from the United States), $29,500 to kill a polar bear. Of this amount, $23,000 "goes back into the community by paying local people to outfit and guide the hunt".

[59] John Platt, "Will Canada ban polar bear hunting?", *Scientific American*, April 17, 2009.

carries a certain weight even if they are environmentally destructive. Aboriginal peoples can be used as a public relations prop to greenwash unsustainable industrial processes.

Greenwashing the Tar Sands

Over the last ten years, the opposition to the tar sands in northern Alberta has increased. This is because the environmental impacts associated with this development have become more apparent. The Alberta Cancer Board found a higher than expected number of cancers among residents of Fort Chipewyan, but "suggested that it could be due to a statistical anomaly in the town of only 1,200".[60] While Alberta Health Services has taken the position that "the rate should not be cause for alarm", Environment Canada has conducted studies that show high levels of deformities in the embryos of fish. David Schindler, an ecologist at the University of Alberta, has also completed studies in 2008 linking the tar sands to the release of toxic metals and chemicals.[61]

Opposition to the tar sands is particularly pronounced in northern Alberta aboriginal communities. These communities are located close to these developments, and therefore have an interest in ensuring their health is protected. The residents of Fort Chipewyan have been sounding the alarm for years about high rates of cancer and other illnesses, and most "believe the disease is caused by air and water pollution from oilsands development, which they say also contaminates the wild foods they eat".

These concerns have led environmental groups to make alliances with some aboriginal groups to put pressure on the Alberta government and the oil and gas industry. Aboriginal leaders from the Northwest Territories and northern Alberta recently travelled to Washington, D.C. to call upon the U.S. government reject a proposed pipeline that would transport 900,000 barrels of oil per day from the tar sands to the United States. The issue even prompted movie director James Cameron to visit the region, where he promised to help aboriginal groups pursue legal action against the federal and provincial governments in an effort to stop water pollution from the tar sands.

Although the discussion of the impact of the tar sands on water quality, wildlife and human health has largely relied on emerging scientific studies, the incorporation of aboriginal traditional knowledge also has been mentioned. Oil companies have expressed their appreciation for the role that traditional knowledge can play in the monitoring and amelioration of tar sands development. Suncor, for example, notes that "the best reclamation plan is one that blends contemporary science with generations' worth of traditional knowledge".[62] Shell maintains that it has "used Traditional Environmental Knowledge (TEK) by consulting First Nation Elders in the region in the development of our land reclamation plan", and aboriginal representation on its land use reclamation committee has helped it to "establish the final design" for this plan.[63]

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[60] Hanneke Brooymans, "Cameron pledges help until its fixed", *Edmonton Journal*, September 29, 2010, p. A1

[61] Brooymans, "Cameron pledges help until its fixed", p. A1

[62] http://sustainability.suncor.com/2009/en/responsible/994.aspx (accessed October 2010)

[63] Shell, "Canada's Oil Sands: Issues and Opportunities".

Finally, Imperial Oil asserts that traditional knowledge will help in "land contouring, selecting the right vegetation and learning more about local fish and wildlife habitats….". Consultations with elders, according to Imperial, led them to understand that "Kearl Lake is too shallow for fish to survive over the winter", and so it "altered its reclamation plans to include three smaller but deeper lakes, instead of one large lake, to improve water flow and oxygen levels".[64]

Total E&P Canada Ltd. even provided funds so that the Fort McKay First Nation (through FMA Heritage Resources Consultants Ltd.) could prepare a "Traditional Knowledge Report" on the proposed Joslyn North Mine Project. In the report, Traditional Ecological Knowledge is defined as "the wisdom and understanding of a particular natural environment that has accumulated over countless generations and can serve to aid Western scientific disciplines in analyzing project effects". These effects include those that relate to the project (noise etc.) and aboriginal culture (health and socioeconomic factors), but also "to the environment (e.g. wildlife, vegetation, fisheries, and aquatic resources, hydrogeology, geology and terrain, climate, soils, palaeontology and air quality)".[65]

But how does Traditional Ecological Knowledge's "wisdom and understanding" differ from "Western scientific disciplines"? The report contains four pages of "results", but this mostly consists of the "concerns" of various aboriginal people and statements that traditional activities continue to be important for the group. Any "knowledge" that is provided is merely vague observations such as the following: that water levels have never been "so low" and there has been a "decrease in wildlife".[66] The section on "cumulative effects" merely offers the following statement:

> Elders made some comments expressing their concern regarding overall development in the area. One elder stated that many trappers he knows think that 'it's not right' what industry has done to the land, calling it 'a shame'…. Another Elder, speaking about her father, said that, 'He has been trapping all his life' and the effects of industry on the land are 'heartbreaking' for him….[67]

It is hard to see how this kind of information "can serve to aid Western scientific disciplines in analyzing project effects".

With the exception of the understanding that a lake was "too shallow for fish to survive over the winter" – a contention that would not be particularly surprising to scientists studying ecosystems - not many examples of the traditional knowledge's contribution to "understanding the particular natural environment" and "[aiding] Western scientific disciplines" are provided. The

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[64] http://www.canadasoilsands.ca/en/what-were-doing/social-impacts.aspx (accessed October 2010).

[65] FMA Heritage Resources Consultants Inc., *Fort McKay First Nation Traditional Knowledge Report*, July 2008, p.2.

[66] FMA Heritage Resources Consultants Inc., p. 16.

[67] FMA Heritage Resources Consultants Inc., p. 17.

information, in fact, is community impressions such as "complaints about bad taste, suspicious tumours and things like that." These observations also have been made by non-aboriginal anglers who have also claimed that "the number of…deformed and disturbing catches is growing". Although these observations could be correct, they are very different from the specificity of data that are used in scientific studies. The accuracy of these data is increased by numerous instruments. The Government of Canada, for example, is currently developing a "'fingerprinting' machine that can help determine if substances are naturally occurring or are from the oilsands". According to Jim Prentice, the federal Environment Minister, this machine will enable the government "to test in the water and determine where any substances came from", thereby determining their presence and "[tracing] them back to their source."[68] How would local knowledge be able to contribute to this information?

What is apparent from the "indigenous ways of knowing" concerning the tar sands is that these imprecise and unsystematic observations are not being used to improve scientific research. Their incorporation is being promoted presumably out of the condescending desire to "respect" the traditions of western native groups. Although this is seen as a harmless way to "recognize" aboriginal culture, it has a downside; oil and gas companies are using traditional knowledge so as to garner public support for their activities. Traditional knowledge is acquired so as to "greenwash" the tar sands since it is assumed that "indigenous ways of knowing" would never condone the destruction of "Mother Earth". This can be seen in an effort by Shell Oil to portray its activities as environmentally friendly. A half-page advertisement in the *Globe and Mail* on January 26, 2002, for example, noted that "an elder from the local community….is helping us to see the environment from a new perspective. She's teaching us about Traditional Environmental Knowledge…we're applying what we're learning not just to improve our Athabasca Oil Sands Project, but to ensure we respect the needs of generations to come".[69]

This tactic is not particular to the tar sands. "Indigenous ways of knowing" were used to support a diamond mine development in the Northwest Territories, when governments and industry funded traditional knowledge studies as an incentive to allow development to proceed. Although mine executives declared that they did not know what traditional knowledge was or how it could contribute to the environmental assessment of the mining development, they agreed to pay for the research that was being undertaken, presumably to provide a financial incentive for aboriginal groups to go along with the project. In this way the project, by being vetted by traditional knowledge findings, was given an artificial legitimacy.[70]

And it is not just funding for traditional knowledge studies that are being provided by the oil and gas industry. The Government of Alberta, for example, notes that "in 2008, the value of contracts between Alberta oil sands companies and Aboriginal companies was $575 million, up from $412 million in 2006" and that "since 1999, Aboriginal-owned companies across Alberta, including

[68] Bob Weber, "Sick Fish", *The Canadian Press*, September 16, 2010.

[69] For further discussion of this example, see Widdowson and Howard, *Disrobing the Aboriginal Industry,* p.246.

[70] See Widdowson and Howard, *Disrobing the Aboriginal Industry,* pp. 3-8 for an elaboration of this case.

those in the oil sands region, have earned more than $3 billion".[71] A good example is the Athabasca Oil Sands Project (ASOP) that ensures that

> jobs, business experience, and profits will flow into the Athabasca Chipewyan First Nation (ACFN) from a $97 million catering, housekeeping, and maintenance contract for Albian Village, a 2500-person world-class camp built to accommodate workers on Shell's oil sands mining sites. Shell is also providing transportation and accommodation for members of the ACFN who live 300 kilometres away. The benefits of this contract go far beyond wages. The contract will help the ACFN business group gain valuable business ventures. Shell also contributes to a number of Aboriginal education and training programs, including BEAHR, Trades in Motion, and Sunchild E-learning that are implemented in community.[72]

Imperial Oil has implemented a Native Internship Program and EnCana and ConocoPhillips have donated $1.2 million to a training program for aboriginal students at Keyano College, which is "helping create a local, skilled workforce trained in the environmental fields the industry needs". Encana also provides contracts to an aboriginal owned company to service its wells and Petro-Canada "collaborates with First Nations communities to ensure oil sands operations are based on mutual interests". It provides the Mikisew Cree, Athabasca Chipewyan and Fort McKay First Nations with a number benefits "that are meaningful to their communities", including educational opportunities and "offering summer student employment programs and assisting with transitioning from high school to postsecondary education".[73] Providing these benefits will obviously make it much more difficult for these aboriginal groups to oppose tar sands development.

The use of various financial incentives to buy aboriginal support is related to the problem of a separate, native controlled, regulatory environment. Such a trend will lead corporations to target aboriginal lands for development. Aboriginal people constitute the most economically marginalized segment of Canadian society, and as such, they will have the least power to resist offers from polluting industries to relocate in their jurisdiction. This problem can already be seen globally, where industry is moving to impoverished countries where regulations are lax, instead of being subjected to the environmental controls that are present in more politically developed western countries. "Indigenous ways of knowing", because it is based on opinion and not fact, can be used to justify such a circumstance.

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[71] Government of Alberta, "Facts about Alberta's oil sands: Aboriginal involvement in the oil sands", August 2010.

[72] "Aboriginal engagement in the mining and energy sectors", http://www.nrcan.gc.ca/mms-smm/abor-auto/eng-eng/tal-hyd-eng.htm (accessed October 2010).

[73] http://www.canadasoilsands.ca/en/what-were-doing/social-impacts.aspx (accessed October 2010).

Epistemological Relativism and Policy Development

In addition to the two problems of uncritically accepting "indigenous ways of knowing" identified above - being condescending to aboriginal people and glossing over conflicts of interest - there are two other difficulties that pertain to the promotion of epistemological relativism more generally. Accepting that there are different "ways of knowing" is an obstacle to understanding environmental impacts and is dependent upon conflating science with capitalism.

The three environmental issues discussed in this paper – global warming, endangered species and the tar sands – raise important scientific questions. Is the climate warming? If so, how much and what are the likely impacts? Are polar bears and bowhead whales endangered? What environmental and health consequences are resulting from tar sands developments? How these questions are answered will impact public policy development because, in order to be effective, government action or inaction must be based upon the best information that is available.

Therefore, it is difficult to see how epistemological relativism, by maintaining that there are different "ways of knowing", can contribute to improved environmental policies. What it actually does is aid the process of "manufacturing uncertainty", where governments delay decision making on the basis that negative environmental impacts have not been "proven".[74] Policies to protect polar bears and bowhead whales are obstructed because pandering to "indigenous ways of knowing" makes it easier for governments to avoid embarking upon politically dangerous decisions.

One common response, to this defense of scientific methods in the postmodern era, is that science itself has been inadequate to protect the environment. In the case of the tar sands, for example, the Alberta government has used the scientific research it undertakes to justify its claim that there is no correlation between the tar sands and human health problems. But the government's research relies on data provided by the oil and gas industry, and therefore its objectivity is compromised. The failure of the government to protect the health of aboriginal communities, therefore, is not due to the inadequacies of science but the corporate interests that are distorting tar sands monitoring.[75]

All the discussions of "indigenous ways of knowing", in fact, are a distraction from the main problem that is facing the environment – an unsustainable economic system that is maintained through coercion and deception. The fact that capitalism has resulted in widespread environmental destruction, regardless of the spiritual beliefs of the cultures that have been absorbed into its orbit, indicates that this mode of production is a major contributor to the problem. It is the imperatives of this system, and its fundamentally unsustainable character, that needs to be examined. Assuming that certain cultures are innately predisposed to protecting the environment, regardless of their connection to capitalism, is a distraction from attempting to understand how this very important reality is impacting western lands.

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[74] For a discussion of this respect to the difficulties in banning toxic chemicals, see Michaels, "Doubt is their product", *Scientific American*, June 2005, pp. 96-101.

[75] Weber, "Sick fish".