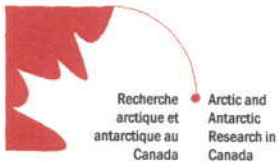

Indicators of Canadian Polar Knowledge
1999

Canadian Polar Commission
June 2001

Canada

The Canadian Polar Commission

The Canadian Polar Commission is Canada's national advisory agency on polar affairs. It has responsibility for:

monitoring, promoting, and disseminating knowledge of the polar regions;

contributing to public awareness of the importance of polar science to Canada;

enhancing Canada's international profile as a circumpolar nation; and

recommending polar science policy to government

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Printed in Canada

Canadian Cataloguing Publication Data

ISSN 1494-5320

Foreword

Through this report the Canadian Polar Commission continues fulfilling its mandate to monitor and report regularly to the public on the state of polar knowledge in Canada.

The Indicators Project commenced in 1999. It involves interested individuals and organizations in a process of defining and collecting data for a series of carefully chosen indicators or "signals" that reflect the state of Canada's progress in the realm of polar knowledge.

There are now 15 of these indicators. They range from the state of co-management research, to the occurrence of polar matters raised in House of Commons debates, to the number of Canadian university courses on polar-related subjects. This year we added a new indicator: published works of fiction by northern Canadian authors. Each one is designed to allow precise replication from year to year and is based on a set of methodological rules to guide data collection.

Readers of our first indicators report, *Developing Indicators on Canadian Polar Knowledge: Establishing the 1998 Baseline*, will no doubt be waiting for developing trends in the data. We ask you to read this report with potential trends in view, but also to bear in mind that in most cases it is too early to comment on trend development. We also note that methodological refinements this year required adjusting the 1998 baseline, a common occurrence in indicators work.

This report will be sent to all relevant federal, provincial and territorial ministries, and to our research partners. It will also appear on the Polar Commission website (www.polarcom.gc.ca).

We urge you to read it with an eye for potential improvements, whether in policy or elsewhere and in the best Canadian tradition of making the most of available resources.

Mike Robinson
Chair, Canadian Polar Commission

Introduction

This report presents findings from the second year of our indicators project. It contains a short statement on research methods, a brief description of each indicator, and a breakdown of findings, followed by conclusions. Findings include data from the 1998 baseline of last year and new data for 1999. Because research methods are being refined, some 1998 figures have been adjusted.

Indicators can provide tools for tracking tendencies and changes over time. Our intention is to monitor trends in various fields to obtain a general picture of the state of Canadian Polar knowledge in order to report and advise governments and other agencies on decision-making and policy.

To appreciate the scope of this report it must be seen in a larger context. Indicators are generally regarded as useful only after data have been collected for a considerable time, and even a full time-series will not give a complete picture. This report contains data for only two years.

These indicators do however highlight key areas of Canadian polar knowledge; they also present considerable information that proved useful as we refined our research methods.

Methods

The indicators project drew its impetus from a polar research and knowledge workshop the Commission hosted in Inuvik in the spring of 1999. A series of sectorial consultations followed, with feedback synthesized into a document distributed to all participants for review and comment. This process led to selection of 14 indicators to begin establishing a baseline for reporting on the state of Canadian polar knowledge. For the purposes of this project, "polar" means the Arctic and Antarctic regions, and "knowledge" includes scientific knowledge and the traditional knowledge of northern peoples.

This year we have concentrated on refining the research methods, aiming for clarity, constancy, and replicability. Ease of data collection varies considerably among indicators: the indicator on refereed journal articles, for instance, demanded considerable rigour and effort, requiring precise and detailed selection rules. For others, obtaining data is relatively straightforward. Almost every indicator involves collaboration from other agencies and institutional partners.

Collection methods are continuously evolving. Many of our research partners have developed substantial information systems, some accessible on-line. New search tools can significantly improve data collection for some indicators, while for others search tools need adjusting in order to take advantage of on-line information systems. We are refining our definitions of terms, and standardizing key words and selection criteria to ensure consistency and bring coherence to the project as a whole. We are also compiling a research compendium of detailed methods for each indicator.

RESULTS

Indicator 1
Collaborative research undertaken through co-management agreements

This indicator points to collaboration in research carried out through northern co-management agreements. With the exception of the West Kitikmeot/Slave Study, the focus has been restricted to co-management regimes under formal land-claim agreements. The complexity and variability of the scope and definition of these agreements present a challenge for data collection on this indicator. The number and associated dollar values of cooperative research projects were extracted from the annual reports of the identified Aboriginal groups for the fiscal year of 1999-2000. A new co-management regime, Nunavut, has been added.

Organization	1998		1999	
	Projects	$ 000	Projects	$ 000
Kativik Regional Government	2	871	0	0
Makivik Corporation	2	106	0	0
West Kitikmeot/Slave Study	16	1140	14	1415
Inuvialuit Co-Management Group	63	1324	55	1644
Gwich'in Renewable Resources Board	21	411	19	252
Nunavut Wildlife Management Board	N/A	725	N/A	1246
Total	90	2995	88	4557

Indicator 2
Polar symposia and conferences held in Canada

This indicator deals with the initiative of Canadian organizations in staging national and international events with a polar focus. Key points of contact for such information include: the Association of Canadian Universities for Northern Studies; federal departments involved in polar research; academic journals; newsletters; and other organizational publications.

Number of symposiums and conferences	
1998	1999
10	5

Indicator 3
Peer-reviewed articles relevant to Canadian polar knowledge

Publication in refereed journals is a key yardstick of academic achievement. It is also the chief avenue for communicating scientific knowledge. We reviewed 57 journals representing various fields of polar knowledge from a list developed in consultation with a multi-disciplinary team of polar experts.

	1998	1999
Number of journals used	57	57
Number of articles	218	222

Indicator 4
Studies of polar subjects supported by granting agencies

This indicator gauges academic funding for polar research by major federal granting agencies. This includes the Natural Sciences and Engineering Research Council (NSERC), the Social Sciences and Humanities Research Council (SSHRC), and the Canadian Institute of Health Research (CIHR). Given the absence of geographic references and standardized search mechanisms, data collection is a challenge. We developed a standardized list of keywords and selection rules designed for data collection for use when only the title is available.

	1998		1999	
Agency	# projects	$ 000	# projects	$ 000
Natural Sciences and Engineering Research Council	82	4365	85	4410
*Social Sciences and Humanities Research Council	37	1081	30	1200
** Canadian Institute for Health Research	16	555	2	43
Total	135	6001	117	5653

* 1999 figures had to be estimated
** in 1998 data were listed under the Medical Research Council (MRC)

Indicator 5
Occurrence of polar issues raised in House of Commons debates

This indicator serves to reveal the level of public interest in polar matters. Hansard can be searched electronically using pre-selected keywords, and then individual records reviewed. Some remaining technical difficulties need to be addressed, and therefore no data are presently available.

Indicator 6
Research projects with traditional knowledge component

The traditional knowledge (TK) of northern peoples is a significant feature of Canadian polar knowledge. While it is impossible to monitor the state of TK in a project such as this, it can be useful to track research projects incorporating it. We searched the Arctic Science and Technology Information System (ASTIS) database using keywords and also manually, looking for license applications that involved TK, and contacting agencies directly to obtain missing data.

Number of Projects	
1998	1999
37	35

Indicator 7
Distribution of polar researchers by discipline

This indicator, currently under development, will help provide a profile of Canada's polar research community. Data will be drawn from the Canadian Polar Information Network's Researchers Directory, now under construction.

Indicator 8
Northern Scientific Training Program recipients

This indicator provides an idea of the interest in polar studies shown by young researchers. Data are gathered from an extensive Northern Scientific Training Program (NSTP) database.

	1998		1999	
Discipline	Amount Spent ($ 000)	Students	Amount Spent ($ 000)	Students
Physical Sciences	155	66	212	84
Life Sciences	302	116	287	106
Social Sciences	156	63	148	54
Total	613	245	647	244

Indicator 9
University courses in polar-related subjects

This indicator offers a window into the degree of interest in polar subjects by Canadian universities. The Association of Canadian Universities for Northern Studies (ACUNS) provided data by searching university calendars from across Canada.

	1998*	1999
Number of universities offering polar-related courses	20	36
Number of polar-related courses	71	238

* 1998 data were obtained from an incomplete data set

Indicator 10
Polar research licenses granted

With the exception of provincial jurisdictions, most polar research in Canada is licensed through government agencies; this indicator is therefore a good measure of such activities. Current data are obtained from the ASTIS database. Licensing agencies were contacted directly to fill in any missing data.

Licensing Agency	Licenses issued	
	1998	1999
Government of Canada	56	54
Fisheries and Oceans		
Yukon		
Science and Exploration	32	50
Archaeological Site Permits	21	19
Northwest Territories		
Scientific Research Licenses	66	69
Wildlife Research Permits	76	57
Archaeological Permits	25	10
Nunavut		
Scientific Research Licenses	109	89
Wildlife Research Permits	N/A	35
Archaeological Permits	N/A	7
Total	385	390

Indicator 11
Student theses on polar subjects

Graduate school provides important training for a career in polar research. This indicator gives insight into the renewal of Canada's polar research community. The National Library of Canada registry captures approximately 85% of all Canadian graduate theses published. We used our standardized keywords and selection rules, and their search engine, to collect this information.

	Number of Theses	
Level	1998	1999
Masters	47	76
Doctorate	39	35
Total	86	111

Indicator 12
Northern students enrolled in university programs

Post-secondary education is a vital feature of the current economy and capacity-building is a critical issue for remote communities. This indicator provides the number of northern students enrolled in post-secondary education across Canada. Data are collected through provincial and territorial governments responsible for funding student assistance (Northwest Territories, Nunavut, Yukon, Newfoundland and Labrador, Northern Quebec).

Region	Number of Students	
	1998	1999
Yukon	371	373
Northwest Territories	197	N/A
Nunavut	50	65
Northern Quebec	44	34
Labrador	317	339
Total	979	811

Indicator 13
Newspaper articles relevant to Canadian polar matters

News media coverage provides a gauge of public interest in Canadian polar issues. This indicator used the search engine *Eureka* and pre-selected keywords to collect relevant items from *La Presse, Le Soleil, The Globe and Mail,* and *National Post*.

Newspaper	Number of Articles			
	Arctic		Antarctic	
	1998	1999	1998	1999
Globe and Mail	273	290	22	26
**National Post*	79	111	2	1
La Presse	64	89	17	14
Le Soleil	73	71	2	6
Total	489	561	43	47

* 1998 data was obtained from the *Financial Post*

Indicator 14
Industrial research assistance grants

Private-sector activity in polar regions often involves significant research and development. This indicator provides a measure of the funds given by Industry Canada through the Industrial Research Assistance Program (IRAP), chiefly to medium and smaller scale businesses, for research and development in the Canadian north.

Region	Number of Projects		Funding $000	
	1998	1999	1998	1999
Yukon	8	4	83	26
NWT	16	31	323	189
Nunavut	N/A	1	N/A	8
Nunavik	0	0	0	0
Labrador	2	4	186	23
Total	26	40	592	246

Indicator 15
Fiction publications by northern Canadian authors

In measuring the number of fiction publications (novels, short stories, and poems) by northern Canadians this indicator recognizes the importance of literature in communicating polar knowledge to the public.

	1998	1999
Children's fiction	4	12
Adult fiction	0	2
Total	4	14

CONCLUSION

As mentioned, our work this year has brought refinements to research methods. Selection rules allow systematic replication of individual indicators, while standardized keywords and definitions bring coherence and consistency. The process of refining and strengthening indicators will continue as the project evolves. The research compendium now being compiled will hold selection rules for each indicator, justifications of methods, definitions, keywords, and other relevant information. This will allow consistent data collection and replicable methods from year to year.

The peer-reviewed journal indicator now includes articles on research in the Canadian north by authors affiliated solely with foreign institutions; these data were relatively straightforward. The House of Commons indicator is stronger now that it applies to debates rather than questions; but problems with the Hansard on-line search engine have prevented retrieval of information this year. Other new search engines, especially new ones focussing on newspaper articles, have facilitated data collection and significantly improved results. Certain partnership agencies were unable to provide data this year because of restructuring, and others may not have the budget, time, or staff to retrieve requested information.

Over the next few years we will be able to undertake more meaningful analysis of the data presented in this report. For example, a great deal of information has been obtained from 57 journals and 440 articles for the peer-reviewed articles indicator. Articles from the natural sciences, particularly the earth and biological sciences, constitute the majority. Most social science articles deal with Aboriginal peoples. Collaboration is a significant trend, not only between various university departments across the country, but also among researchers from academia, government, and the private sector. Eight authors changed affiliation from a foreign to a Canadian institution, while 26 authors changed from a Canadian to a foreign affiliation.

As we reflect on the process and results so far, we can see that it contains a degree of bias: it emphasizes the physical sciences, and contains more data on federal programs and agencies than from provincial, territorial, or local sources. While we intend to work diligently to reduce it, we recognize that a degree of inherent bias will always remain.

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ACKNOWLEDGEMENTS

The Indicators Report for 1999 is the result of the collective effort, support, and cooperation of many individuals and organizations. Specifically I want to thank Ms. Elaine Anderson, Canadian Polar Commission; Ms. Rhonda Turner, Department of Indian Affairs and Northern Development; Ms. Sandra Malcolm, Association of Canadian Universities for Northern Studies; Mr. Richard Binder, Canadian Polar Commission; Mr. Alan Maconnachie (volunteer); Mr. Bob MacQuarrie (volunteer); Ms. Eileen Goodrum, National Research Council; Ms. Carole Theriault, Department of Education,Yukon; Ms. Laurie Morton and Ms. Kathryn Moore, Department of Education, Culture and Employment, NWT; Mr. Frank Cholette and Mr. Hayward Harris, Department of Education, Newfoundland and Labrador; Ms. Mary-Kae Pameolik, Department of Education, Nunavut; and Mr. Jacques Lavigne, Department of Education, Quebec, for their assistance with data collection.

Special thanks go to Mr. Ross Goodwin and his team, Arctic Science and Technology Information System, Arctic Institute of North America, and Dr. David Lertzman, Canadian Polar Commission for their dedicated and outstanding work on the indicators report. My acknowledgement and special thanks are also conveyed to Mr. Jean-Marie Beaulieu, without whose tenacity and hard work the indicators report would not be possible.

Steven C. Bigras
Executive Director

Glossary

ACUNS–Association of Canadian Universities for Northern Studies
ASTIS–Arctic Science and Technology Information System
CIHR–Canadian Institute for Health Research
CPC – Canadian Polar Commission
INAC–Indian and Northern Affairs Canada
IRAP–Industrial Research Assistance Program
NSRC–Natural Sciences Research Council
NSTP– Northern Scientific Training Program
SSHRC–Social Science and Humanities Research Council
TK–Traditional Knowledge