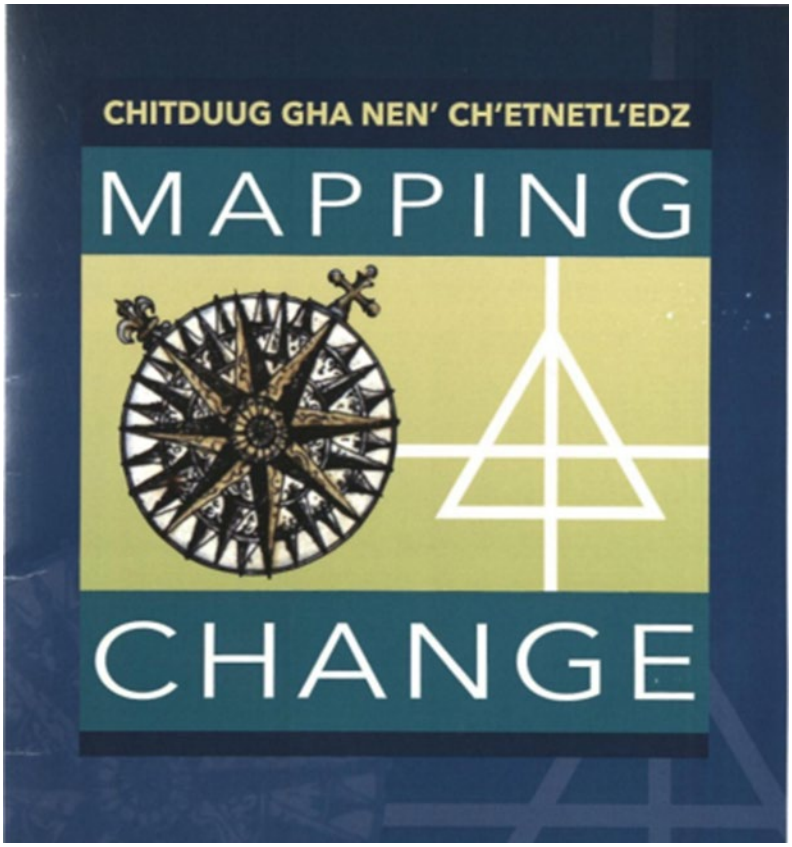
PROCEEDINGS

26th Polar Libraries Colloquy

Mapping Change: Chitduug Gha Nen' Ch'etnetl'edz



Papers, posters, and keynote presented
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Copyright and Online Availability

CONTENTS

LIST OF 2016 PLC ATTENDEES, INSTITUTIONS, AND COUNTRIES REPRESENTED

PLC was small in number this year, but that did not dampen the enthusiasm of the group. Librarians, professionals, and information specialists officially registered at the 2016 Colloquy in Fairbanks were:

Bev Ager
Katherine Arndt
Stéfano Biondo
Joë Bouchard
Marcel Brannemann
Christann Burke
Sandy Campbell
Daria O. Carle
Marvin Falk
Betty Galbraith
Andrew Gray
Suzan Hahn
Liisa Hallikainen
Gloria Hicks
Ronald Inouye
Laura Kissel
Peter Lund
Ritva Mäntylä
David Ongley
Susanna Parikka
Shelly Sommer
Sharon Tahirkheli
Judie Triplehorn
Trip Triplehorn
Shannon Christoffersen Vossepoel

University of Alaska Fairbanks presenters and staff included:

Brian Barnes, Director, Institute of Arctic Biology
Grace Bieber, Rasmuson Library
Suzanne Bishop, Rasmuson Library
Terrence Cole, Professor of History and Northern Studies
Marvin Falk, Professor Emeritus, Rare Books and Maps, Rasmuson Library
James Kari, Professor Emeritus, Alaska Native Language Center
Leslie McCartney, Oral History Program, Rasmuson Library
Ben Potter, Professor of Anthropology
Mike Powers, Interim Chancellor
Angela Schmidt, Film Archivist, Rasmuson Library
Mike Sfraga, Vice Chancellor for University and Student Advancement
Rose Speranza, Vice Chancellor for University and Student Advancement
Amy Topkok, Coordinator, Pavva Iñupiaq Dancers

Twenty libraries, centers, institutes, or other entities from five countries were represented:

Canada
- Arctic Institute of North America, University of Calgary, Alberta
- John W. Scott Library, University of Alberta, Edmonton, Alberta
- Université Laval, Quebec City, Quebec

Finland
- Lapland University Consortium Library, Arctic Centre, Rovaniemi
- Oulu University Library, Oulu

Germany
- Alfred Wegener Institute, Helmholtz Centre for Polar & Marine Research, Bremerhaven

United Kingdom
- British Antarctic Survey, Cambridge
- Scott Polar Research Institute, Cambridge

USA
- American Geosciences Institute, Alexandria, Virginia
- Byrd Polar Research Center, The Ohio State University, Columbus
- Elmer E. Rasmuson Library, University of Alaska Fairbanks
  - Alaska & Polar Regions Collections
  - Alaska Film Archives
  - Oral History Program
- Institute of Arctic & Alpine Research, University of Colorado Boulder
- Keith B. Mather Library, Geophysical Institute, University of Alaska Fairbanks
- Roger G. Barry Archives & Resource Center, National Snow & Ice Data Center, University of Colorado Boulder
- Owen Science & Engineering Library, Washington State University, Pullman
- Tuzzy Consortium Library, Barrow, Alaska
- UAA/APU Consortium Library, University of Alaska Anchorage

GROUP PHOTOGRAPH

KEYNOTE

History of Polar Information Science

Marvin Falk, Professor Emeritus, Arctic Bibliographer, Rasmuson Library, University of Alaska Fairbanks, USA

The Northern (now Polar) Libraries Colloquy first met in 1971. Having prospered for 45 years, it has served as a venue for the exchange of ideas and information for librarians with polar interests for a good three professional generations. Most of the founders were already in mid-career at the creation. Those that followed are now almost all retired and the third generation carries the torch. I regret not being able to have attended more Colloquies. My first was in Fairbanks in 1976 when Paul McCarthy [former UAF Library Director] and I were the program committee. I have also been to Paris (1978), Edmonton and Whitehorse (1980), Tromsø (1982), Boulder (1988), Cambridge (1994), and Anchorage (1996). That Colloquy in Anchorage was 20 years ago!

I want to start even earlier than the founding to discuss some of the dynamics of polar information over the past 70 years, the world of polar information following World War II. A huge topic best approached by limiting the discussion to a few conceptual issues with examples.

Paper Islands

The first concept is the library or documentation center as a "paper island." Printed information supported researchers with physical access to the resources available at that particular location. Each research center or educational institution needed its own island. This might even mean multiple small islands (departmental libraries) within a larger institution such as a university.

Each island needed some means of organizing its information, traditionally in the form of a card catalog. Each island with its own catalog — coordinated or not with a larger entity, but involving personnel to maintain the files — maybe just some clerical time, maybe full-time

professional librarians. Considering these islands as a whole, there was an immense amount of duplication of labor to house and process these discrete physical collections.

There has been a crying need to pull knowledge together, beyond the limits of one library. The very large libraries could provide the illusion of a complete universe of published knowledge: think the Bodleian, the British Library, the Harvard libraries, New York Public, or the Library of Congress. Within these great libraries you could find full runs of important serials, books in all of the major European languages, and rooms full of reference works. Serious library research would have been difficult without access to these centers. Then too, resources were not available to duplicate these great libraries in every region. Specialization became mandatory based on local needs. General library reference works did not cover the specialized information needs of polar specialists.

Printed Bibliographies

The second concept is acquiring information through shared cataloging and published bibliographies. When I arrived at the Rasmuson Library, the National Union Catalog (NUC) published for the Library of Congress was the mother of all such tools. When combined with ongoing LC card services, it was the chief authority for our own cataloging. When finished it reached 754 volumes, weighed 3 tons, and took up a lot of shelf space. It was the primary tool for our interlibrary loan requests. We would see who held the item we needed and started writing letters. Now the NUC is barely used at all and many libraries, including ours, have weeded it from our collection. However, about 25% of its citations still are not in online catalogs, such as WorldCat.

Publications Unique to the Polar World

The third concept addresses the question: What about all the specialized publications that we need that are not in the large bibliographic systems? "Grey literature" has bedeviled polar librarians for decades. Here is where special libraries and bibliographic control by specialists becomes essential to polar research support. Several major initiatives were developed over the years to get catalog entries for this material into the emerging bibliographic utilities. As producers of grey literature and the library systems have moved to control it, grey literature has faded as an emergency for librarians.

Money

During the first decades following Alaskan statehood, there was a flurry of new spending to create a modern state from the institution-poor Territory of Alaska. One of the most powerful legislators at the time was Bill Ray, popularly known as S.O.B. (which he said stood for Sweet Old Bill). His favorite cliché, the Golden Rule, was "he who has the gold makes the rules." In our case, she who has the gold creates the database or the bibliographic utility. He who has no gold closes shop or shrinks.

In my own field, history, things moved slowly up until the late 1970s. Bancroft's *History of Alaska* published in 1886 was still considered the authority for early Alaska. Wickersham's *A Bibliography of Alaskan Literature, 1724–1924,* published in 1927 was the best guide for that era available (actually in several ways, it still is). Someone working on a serious Alaska project would likely need to travel to the regional National Archives depository in Sand Point, visit the Suzzallo Library at the University of Washington, check in at the Bancroft in Berkeley, and go looking at the Library of Congress and other repositories in Washington, DC. Alaska has always been book poor. All the books in all the libraries in Alaska still number fewer than the holdings of any one of America's larger universities.

A system to document publications and to share that knowledge was desperately needed.

AINA

The interest in Arctic information by a number of Canadian and US scientists and military officers during the Second World War led to the creation of the Arctic Institute of North America (AINA). The Institute was established by an act of the Canadian Parliament in December 1945. Montreal became the headquarters with other offices in New York in 1948, Washington, DC in 1951, with satellite offices at Johns Hopkins University and in Ottawa. Canadian and US funding included support on a sustained basis from the US Office of Naval Research. The US National Science Foundation lent support on a project-by-project basis. AINA conducted a number of scientific research projects, but they are outside our consideration here. The AINA library was established, the journal *Arctic* was launched, and in 1947 the AINA *Arctic Bibliography* project was initiated.

The bibliography was designed to provide universal access to Arctic information. The outstanding Canadian bibliographer, Marie Tremaine, was appointed to head the project. It was based in the Library of Congress in Washington, DC. By project end the 15 published volumes (1953–1975) contained well over 100,000 citations to books and articles published in 40 languages — all with English abstracts. Reflecting the realities of Arctic research, over 50% in the later volumes were Russian. A monumental printed work, it is among the best regional bibliographies ever published.

However, the *Arctic Bibliography* was a paper product in a world that was becoming increasingly impatient with the pace of paper publications. Besides, it was difficult to search. Volume three had the index for volumes one and two. Thereafter each volume had its own index. Users were demanding more immediate access to current research rather than wait for a printed volume. Never mind that the indexing itself was masterful. Marie Tremaine herself retired following the publication of volume 14. An effort to utilize computer files for the unpublished 16th volume was unsuccessful due to software failure. The US military did not renew its funding and the project came to an end. The AINA library moved to Calgary.

Other paper publications appeared to satisfy some of the same demands, at least for retrospective searches. The card catalogs of major polar libraries were photocopied and published as books. Two prime examples: the Scott Polar Library catalog (19 volumes published in 1976 with a 5 vol. supplement in 1981); and the *Antarctic Bibliography* published by the Library of Congress, 1951–1995 (23 vols.). The data contained in these paper publications would have a later life in digital format.

There were other large programs documenting cold regions research, well covered by Martha Andrews.[1]

Print on Film

Microforms served as an interim print format for both bibliographic information and for subject content. Printed sources such as newspapers have long been microfilmed. For a time, microfiche was an alternative for various special collections and catalogs. For example, a microfiche catalog was used as a transition from the printed card stock at the Rasmuson library. Fiche was generated from computer files and easily updated. Fiche content was

easily duplicated and distributed. A number of collections on microfiche were created for content distribution. "Photofiche" were used to distribute thumbnail reproductions of historical photographs in Alaska. Computer screens were not yet up to displaying complex graphics in digital format and there was not yet an internet.

Data Machines vs. Typed Cards

Machines have been used to store and manipulate data since the late 19th century. The Hollerith Machine was used for the 1890 US Census. Counters/sorters could tabulate and store large amounts of data entered on punch cards. This technology was still in use up through the early 1970s. By that time, key punch cards, paper tapes, and magnetic tapes became storage and input media for computers which were way more flexible and powerful than the old counters.

Librarians started experimenting with computers in earnest in the 1950s. The assault on card catalogs for large collections was on. Manual card catalogs for very large collections were becoming nearly impossible to manage. The Library of Congress had millions upon millions of individual cards to manage. An oft-quoted example is how LC delayed changing "The Great War" to "World War One," which would involve many, many thousands of cards. Not just subject cards, but all cards for each entry that referenced the subject term.

Serials were a nightmare. For example, Russian scientific and scholarly publications were routinely issued by the Academy of Science with its myriad subdivisions and regional entities. After the Revolution, during the Soviet era, there was much reorganization and renaming of institutes. The Library of Congress placed publications issued by a newly re-branded entity under the old Tsarist terms. The complexity of cleaning this all up under a card system would be daunting indeed.

The first widely distributed computer-created polar databases were issued on paper or microfiche — for example Nita Cooke's *Boreal.*

The way out was to employ computer-based bibliographic utilities. Access was first through computer-created media such as a CD or in-house servers and then remotely through communication systems. Access to the first online systems was available through direct

connection over phone lines. Much of the access was through for-profit venders, and still is. If a library subscribes, their patrons have access. Much is now freely available across the internet. However, someone has to pay to create the files and maintain connectivity.

ASTIS

When Ross Goodwin first released his ASTIS system (Arctic Science and Technology Information System), I was truly impressed. It was well designed and technically well ahead of anything else available at the time. I thought, here is a chance for some meaningful collaboration. If we could merge our data, such as our *Bibliography of Alaskana* with his, we would all be better off. I talked with Ross; I talked to a number of librarians in Alaska; I talked with our own library administration. Sorry to say, governance and legal issues made it impossible to proceed at that time. S.O.B.'s Golden Rule applied here. For some time, Ross was funded by the Canadian petroleum industry to enter the information that they needed. Lacking support for other subject matter, the database became primarily regional. Many more areas of knowledge have been added since then, and that system continues as the prime polar bibliographic resource for Canada.

Wenger

An example of the limits of paper systems is the experience of Hubert Wenger in France (and later Switzerland). As a young man, he hid out at his grandmother's house during much of the Second World War. Young men like him were in demand by both the German occupiers and the French Resistance. His grandmother had a substantial collection of books on the Arctic, and he became fascinated by the subject of Eskimos. Following the Normandy invasion, he did join the military for the remainder of the war. After some life events, including his marriage to Beatrice, whom he met while an exchange student in Holland, he made his study of Eskimos a serious hobby and a quest.

He felt that the best record of Eskimo life would be descriptions made by outsiders who first encountered them. These first contacts happened at widely different times, depending upon when explorers, hunters, or missionaries first arrived at a particular location. He wanted to bring records of their encounters together so that they could be shared, not least by the Eskimos themselves.

I first met Hubert and Beatrice at the Northern Libraries Colloquy in Paris in 1978. He had recently visited a computer exhibition in Paris and was convinced that a computer would provide a solution. The computers were so physically large that he would have had to build an addition to his house for it. Luckily, he discovered the IBM Selectric typewriter with memory. He started typing in his texts, but soon discovered its limitations in terms of storage and its ability to function as a database. Besides, personally typing in selections from books was not only tedious, but also slow.

On one of his trips to Fairbanks, he asked if we could create a database based upon his ideas. I said yes, and the project using optical character recognition of scanned text loaded into a searchable database soon began, with the blessing of the library administration. The Golden Rule here involved the substantial personal financial support of Hubert and Beatrice Wenger.

Do Printed Bibliographies Have a Future?

In the early 1990s I compiled a general bibliography of books on Alaska for the Clio Press.[2] The exercise led me to think about the divide between available general information and research-grade material. The bibliography was limited to a selection of about 800 books in English on all subjects available in large general libraries outside of Alaska — say a public library in Chicago. It was a guide for readers, and not a tool for serious scholars. Perhaps guides will still have a future. Later, I compiled a more complete bibliography limited to Alaska history for Praeger.[3] I became convinced that the era of economic viability of printed bibliographies supporting research was coming to an end. This, despite the fact that an internet search will only bring a portion of the citations of a well-constructed scholarly bibliography.

The history of the variety of formats and systems put in place by polar libraries to satisfy the information needs of scientists, scholars, students, and the general public has changed along with the development of information technology and the changing information systems available to the end users.

I would argue that today most researchers need electronic source material more than they need access to paper. Research centers serving scientists and scholars are important for the access they provide through subscriptions to and acquisition of online resources. Access can

be gained from the office or even from home. No need to spend days at a library. That is, unless the material is even now only available on paper. More and more scientific resources are "born digital," while historians still need paper, despite digitization projects. Even for them, primary documentation is ever more digital. Who writes hand-written letters anymore in the age of email?

I used to ask my Northern Studies students in the late 1990s to compare what they could find on a particular historical subject in one of the published catalogs, such as the *Dictionary Catalog of the Stefansson Collection on the Polar Regions in the Dartmouth College Library.* Then I asked them to search the internet in general and specialized databases in particular. We found that for many topics, the internet search yielded only 1/3 of the results found in the printed catalog. While the databases now online may have more hits than then, I still believe that the old, seemingly out-of-date, paper reference works still are relevant to a serious researcher. I also found that you almost have to (brow) beat students to get them to make use of microfilm and microfiche. I have served as a judge for public school history contests where students are required to submit a bibliography with their project. Their sources are almost exclusively limited to websites, with almost no printed articles or books. Printed books are fading even in an era when more titles are published every year than ever before.

In my mind, the greatest function of specialized polar libraries is in the expertise of the staff in designing literature research strategies and in managing access. A really good reference librarian is an institutional treasure.

During my 41 years working with Arctic library resources, I have had the privilege to work with colleagues who are a part of the Colloquy community. Phyllis DeMuth and Kay Shelton at the Alaska State Library, Barbara Sokolov at AEIDC in Anchorage, Garth Graham in Whitehorse, Nita Cooke in Edmonton, our UAF Rasmuson Library staff, and especially a sabbatical year at the Scott Polar Research Institute in 1980/81 working with Terrence Armstrong and Harry King.

References and Notes

1. At the 1988 Colloquy in Boulder, Martha Andrews presented a thoroughly documented paper entitled "The Organization of Polar Information Before the Advent of Online Databases: A Review of the Literature." *Glaciological Data (Northern Libraries Colloquy)* 1988, pp. 289–396.

2. *Alaska.* Oxford and Santa Barbara: Clio Press, 1995. (World Bibliographical Series, vol. 183).

3. *Alaska History: An Annotated Bibliography.* Westport, CT: Praeger, 2006. (Bibliographies of the States of the United States series).

PAPERS

Working in Antarctica: Mapping a Changing Experience through the British Antarctic Survey Archives

Bev Ager, British Antarctic Survey, Cambridge, UK

Introduction

The British Antarctic Survey (BAS) is one of the longest-running national Antarctic operators, having had a continual presence in Antarctica since 1943 with its origins in Operation Tabarin, a secret World War II mission. Although formed after the Heroic Age of Exploration, key figures from that era were influential in its creation and driving its direction. Over time, the Survey has evolved into a modern polar research organisation and the "Antarctic culture" — the lived experience of personnel living and working on BAS stations and ships — has undergone significant change. This paper looks at examples of how the BAS Archives can be used to research the changes in organisational culture that impact on working life in Antarctica and the driving forces behind them. As well as reflecting a changing political climate and shifting emphasis in research, exploring the archival collections reveals the impact of social and cultural changes, such as the removal of sled dogs in 1994.

Unpublished memoirs and oral histories in particular are a valuable source of insight into the personal experiences of those working in Polar Regions. A key area of current research includes gender roles — historically, the Antarctic was a strictly male preserve and slow to change. The Archives chart the changing attitudes to women's roles, accounts of their experiences, challenges faced, and landmarks reached — from the first woman to over-winter at a UK research station in 1993 to the Survey's first female director in 2013.

Mapping Change Using Archival Collections

Topographic survey using pre-satellite methods. Surveyor Derek Searle, 1956, Gendarme Bay, Horseshoe Island. (Archives ref: AD6/19/2/Y4/3)

Taking mapping at its most literal, the image above is an illustrative example of how the Archives collection can be used to demonstrate change on a number of levels. At its most basic, there are changes in technology and fieldwork methods, contrasting plane-tabling techniques by a surveyor in the field with modern-day remote methods of mapping using GIS software and satellite imagery. It also reflects changes in where science is being carried out; the base at Horseshoe Island was closed in 1969 — and changes in name — "Gendarme Bay" as a place name is no longer used. Historical maps within the BAS Archives can show change over time, such as seasonal increases and decreases in sea ice extent, or topographical change, depicting features that no longer exist, such as a collapsed ice shelf.

The focus of scientific programmes has also changed since the time this photograph was taken, when the emphasis was on geology and survey. In 1956, under Acting Director — and geologist — Sir Raymond Priestley, the Survey's first scientific unit — Geology — was established. This period approaching the International Geophysical Year (IGY) 1957–59 represented a peak in geological field surveys. It also indicates the key role of the director in influencing the strategic direction of the organisation, driving, or potentially, inhibiting change.

A single point of continuity resides in the ongoing use of the term "Survey" in the organisational name. Post–war, Tabarin had become the Falkland Islands Dependencies

Survey (FIDS) until 1962 when the British Antarctic Survey was formed. Registry files in the Archives show that in 1975, then Director, Dr. Richard Laws, raised the idea of name change, feeling "Survey" to be misleading, of less relevance to organisational activities. Laws was keen to promote BAS's image as a modern scientific organisation. Potential suggestions, including the Institute of British Antarctic Sciences or British Antarctic Sciences Institute, were, however, rejected by BAS's parent body. Perhaps an indication of the influence of external drivers on organisational identity.

The Catalogue as a Tool for Charting Change

If an archival item, such as a photograph, can provide a narrative of change, the catalogue is a key tool in its discovery. The BAS Archives database, which was set-up over 30 years ago, has a remarkably high level of consistency in terms of data entry and field usage. Particularly, this is apparent in the use of key fields, such as subject or discipline keywords, record creation dates, people names, location, or place names. These fields are shown in the example below, which is the catalogue entry for the previous image.

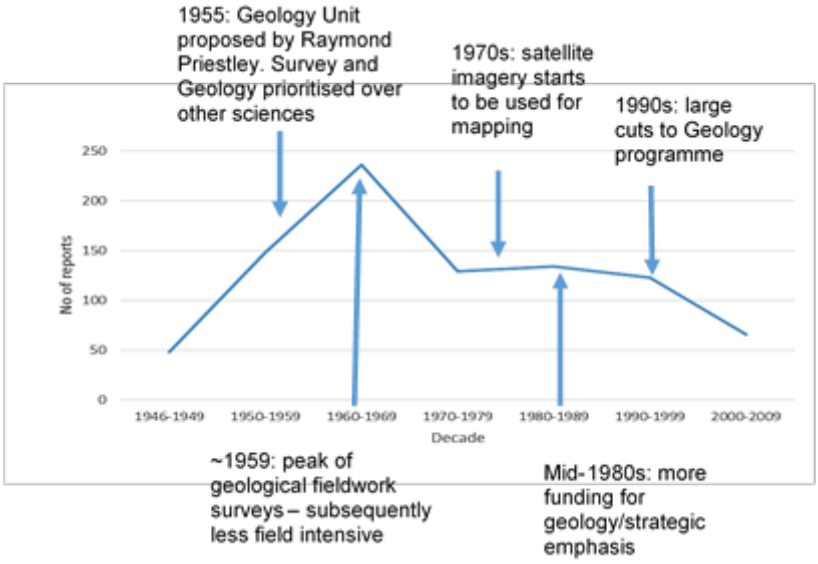
British Antarctic Survey Archives database entry

Identity code	AD6/19/2/Y4/3
Description level	4
Previous number	Y.4.3
Record creation	
Person	
Role	Photographer
Name	Ryan, Francis Bernard (meteorologist)
Date	11.1956
Place	
Region name	Fallières Coast
Locality name	Horseshoe Island Station
Document form	
Record type	Photograph
Specific type	Negative & Print
Free field	Subject category
Type3	Scientific activity
Title	D. Searle surveying on E. side of 'Gendarme Bay', Horseshoe Island.
Note	original list title
Content	
Summary	Shows man surveying with sea and mountains in distance
Person	
Role	Subject of photograph
Name	Searle, Derek John H. (surveyor)
Place	
Region name	Fallières Coast
Locality name	Horseshoe Island & Sally Cove
Locality name	Gendarme Bay (now Sally Cove)
Subject keywords	Topographical survey, plane tabling

Example of a record from the BAS Archives database (July 2016).

This consistency can potentially be used as a means of revealing change markers. Taking, for example, the Base and Field reports series. This long-running series of internal reports goes back over 70 years and contains some of the most heavily used material in the BAS Archives. The database lists over 9,000 catalogue entries in this series, with relatively stable levels of deposit up until ~2000, after which there was a reduction in reports written. Reports were compiled every field season for each base, covering base activities, including logistics, building work, vehicle maintenance, as well as field work, sledging trips, and scientific work by discipline. They were often used to make recommendations for the next field season, so can be used to track improvements to working practices — for example, a mechanic's report on safety modifications required for muskeg tractors. Significant changes may be recorded in the catalogue entry, or require drilling down into the narrative of the material. Carrying out database searches of place names by dates is a relatively simple means of tracking changes in locations where fieldwork is carried out. The reliability and completeness of data entry means that the absence of data can be revealing. For example, it was recently used as a means of searching for pristine environments where BAS has never carried out fieldwork.

The graph below was produced using the Base and Field reports series as a level of continuity to establish, very crudely, whether the database could be used to extract trends on what science is being carried out. Repeating the example of geology, searches were made for reports with "geology" as its subject keyword over seven decades of records. The number of results indicate the level of output and can be used as a proxy for the profile of the discipline within the organisation.



Graph showing number of geology reports produced by decade (July 2016).

From the graph produced, peaks could be roughly mapped to points when there is known to be a strategic emphasis placed on Geology. Similarly, the troughs roughly correspond to periods of decline and funding cuts. For example, there is rapid increase initially when Geology has a lot of traction and support, reaching an apex at around the time of IGY 1957–59. Financial pressures during the late 1970s could appear to equate to a plateau in output. This is followed by government support and funding in the 1980s, as surveying work assumed greater strategic importance. Finally, massive cuts to the Geology programme in the 1990s are signalled by a marked drop-off at the end of the graph. Although, as mentioned, the graph is rudimentary, it demonstrates potential for using the database to track policy and decision-making.

Mapping Cultural Change Through the Archives

"The BAS Archives embody BAS's memory of its own past, and therefore both the types of records preserved and narratives they suggest reflect the subjectivities of the institution's own history" (Morgan Seag, 2015).

The quote above comes from the dissertation of a researcher using the Archive collections at BAS to investigate gender and institutional change at the organisation. It indicates that the elements of organisational history that are chosen to be preserved are reflective of how BAS

chooses to define its identity. Also, as indicated by Seag, the creation of the BAS Archives in 1979, comes at a point when the Survey has been established long enough to have a sense of its own heritage and attach value to it. There are also pragmatic considerations in preserving intellectual assets and preventing data and information loss — the BAS Archives were formed following a period of upheaval following the consolidation of the organisation from scattered science units onto one site. The archival construct is therefore a reflection of BAS history — built to fulfil a dual organisational and scientific purpose, shaped by its various requirements, constraints, and limitations.

Using the recent research example of women in Antarctica, there is a diversity in holdings and material type that document change from both the official and unofficial perspective. Official records include papers from the Administrative series, internal Base and Field Reports, published annual reports, minutes from the Director's Committee, and the Women in the Antarctic Working Group. Again, the role of director is key, with Dr. David Drewry, BAS Director from 1987–1994, influential in promoting the employment of women in roles involving fieldwork. Equally, external drivers, such as legislation on gender equality, acted to increase external accountability. From the unofficial records, the personal stories emerge, and are a source of valuable insight into the lived experience, including informal photos of base life, magazines and diaries written by base personnel, unpublished memoirs, and oral history interviews. The latter are generally recorded after staff leave BAS, creating a distance from the events described, enabling a more reflective, less constrained response. Both the unofficial and official record have limitations — opinion can distort fact, memory can be inaccurate in recall; official records disproportionately reflect the views of a small decision-making group. Combined, they provide intriguing insight into attitudes to change, exposing internal resistance to change, and fears of its impact on the Antarctic working environment and culture.

Using the Catalogue as a Research Tool

Continuing the theme of changing attitudes to gender equality and how well it is reflected by the archival collection, it becomes apparent that relevant material may be "hidden" within the catalogue. Depending on how it has been interpreted and classified by the cataloguer, it may

require more in-depth searching to find relevant material to describe the narrative of change. The function of the catalogue is primarily extracting scientific data and information. Approaching from a social history perspective requires some understanding of the type of content within different series, as well as consideration of terms used to classify material. Although gender is a key research theme, it is not actually used as an index term, which in itself is of significance. Free-text searching for "gender" yields only four hits in a database of nearly 37,459 records. A list of some of the most relevant index terms by number of hits is provided in the table below.

Index terms	Hits
Women, Antarctic service, B.A.S.	48
Personnel, women, in Antarctica	8
Women, South Georgia	8
Personnel, recruitment, women	6
Women, Antarctic service, F.I.D.S.	6
Women visitors, first, Port Lockroy Station	5
Sex Discrimination Act	5
Personnel, women, F.I.D.S., Headquarters	2
Women visitors, first, Antarctica	2
Women, Signy Station	2
Personnel, equal opportunities legislation, women	1

List of index terms related to women in Antarctica (July 2016).

A preliminary search using subject index terms that include the term "women" gets 84 hits or roughly 0.2% of total records, with free-text searching gaining about 91 hits. This doesn't necessarily indicate that there isn't a lot more material that has relevance and interest from a gender perspective, but that it's not necessarily so easy to locate or categorise as gender-

related. Also, the key female scientists who played pivotal roles during the 1980s would not necessarily want scientific accomplishment to be redefined by gender. Interviews with female scientists from the late 1990s onwards suggest there isn't the same perception of gender as an issue impacting on their experience of working in Antarctica. The usage of key index terms is also time specific with the majority of results relating to the 1980s and 1990s when there is a peak in activity to promote equality and policy change, then trails off when its main objective is achieved.

In terms of representation of gender within the Archive, a very basic search of names within the database by gender reveals a roughly 8:1 male to female ratio. Out of over 300 interviews within the Oral History series, there are only ten with female interviewees. Interesting by its absence are interviews with office staff working in administrative and secretarial roles, which would be highly insightful into the working culture of the organisation from a non-science perspective.

Conclusion

To conclude, there is an underlying consistency and continuity in the Archive catalogue and records collected that are a valuable tool for tracking change. Exploring the collections opens up multiple avenues of research relating to change and its impact. Although the isolation of the Antarctic workplace can insulate it from change, adaptation and innovation are essential to successfully meeting its unique challenges. Change can be incremental, such as improvements to working practices, developments in technology, travel, and communications, making the Antarctic a more accessible, safer, working environment. Other change has a larger, more obvious impact, such as the publication of the ozone hole discovery — an impetus for global change that placed BAS science on the international political agenda.

Organisational change takes place within the wider context of societal and cultural change, shifting political agendas, and variable financial climate. These external drivers impact on operations, influencing decision-making, strategy, and direction. The rich diversity of archival material, both official and unofficial, may have biases and subjectivities, but much can emerge about internal attitudes and responses — whether it's to promote or impede change,

or work to maintain the status quo. This enables an organisational narrative to be created that reveals how the Survey has responded to change previously, which can inform response to future change, and also show what it is important to preserve.

Preserving cultural change: Two sledge dog teams underway, Wally Herbert in foreground, 1956–58, Hope Bay. (Archives ref: AD6/19/2/D391/4)

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Géoindex+: A Geospatial Platform for Northern Historical and Research Data

Stéfano Biondo, Université Laval Bibliothèque, Quebec, Canada
(Translated by Marie-Claude Plourde and Catherine Jalbert)

Abstract

This paper aims to demonstrate the potential of Géoindex+ in hosting and disseminating recent and historical geospatial data relating to the North. These data were taken from cartographic documents in the Université Laval Library's collection and from research data produced by academics from ArcticNet at Université Laval. Géoindex+, a geospatial data discovery, visualization, and extraction platform, is developed by the Centre d'information géographique et statistique (Centre GéoStat) of the Université Laval Library.

The potential of Géoindex+ is shown through two examples. The first one highlights the possibility of giving second life to historical cartographic documents by the digitization, georeferencing, visualization, and dissemination of maps from the Coppermine Expedition, which was led from 1819 to 1822 by the British explorer John Franklin. This expedition aimed at exploring and mapping a part of the Arctic coast of what is now Canada. The second one seeks to demonstrate that Géoindex+ can also host and disseminate recent research data about the North. Northern Studies are a research niche area at Université Laval and they produce voluminous data. Among these are the bathymetric data (submarine topography) gathered from the scientific icebreaker *Amundsen* by the team of Professor Patrick Lajeunesse of the ArcticNet. An agreement with Professor Lajeunesse allows Library users to locate, visualize, and download generalized bathymetric data relating to Canada's northern waters.

Centre GéoStat and Géoindex+

The Centre GéoStat, Centre d'information géographique et statistique, is a department of the Library of Université Laval, located in Québec City, Canada. We identify and review geography books, map statistics, atlases, aerial photographs, and geospatial data. Within the geographic and cartographic collections, there is a subset pertaining to the North or Northern Studies, which corresponds to one of the centres of excellence at Université Laval.

All of this brings us to the two examples when we used Géoindex+ to promote and make available northern geographic information. Although Géoindex+ is not specifically designed to host circumpolar data using a polar projection, the platform allows us to find, view, and retrieve geospatial data, including northern data.

It provides easy access to more than 1250 layers of geospatial data. It was developed by Université Laval's Centre GéoStat in 2012 and is now used in the province of Québec by the University of Montréal and the Université du Québec à Montréal (UQAM) [See Fig. 3].

Coppermine Expedition, 1819–1822

The Coppermine expedition was the first mission conducted in the Canadian Arctic by Sir John Franklin. From the left bank of the Hudson Bay, Franklin led the expedition toward the East and North through Manitoba, Saskatchewan, Alberta, and the Northwest Territories to the Coppermine River and, from there, up to the Arctic Ocean shores in Nunavut. Ill-prepared for the harsh conditions they were to be faced with, only nine of the expedition's original 20 members survived. They were however given a hero's welcome on their return home to England.

The expedition mapped the land route taken by Franklin's men, but also part of the Arctic coasts, which were then new territory. Like his peers, Franklin wanted to contribute to the mapping of the Northwest Passage. It was a scientific expedition that aimed to gather cartographic, geographical, botanical, meteorological, and geological information. Samples of rocks and plants were collected; positions were noted down using the latitude and longitude.

The members of the expedition party were adventurers of various origins, comprised of five British soldiers, many French-Canadian travelers, and some Aboriginals. The narrative of Franklin's Coppermine expedition was published in 1823 under the title, *Narrative of a Journey to the Shores of the Polar Sea,* and is considered one of the greatest Far North travel accounts.

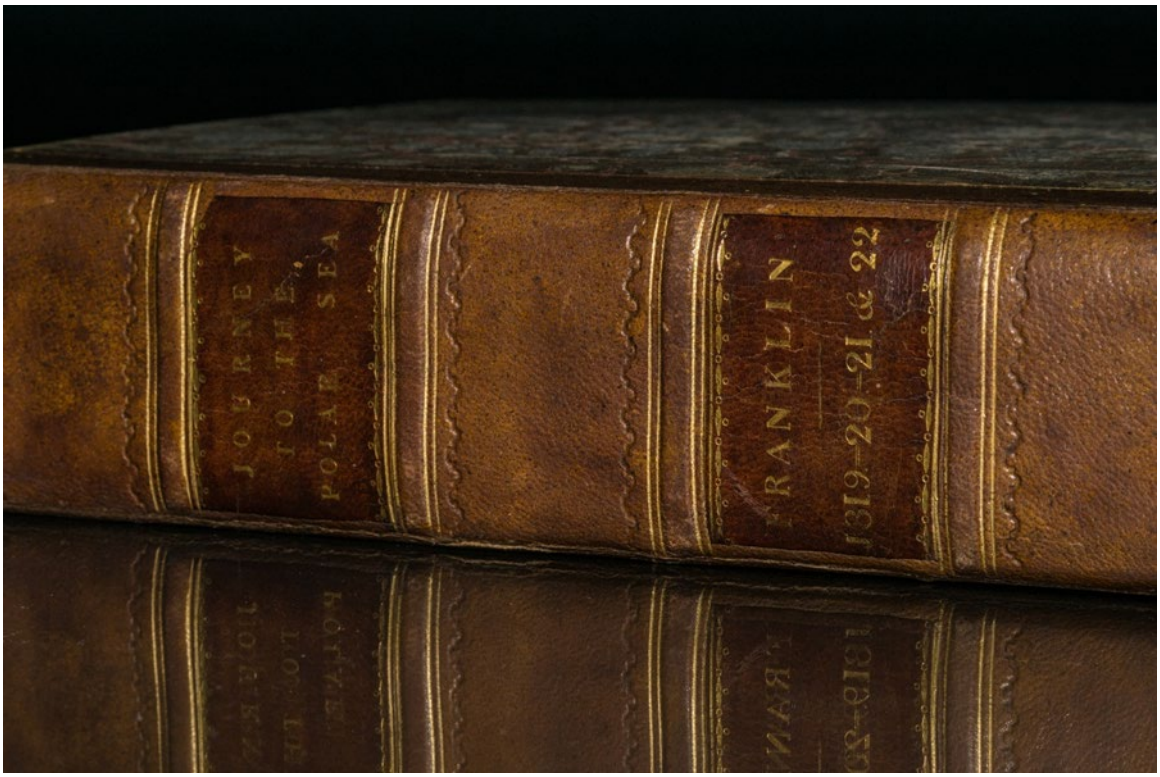

Fig. 1. *Spine of the book,* Narrative of a Journey to the Shores of the Polar Sea, *owned by Université Laval.*

Franklin's travel account is a magnificent book that became a classic of travel literature (or exploration narrative) very soon after its publication [see Fig. 1]. It contains four maps, three of which show the route taken by Franklin's party, and the other one depicting the then new findings of Parry, Ross, and Franklin. It also contains 31 engravings by Robert Hood and George Back, including 11 enhanced colour images [see Fig. 2].

Fig. 2. *A beautiful engraving entitled,* "Manner of Making a Resting Place on a Winter's Night", *drawn by George Back and engraved by Edward Francis Finden.*

To showcase this document and adventure, we digitized, assembled, and georeferenced the maps. We also digitized and geolocalized the engravings, created new data, and added text and attributes. We then disseminated the results through Géoindex+.

Coppermine Expedition, 1819–1822 in Géoindex+

As mentioned, Géoindex+ is a platform that allows users to find and retrieve geospatial data [see Fig. 3].

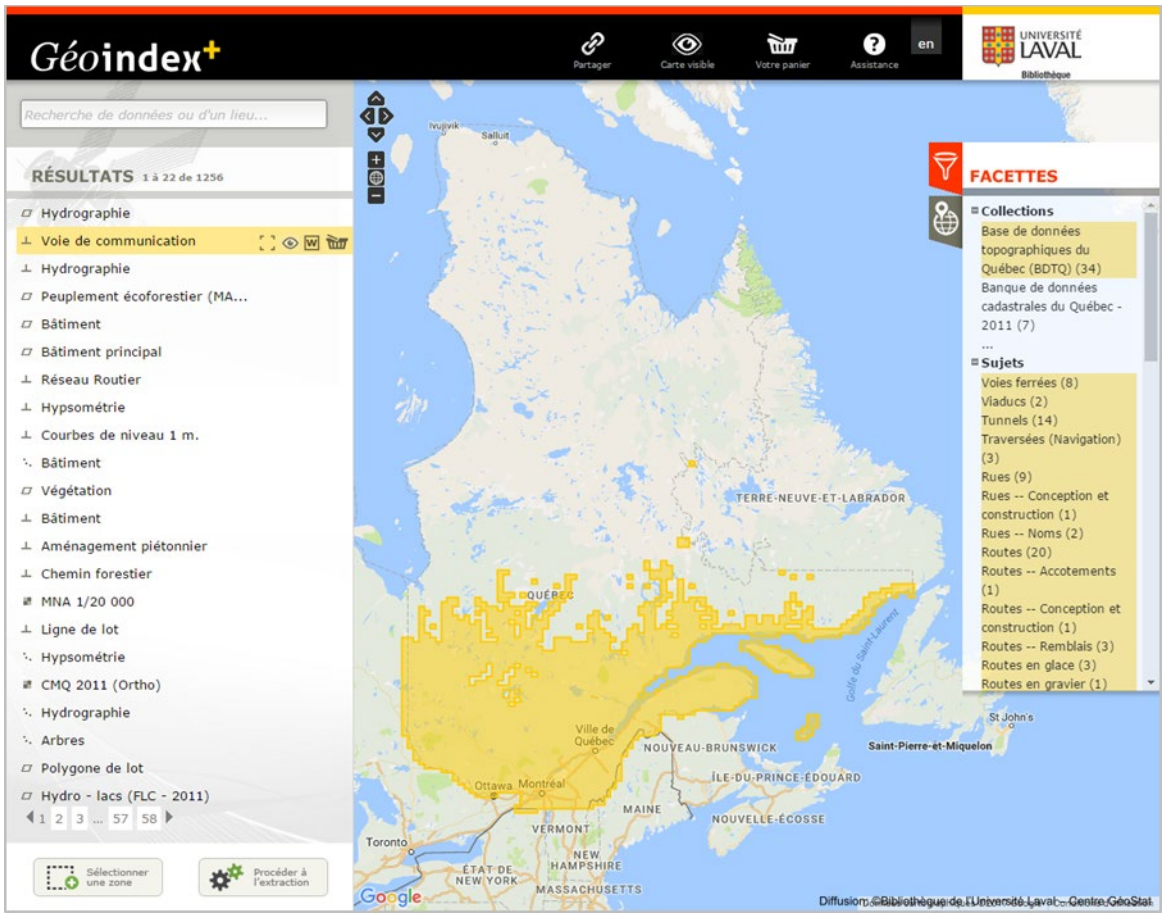

Fig. 3. *Géoindex+, a geospatial data discovery, visualization, and extraction platform.*

There is a basic search box which allows you to search for the metadata and name of a location at the same time. Just below the search box, we find the result area (each result represents a layer of geospatial data). When hovering above a layer, we automatically get the following information:

- The spatial extent of the data that has been mapped;
- The facet (filter) associated with the layer (its collection, subjects, data type, geometry, and so on);
- The associated facets are highlighted and moved to the forefront.

The above is very practical because we can easily obtain important information without opening the metadata record. Below the result area, we find two buttons; the first one allows you to select an area, and the second one lets you extract the selected data. On the right-hand side, you can find the facets allowing us to filter the results. The icon just below the

facet allows us to change the background map and add reference layers. By moving a little to the East, we will notice that for this region we have a different number of layers available. By moving, the number of results will change according to the geographical extent that we see on the screen. With each move, there is a spatial query that is sent to the server.

By entering Coppermine as a subject, the system automatically completes the subject using metadata [see A in Fig. 4]. By clicking on the "eye" icon, we display various layers of data. We can see here the route taken by the expedition [see B in Fig. 4]. With the transparency gradient, we can appreciate the accuracy of the tracking for that time [see C in Fig. 4].

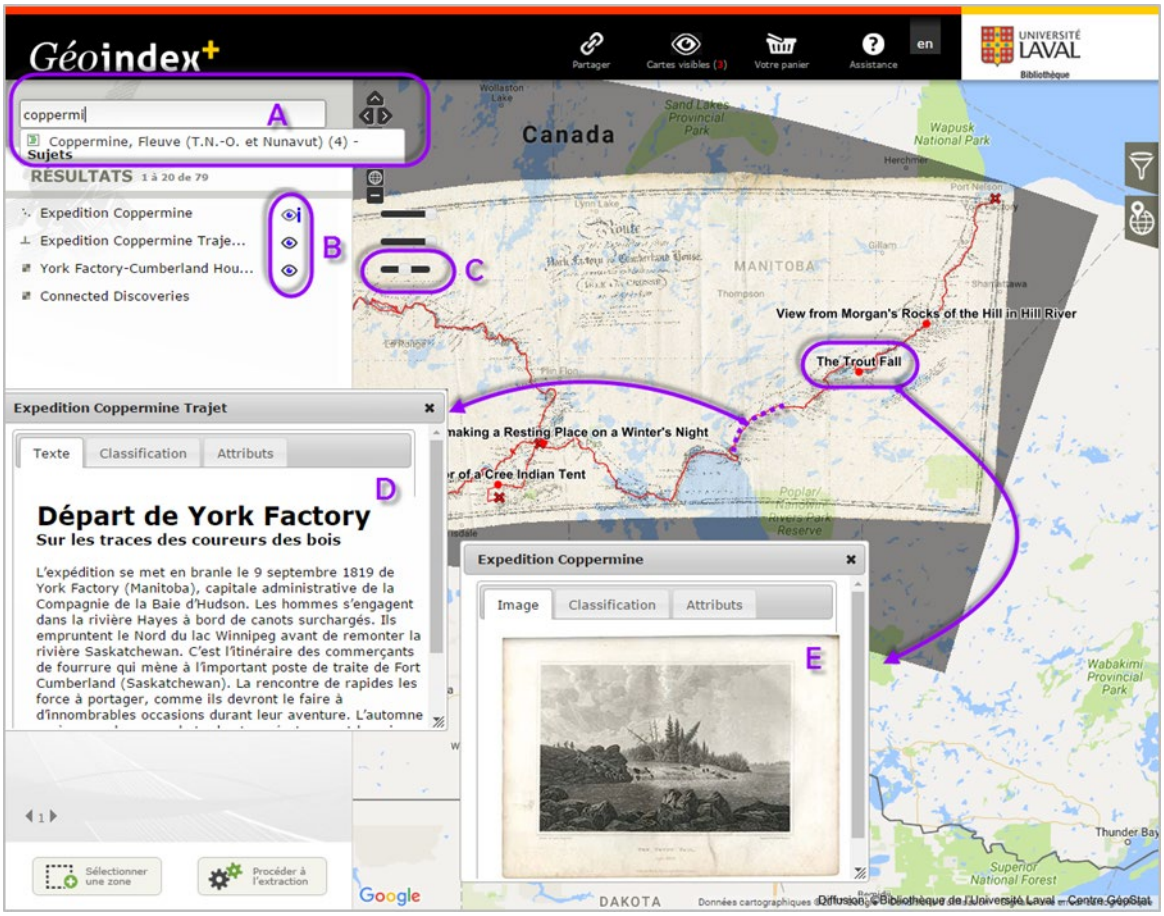

Fig. 4. *Interface functionalities of Géoindex+.*

We can display the expedition route we created from the georeferenced maps (red line). When we click directly on sections of that route, a window opens and displays relevant pieces of information: here, a short text written by my colleague Joë [Bouchard] summarizing this

part of the adventure [see D in Fig. 4]. We can also view the layer attributes: starting point and date, ending point and date, number of kilometres covered in how many days. Each section is delimited by red crosses.

We also created an additional layer that is used to locate the engravings contained in the book. By clicking on one of the red points, we can see a thumbnail of the engraving and view the attributes of that point [see E in Fig. 4]. If we come back to the thumbnail and click on it, we can access a high-resolution image in which it is possible to navigate: we can even explore it down to the smallest detail using the Zoomify program. We have also created metadata for each engraving [see Fig. 5].

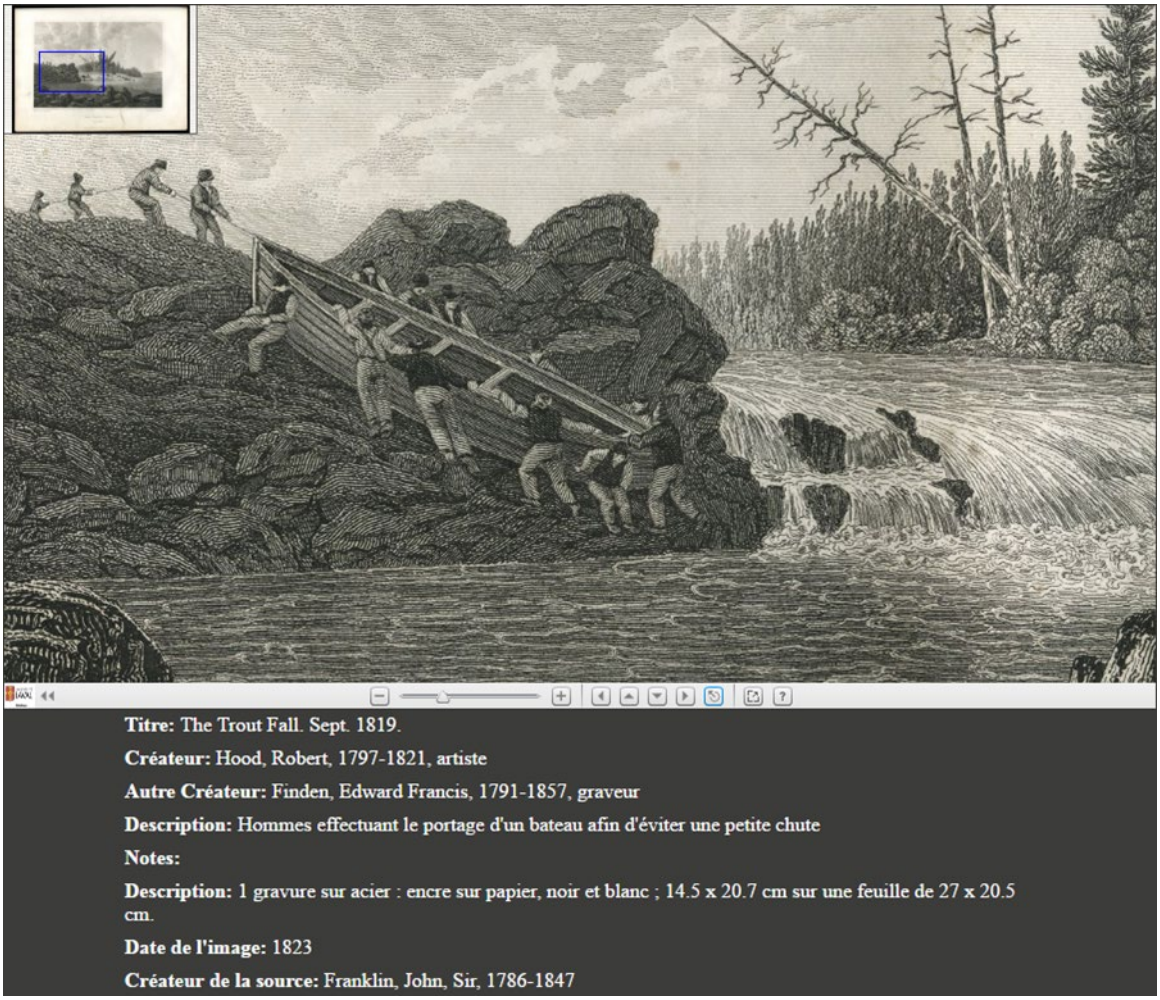

Fig. 5. *High-resolution image accessible by clicking on the thumbnail image in Géoindex+.*

These data layers can be downloaded for use within any Geographical Information System (GIS) software like ArcMap or even Google Earth. With the selection button, we can choose an area of interest, then click on the extraction button. A form opens and we must specify the extraction format and type of projection desired, review the license agreement, and enter our email. We can then easily open and use this data in another medium.

Bathymetric Data from the CCGS *Amundsen*

The second case involves the bathymetric data acquired from research icebreaker *Amundsen,* which provides Canadian researchers and their international collaborators unprecedented access to the Arctic Ocean.

Since 2002, the *Amundsen* has been leading a double life, serving as an icebreaker in the St. Lawrence River and Gulf for part of the year, and as a research vessel in the Arctic and Subarctic for another part of the year, for a period of up to 152 days. The *Amundsen* is equipped with 65 scientific systems and 22 laboratories that meet the needs of researchers from various disciplines, namely sophisticated sonars installed on its hull and used for bathymetric mapping.

A number of research teams and organizations can use the *Amundsen* to conduct scientific expeditions. The ArcticNet network of centres of excellence is one of the most active in this respect, bringing together more than 150 researchers and 1,000 graduate students in natural, human health, and social sciences, along with their partnerships with Inuit organizations, northern communities, federal and provincial agencies, and the private sector to study the impacts of climate change and modernization on Canada's Arctic coast.

Fig. 6. *Centre GéoStat team, from the left: Valérie Arsenault, Documentation Technician; Gaston Quirion, Data Librarian; Marie-Andrée Drouin, Geomatics Technician; Stéfano Biondo, Map and GIS Librarian; Joë Bouchard, Librarian.*

The *Amundsen* is in fact ArcticNet's main marine research platform. The ArcticNet researchers include geography professor Patrick Lajeunesse, who is Project Manager for Canadian Arctic Seafloor Mapping. We are fortunate that Patrick is a professor at Université Laval, since this facilitated the bathymetric data dissemination project and also made it possible for us to visit the *Amundsen* in November 2015!

Bathymetric Data, 2013–2014

To generate the Geotiffs that can be viewed in and downloaded from Géoindex+, we created two layers that we then merged together [see Fig. 7].

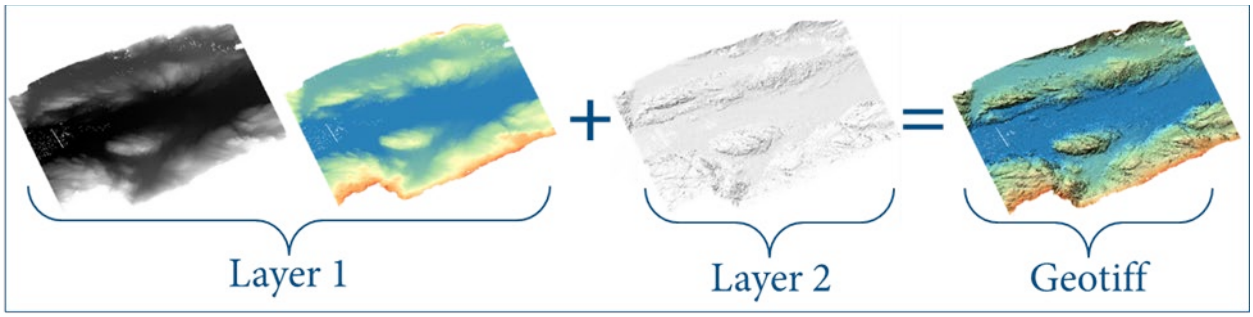

Fig. 7. *Process steps to transform the raw data to a Geotiff.*

Using the original float files — matrices which contain elevation values — we applied a colour gradient with respect to the depth associated with each pixel. From the same float files, we created a hillshade — a pseudo-3D shading matrix based on the orientation (315 deg) and elevation (45 deg) of the "sun" with a 3x vertical exaggeration. Finally, we merged those two layers to create a composite image (RGB) in which the colour-scale layer is applied transparently over the shading layer.

Bathymetric Data in Géoindex+

By entering the term "Amundsen" before hitting Enter, we can retrieve the bathymetric data easily. We can see its spatial extent when we hover over the title of a layer. We can change the background to get more information, for instance, by using the map background from Bing [see A in Fig. 8]. We can also toggle the interface into English [see B in Fig. 8]. When we enter the place name "Baffin Island," the interface takes us to the right location. By clicking on the information icon of the bathymetric layer, we can view unique, exceptional high-precision pictures of the seafloor [see C in Fig. 8].

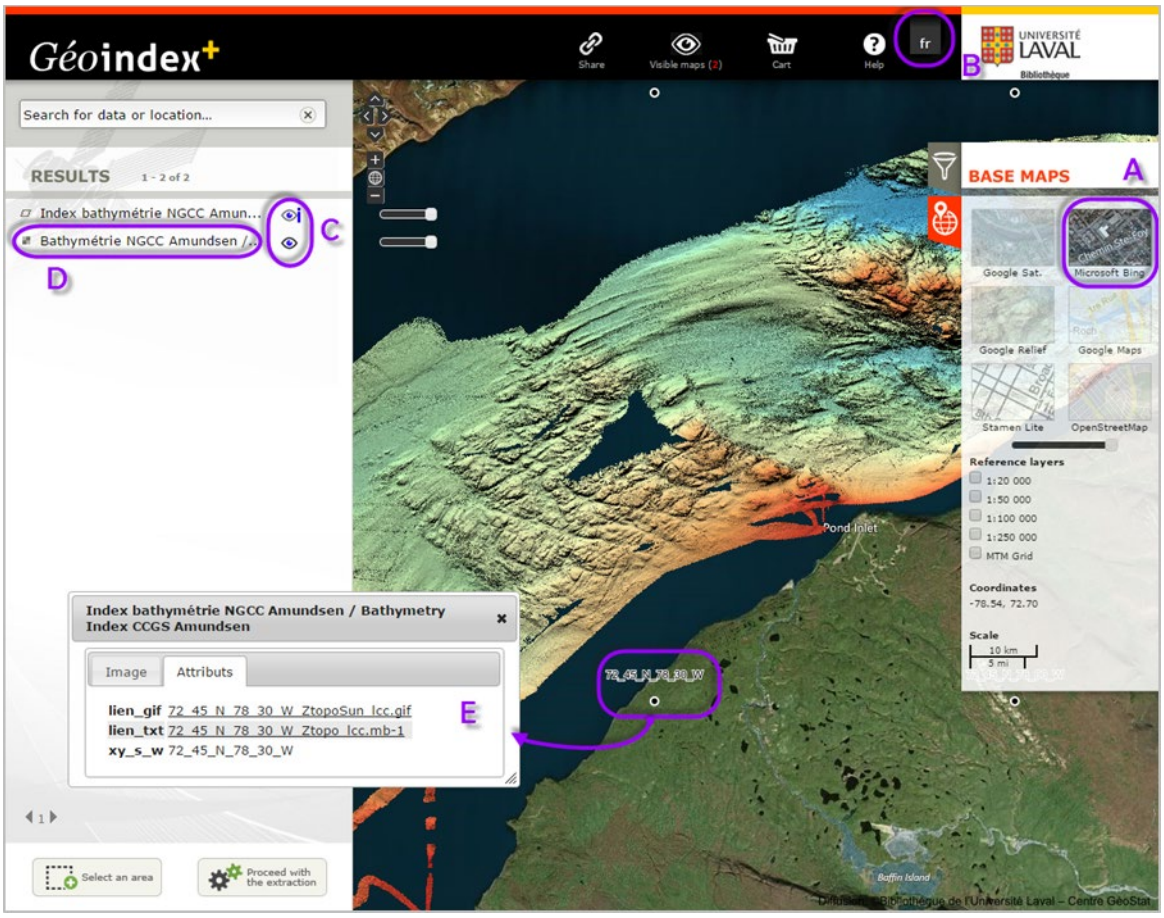

Fig. 8. *Interface functionalities of Géoindex+.*

What we see here are ice paleolandforms left behind by an ice stream that was probably active during the Pleniglacial Age, i.e., 21,000 B.P. These ice streams act like rivers of ice within inlandsis (ice sheets). We can still observe some today in Antarctica. These forms are called mega-scale glacial lineations (MSGL) and create what is called a "bottleneck."

When we click directly on the name of the layer, a window opens that lets us see the metadata, which happens to be bilingual in this case [see D in Fig. 8]. We also added an index layer, from which you can see a JPEG picture of a given section and a text file that lists the periods during which research icebreaker *Amundsen* conducted bathymetric surveys [see E in Fig. 8].

Mapping Change

The two examples presented are directly related to the theme of the conference: Mapping Change. On the one hand, we must create added value to our existing historical collections. We must give them a second life, map them, geolocalize them, let them speak, create new data, and disseminate them. On the other hand, we believe that research data is and will be the data we will need to consider and care about. There will be more and more data coming in with a spatial component, and we must ensure that it is preserved and disseminated. In this context, geoportals, much like institutional repositories, are yet another door enabling us to find, view, and share this data.

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Establishing Criteria for the Development of the "Northern Collection" at Université Laval's Library: An Exploratory Approach

Joë Bouchard, Université Laval Bibliothèque, Quebec, Canada
(Translated by Marie-Claude Plourde)

Introduction

In July 2014, I had the pleasure of attending the Polar Libraries Colloquy, where I presented the "Mercator Project."[1] This initiative, led by Université Laval's Library, has made it possible to purchase and showcase an original copy of the first printed map of the Arctic. As I explained then, this project was part of a broader program aimed at identifying and selecting founding documentary sources in the field of Northern Studies and that would require a certain amount of work over the years to follow.

And here we are now, two years later, gathered together again at the PLC. So, what exactly did we work on in the past two years? We have been able to acquire a few very old documents pertaining to the North, although only in very limited numbers due to cuts to our acquisition budget. The main idea is still the same: developing and highlighting a special collection made up of rare documents that are significant for the development of our scientific knowledge of the North. But, before being able to begin work on the structured development of this collection, we must think carefully about the criteria we will use to identify founding documentary sources. Using the explanatory approach set forth in this document, I will be discussing the criteria we are considering using; this will give you some insight into the nature of the collection we want to develop and provide you with examples of the documentary sources we would select using them.

Why Northern Studies?

Historically, Northern Studies have occupied a prominent place in both education and research at Université Laval and is one of our institution's major centres of excellence. However, this situation is clearly not reflected in our Library's collections, which has over six million titles. While recent literature on Northern Studies is being acquired by various librarians, there exists no collection development policy specific to this field. Moreover, we found that although our collections already comprised several early works of some interest in

terms of a historical geography of the North, these documents were not identified or promoted as such.

Goals and Purposes of the "Northern Collection"

The development of the upcoming "Northern Collection" — a temporary name — therefore seeks to remedy this situation. The project aims to ensure that the major components of the documentary heritage belonging to one of our university's key areas are grouped together and given exposure. In doing this, we hope to offer a striking contextualization of how our knowledge of the North evolved to students and teachers, as well as the many external users with an interest in Northern issues. We indeed hope that the operation will help promote the Library and bring it more exposure outside the university campus.

Identification of Selection Criteria

To date, seven criteria have been established for the selection of documentary sources. They pertain to the geographical location, document types, edition and language, historical period, content, reception, and aesthetic appeal of the works.

1. Geographical Location

The first criterion is the geographical location. To be selected, a document must deal with the northern territory, which, according to the definition from *Le monde circumnordique,* starts at the 50th parallel north.[2] In particular, it may pertain to one or more of three geographical areas: 1) Northern Quebec, including Quebec's Near and Far North; 2) Northern Canada, including Canada's Near and Far North and High Arctic; and 3) the northern part of the globe, if the document addresses the North as a whole. Works dealing with northern regions of Europe or Russia are not targeted, firstly for the sake of realism, since the body of works pertaining to these areas is very large, and secondly because we wish to focus on the Quebec and Canadian identity of our academic institution.

2. Document Types

The following two types of documents are to be prioritized for the development of the "Northern Collection": 1) printed monographs (books, including travel accounts and reports) and 2) printed maps. I should mention that the development of a map collection calls for

special considerations that will be specified in the form of secondary criteria which fall under the responsibility of my colleague, map librarian Stéfano Biondo, and will not be addressed here. As you may have noticed from the repeated mention of the word "printed," we are interested only in works that have been officially published. Numerous handwritten sources that could be of interest to the field are thus excluded.

3. Edition and Language

It is imperative that we try to acquire the works in their first edition, given the rarity associated with these versions. The first edition is preferred on principle because we aim to highlight the original state of a documentary source which has later proved to be a founding reference work and instrumental to our understanding of the North. We also seek to acquire the document in its original language. However, in accordance with our status as a French-language university, the first French edition of the document, should such a version exist, will also be targeted for acquisition.

4. Historical Period

While the beginning of the period covered is rather easy to define, as it corresponds to the advent of printing (circa 1450–1500), it is more difficult to determine where the period should end. Are not discoveries furthering our knowledge of northern geography still being made today? However, for our purposes, we consider the early 1900s to be an important period for discovery and exploration of the northern territory, with the first crossing of the Northwest Passage by Amundsen-West (1906), the claims by both Cook and Peary to be the first at the North Pole (1908–1909), and the last significant addition to Canada's High Arctic by Stefánsson (1916). Documents that chronicle these events could therefore be the last and most recent works included in the collection.

5. Content

The content criterion is of paramount importance. Documents shall be selected if their content significantly contributed to the advancement of knowledge in terms of human geography, physical geography, natural sciences, or mapping of the North. Preference will be given, furthermore, to documents that added to our understanding of the northern world,

from a global and multidisciplinary perspective rather than in a highly specialized way. This last point will lead to the exclusion of many documentary sources.

6. Reception

Works are deemed to be founding if their publication drew a lot of attention from the public, or critics, in their own time. This can be confirmed by researching contemporary periodicals and later analyses published by specialists, as well as using citation impact measures. The publication of many editions over time must also be taken into consideration, as it indicates that a title was well-received.

7. Aesthetic Appeal

A work is not limited solely to its intellectual content; it also has a physical form that may have outstanding features. Moreover, the history of publishing has shown that a book's appearance can play a significant role in its reception by the public and critics. While we clearly do not intend to judge books only by their covers, exceptional physical features will therefore be one of the selection criteria. The document's physical state, format, binding, illustrations, and inclusion of maps are all aspects that may be used to assess its physical advantages.

The Criteria Applied to Three Documentary Sources

Here are three examples of documents that have been selected on the basis of these criteria. They represent three different types of documents and cover the three geographic regions selected for the development of the collection.

Septentrionalium terrarum descriptio, 1595

I will first discuss the case of Gerardus Mercator's map, *Septentrionalium terrarum descriptio,* which I presented to the PLC in 2014. This is the first printed map (criterion 2) in the history of cartography to represent the northern reaches of the globe. The "roof of the world" is depicted in its entirety from the 60th parallel north (criterion 1), using a polar projection that places the North Pole at the centre of the document.

Gerardus Mercator, Septentrionalium terrarum descriptio, *Duisbourg, 1595.*

The original version of this map was published in 1595, which makes it most likely one of the oldest documents in the collection (criterion 4). The original map, of which Université Laval's Library acquired a copy in 2010, was published in Latin. However, we know that a French edition was published in 1613, and we are therefore looking for an original copy of the map in its French version (criterion 3), a difficult feat given the rarity of the document!

The content criterion is also fully satisfied: Mercator generally helped further the state of our knowledge of the North, in terms of both cartography and physical and human geography. He brilliantly summarized several documentary sources by explorers, adventurers, scientists, and cartographer colleagues. Included in his large world atlas, the map was printed in large numbers and widely circulated all over Europe in its day (criterion 6). The map was printed in

many states, editions, and language versions, and has also been extensively discussed in the literature, which enables us to assess the exceptional reception this document enjoyed.

The aesthetic appeal of the polar map is obvious, since it can be classified both as an artistic and a scientific work (criterion 7). Indeed, few documents simultaneously stimulate such intellectual curiosity and evoke such strong aesthetic emotions among our users.

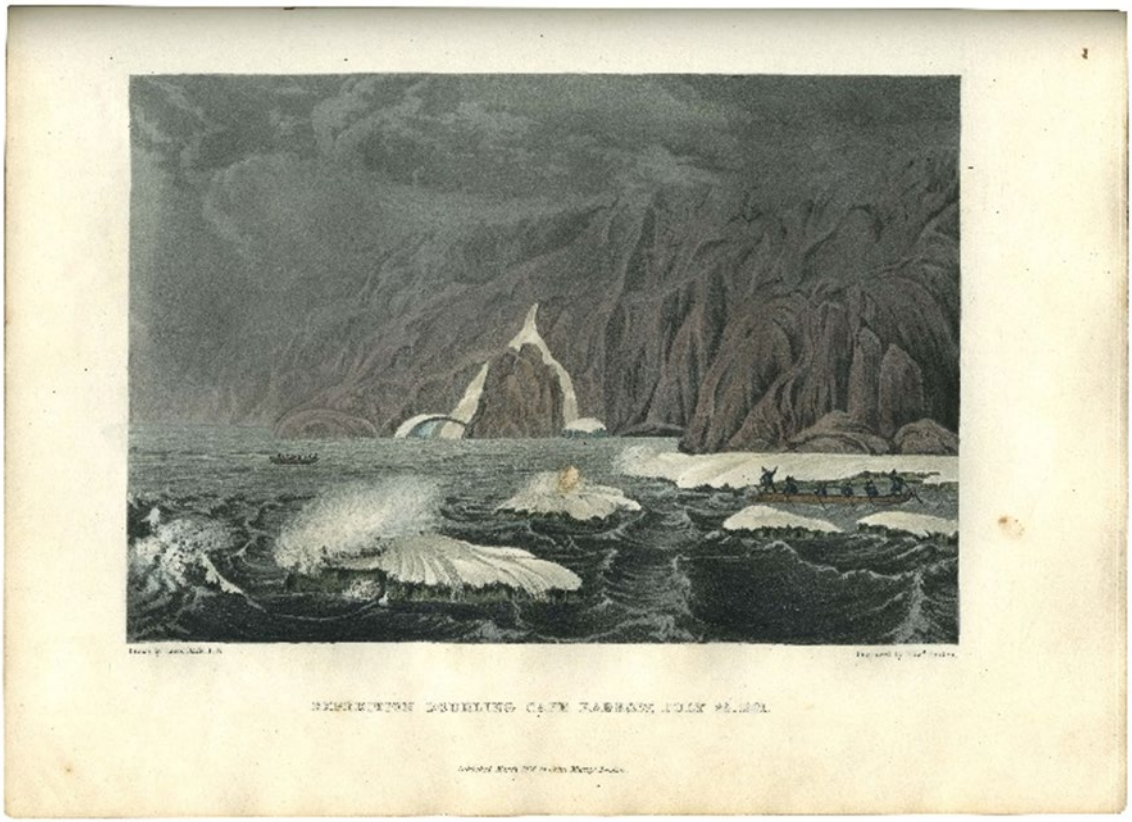
Narrative of a Journey to the Shores of the Polar Sea, 1823

The second document I will present is the account of the first exploration conducted by the renowned John Franklin in Canada's Far North (criterion 1), *Narrative of a Journey to the Shores of the Polar Sea.* The purpose of this journey was to map the Arctic coast from the mouth of the Coppermine River, which Franklin reached after a land expedition that started south of the Hudson Bay. Despite some catastrophic results, including the deaths of several members of his team, Franklin was seen as a hero upon his return to England due to the publication of this book, which remains a masterpiece of 19th century publishing.

John Franklin, Narrative of a Journey to the Shores of the Polar Sea, in the Years 1819, 20, 21, and 22, *London: John Murray, 1823, 768 p.*

The document is a classic travelogue, following in the footsteps of those produced by James Cook a few decades earlier (criterion 2). This expedition is one of England's many attempts, beginning in the 1820s, to find the famous Northwest Passage (criterion 4). On his journey, John Franklin was accompanied by cartographers, painters, and a doctor who was well-versed in botany and geology. The information they collected on the First Nation peoples, topography, hydrography, climate, fauna, flora, terrestrial magnetism, and mapping was later shared with the world through Franklin's travelogue. Knowledge of Canada's Far North therefore made a giant leap forward thanks to this narrative (criterion 5).

To present this expedition-turned-nightmare as a success, and to ensure that the government and public continued to support attempts to find the Northwest Passage, Franklin's employer, the Royal Navy, chose to publish the travelogue in a particularly attractive and luxurious form. The document was published in a large format and featured fold-out maps and engravings by a great artist of the day. The decision was even made to enhance the first edition with several hand-coloured engravings, which are today considered exceptional specimens of their kind (criterion 7). The book was received to tremendous acclaim; the first edition sold out quickly and a black market for second-hand copies even emerged (criterion 6)! The book's depiction of the North as a cruel territory that could be conquered by civilized people only with superhuman effort and at the cost of supreme sacrifice gradually ingrained itself in the collective psyche.

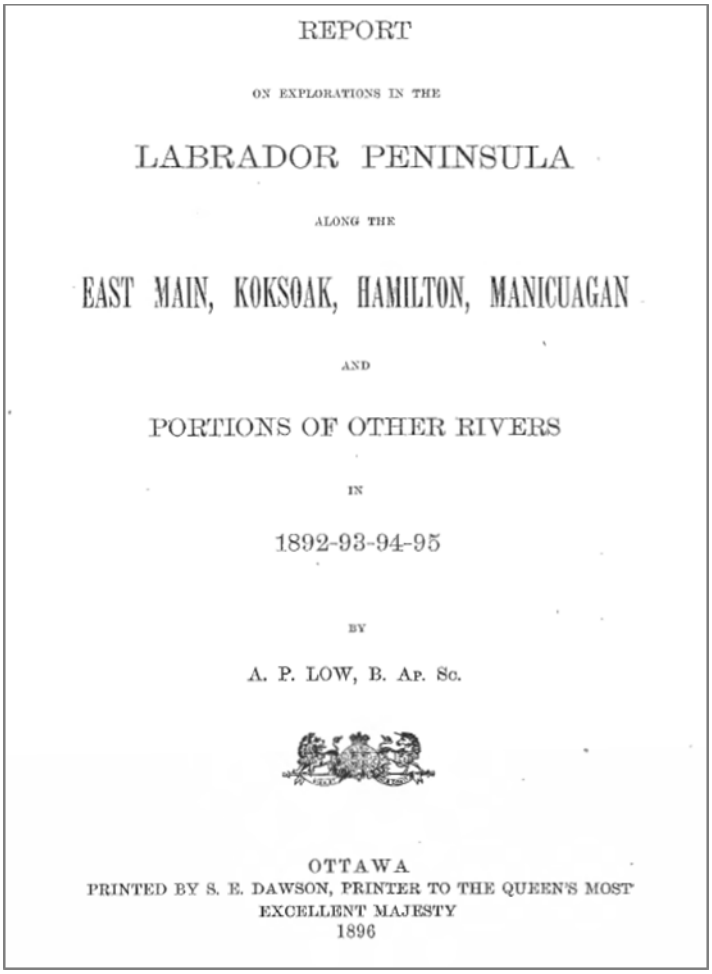


George Back (creator), Edward Francis Finden (engraver), "Expedition Doubling Cape Barrow, July 25, 1821" *[etching, aquatint, hand-colouring], in John Franklin,* Narrative of a Journey to the Shores of the Polar Sea, in the Years 1819, 20, 21, and 22, *London: John Murray, 1823.*

Report on Exploration in the Labrador Peninsula, 1897

The third and last document I will present was authored by Albert Peter Low. Although he is not as well-known as the authors of the previous two titles, he was nonetheless an important figure in the discovery of Canada's North. Low was a geologist and explorer employed by the Geological Survey of Canada; from 1892 to 1899, he covered several thousand kilometres of the Labrador Peninsula by foot, canoe, dogsled, and boat, accompanied by First Nation guides and assistants. His most important work is the *Report on Exploration in the Labrador Peninsula,* which was published in 1897 in Volume 8 of the *Annual Report of the Geological Survey of Canada.*

The document covers the area of Northern Quebec: mainly Quebec's Near North and a small portion of Quebec's Far North (criterion 1). It is a scientific report produced by a specialized body, and was therefore not intended for dissemination to the general public (criterion 2). Although only one edition of the report was published, it is available in English and in French, like all reports published by the Geological Survey of Canada (criterion 3).



REPORT

ON EXPLORATIONS IN THE

LABRADOR PENINSULA

ALONG THE

EAST MAIN, KOKSOAK, HAMILTON, MANICUAGAN

AND

PORTIONS OF OTHER RIVERS

IN

1892-93-94-95

BY

A. P. LOW, B. Ap. Sc.

OTTAWA
PRINTED BY S. E. DAWSON, PRINTER TO THE QUEEN'S MOST EXCELLENT MAJESTY
1896

Albert Peter Low, "Report on Exploration in the Labrador Peninsula along the East Main, Koksoak, Hamilton, Manicuagan and Portions of Other Rivers in 1892–93–94–95", Geological Survey of Canada, *1896, 322 p.*

Although this type of document is often dry and highly specialized, Low's book is different. The writing style and the content are both accessible and stimulating. In this work, Low depicted the many facets of Northern Quebec, such as climate, topography, soil, rivers,

human populations, and trees. In the numerous appendices, he included inventories of mammals, birds, fish, and plants. The wealth of information he provided is a testimony to his general conception of the territory (criterion 5). Although the report was not widely circulated, it has nevertheless caught the attention of specialized critics (criterion 6), who have identified this document as the main source of information on the Labrador Peninsula until the advent of aerial photography.[3] Finally, although the document's aesthetic appeal may at first seem limited, due to its austere appearance and the questionable quality of its paper — which has unfortunately yellowed over the years — it is worth noting that it contains some reproductions of photographs and paintings and, most significantly, some quality fold-out maps (criterion 7).

Conclusion: What Next?

In this presentation, we began thinking about the establishment of criteria for identifying founding documentary sources in the field of Northern Studies. An application of the proposed criteria to three works that are different in nature, time of publication, and geographical area covered seems to suggest that these criteria do indeed provide an operational assessment grid. But this is not enough to guarantee the usefulness of these criteria. That is why, over the coming years, we would like to set up an advisory committee composed of librarians, teachers, and book and map specialists with the goal of reviewing and adopting selection criteria. These will subsequently be incorporated into an official collection development policy. From then on, we will be able to formally identify founding documentary sources. We expect that by establishing sufficiently restrictive criteria, the list produced will include about 20 titles. A few questions will then arise: does the Library already have these titles in its collection of early works? If not (as will be the case for most of the titles), are these works available on the market? And if so, at what price? It will of course be impossible to obtain all the titles in the short term, and we will need to rank the works to give greater priority to some of them.

Initiatives aimed at promoting and showcasing these titles will then have to be undertaken. Building up a collection only makes sense if the works that compose it are given a high level of exposure. Although it is conceivable that certain major academic or national libraries may

already have several of the documents we wish to acquire, none of them seems to highlight the connections between the works, showcase them, or inform the public of them in a coordinated manner. The collection could be promoted with document training courses, websites, mobile applications, university courses, and, for the final initiative that we would like to carry out as part of our project, with the publication of a high-end photo book about the collection in both French and English.

But I would like to emphasize the fact that our main goal is to allow members of the public who are interested in the North to access these works, which often offer exceptional aesthetic features. Because we do believe, for instance, that it is no trivial thing for a Ph.D. student working on remote sensing of Canada's Far Northern border to be able to contemplate the original version of the first map to ever depict the Arctic Ocean shores. Because we are convinced that it is significant for a researcher interested in contemporary relations between Aboriginals and non-Aboriginals to be able to turn the fragrant, aging pages of one of the first works to recount early meetings between Europeans and First Nation peoples. It is a privilege to witness such moments; it is also an opportunity for us to see our work take on its full meaning.

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Introducing Two New Research Platforms: seaiceportal.de and expedition.awi.de (abstract only)

Marcel Brannemann, Alfred Wegener Institut, Bremerhaven, Germany

Seaiceportal.de (meereisportal.de) is an initiative of the Helmholtz Climate Initiative (REKLIM), the Alfred Wegener Institut (AWI), Helmholtz Centre for Polar and Marine Research, in cooperation with the University of Bremen (Institute for Environmental Physics). Its aim is to gather all important and up-to-date information connected to the subject of sea ice. The portal is offering comprehensive background information, processed data, and direct access to the database. Meereisportal.de was laid out as an open portal and shall serve scientific groups performing research on sea ice as a platform for communicating the results of their research. Meereisportal.de is offering users direct access to various datasets from sea ice observation and research, www.meereisportal.de/en/services/about-us.html.

The portal EXPEDITION has been developed by the Computing and Data Centre of AWI's Helmholtz Centre for Polar and Marine Research. EXPEDITION is meant to be a one-stop shop for scientific output associated with AWI research platforms, in particular the research vessels *Polarstern* and *Heincke.* As authoritative source for expeditions associated with these vessels, efforts are being currently undertaken to assure synchronization with Cruise Summary Reports from SeaDataNet. The content displayed in this web page consists mainly of validated tracklines, publications, and reports from EPIC repository, and primary data from PANGAEA — Data Publisher for Earth & Environmental Science http://expedition.awi.de/about.

Establishing a Digital Library Service for the Inuvialuit Settlement Region

Sandy Campbell, John W. Scott Health Sciences Library, University of Alberta, Canada &
Ali Shiri, Dinesh Rathi, Cathy Cockney, Sharon Farnel, Elaine Maloney, and Robyn Stobbs

The Inuvialuit Settlement Region (ISR) is an administrative and cultural area of northwestern Canada. The Inuvialuit Cultural Resource Centre (ICRC) in Inuvik is the main library service for the ISR, holding much primary information in the form of photographs, oral history recordings, and other materials that capture much of the history of the Inuvialuit people. The population of the ISR is sparse and dispersed through a number of communities that are remote from each other. A collaborative research group including representatives from the ICRC and the University of Alberta have undertaken a research project with the purpose of building a digital library service, which would supply the Inuvialuit people with access to digitized materials. The work began with an environmental scan of the information needs and uses of people in the ISR, research into the building of a scalable digital library framework, and research into culturally appropriate and multilingual indexing. Sustainability of the products and community ownership of the products are foundational values for this research project.

Background

The Inuvialuit Settlement Region was established in 1984 by an agreement between the Committee for the Original People's Entitlement (COPE) and the Government of Canada. The agreement is known as the Western Arctic Claim: The Inuvialuit Final Agreement.[1]

Under that agreement, the Inuvialuit Cultural Resource Centre was established as one of several corporations to receive the benefits of the settlement. The ICRC opened in 1998 in Tuktoyaktuk and moved to Inuvik in 2000. It has three parts to its mandate:

- Preserve the Inuvialuktun language with the assistance of elders.
- Provide support and a language curriculum for Inuvialuktun teachers.
- Promote the ongoing development of the Inuvialuktun language.

The Inuvialuit Settlement Area stretches from Canada's western Beaufort Sea coast, north to the Arctic Ocean, taking in Banks Island, part of Victoria Island, and several other islands north of the Parry Channel. The ISR includes six settlements: Aklavik, Inuvik, Paulatuk, Sachs Harbour, Tuktoyaktuk, and Ulukhaktok. The distances between the settlements are great. For

example, Inuvik and Sachs Harbour are 513 km apart, while the distance from Tuktoyaktuk to Ulukhaktok is 593 km. The ICRC has a mandate to serve all of the communities.

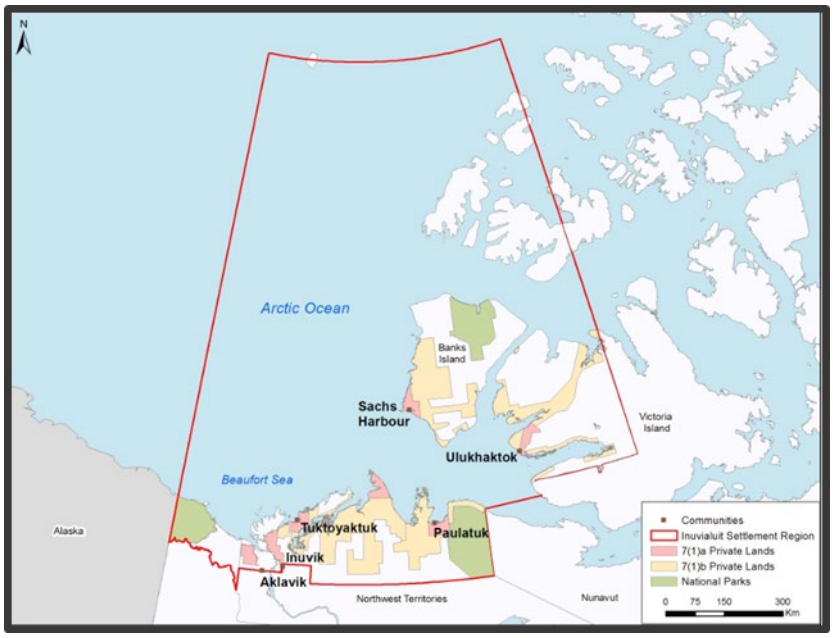

Figure 1. *Map of the Inuvialuit Settlement Region. Inuvialuit Regional Corporation, Jenn Perrott, 2016.*

The ICRC houses a library, archives, and artifact collection, as well as office and meeting spaces. The ICRC collections include materials in a variety of formats, including some digital. It also has an internal database that lists some of the materials. However, the database and the digitized materials are not available through the internet. The purpose of this project is to create a digital library, which will make materials accessible through the internet.

Figure 2. *Stobbs, Robyn. Tusaayaksat Building in Inuvik, NWT. 2014. Photograph. University of Alberta. School of Library and Information Studies. Digital Library North.* https://era.library.ualberta.ca/files/b2n49t176j#.VwCrFqQrK70 Accessed July 3, 2016

In 2013 the ICRC collaborated with researchers at the University of Alberta in Edmonton on a successful Social Sciences and Humanities Research Council (SSHRC) grant to create a Digital Library for the Inuvialuit Settlement Region. The project, called The Digital Library North, was funded for a three-year period beginning 2014.

Methods

Several strategies contributed to the success of this grant and the current and ongoing success of the project: making the community an equal partner with the academic researchers, ensuring frequent contact and strong communications between the community and the researchers, ensuring that community needs and preferences defined the development of the project, focusing on culturally appropriate development, and making community-based sustainability a primary outcome of the project.

Community – Academic Partnership

From the beginning of the grant writing process, Cathy Cockney, Manager of the ICRC, was a member of the research team. In addition to regular e-mail contact, the team held video conferences and in-person meetings. At least once per year, representatives of the ICRC were present at the University of Alberta for meetings. Various Edmonton-based members of the

research team have visited Inuvik on a number of occasions, sometimes staying a few days, sometimes undertaking several months of on-site research.

Community Needs and Preferences

Early in the project, time was invested in research team members getting to know each other and in the Edmonton-based members, getting to know the ISR and its people. Discussions and fact-finding missions led to an understanding that documenting the community information needs and preferences would be a complex process. The team chose to develop an environmental scanning model, adapted to the unique needs and environment of the ISR. This model has been described elsewhere.[2] Once the model had been refined, data was collected on-site in Inuvik through a variety of methods including surveys, focus groups, and interviews. Key to the success of the data collection process were innovative community connection and project advertising activities. The ICRC held an open house to introduce the project. Researchers then promoted the surveys at information tables at a variety of sites in Inuvik — North Mart (store), Inuvik Centennial Library, Midnight Sun Complex, and at Inuvialuit Day celebrations. Teachers, librarians, researchers, and interested members of the public were interviewed.

Culturally Appropriate Development

Based on the needs defined by the ICRC and the information retrieved through the environmental scan, a prototype digital library was created on servers at the University of Alberta, using an installation of Omeka, an open-source software designed for managing digital collections. Because of diversity in formats of the ICRC's collection (e.g., images, video, text), particular attention was paid to developing a robust delivery system for different kinds of formats. Additionally, an interface is being developed to be searchable in the three Inuvialuktun dialects (Siglitun, Uummarmiutun, and Kangiryuarmiutun), as well as English. A Dublin Core-based metadata structure was developed.

In Spring 2016, the prototype was demonstrated to a number of community members, many of whom had taken part in the original environmental scan. An open house was held for public feedback. The project was demonstrated to several classes at the secondary school and a testing day was held for ICRC and IRC staff.

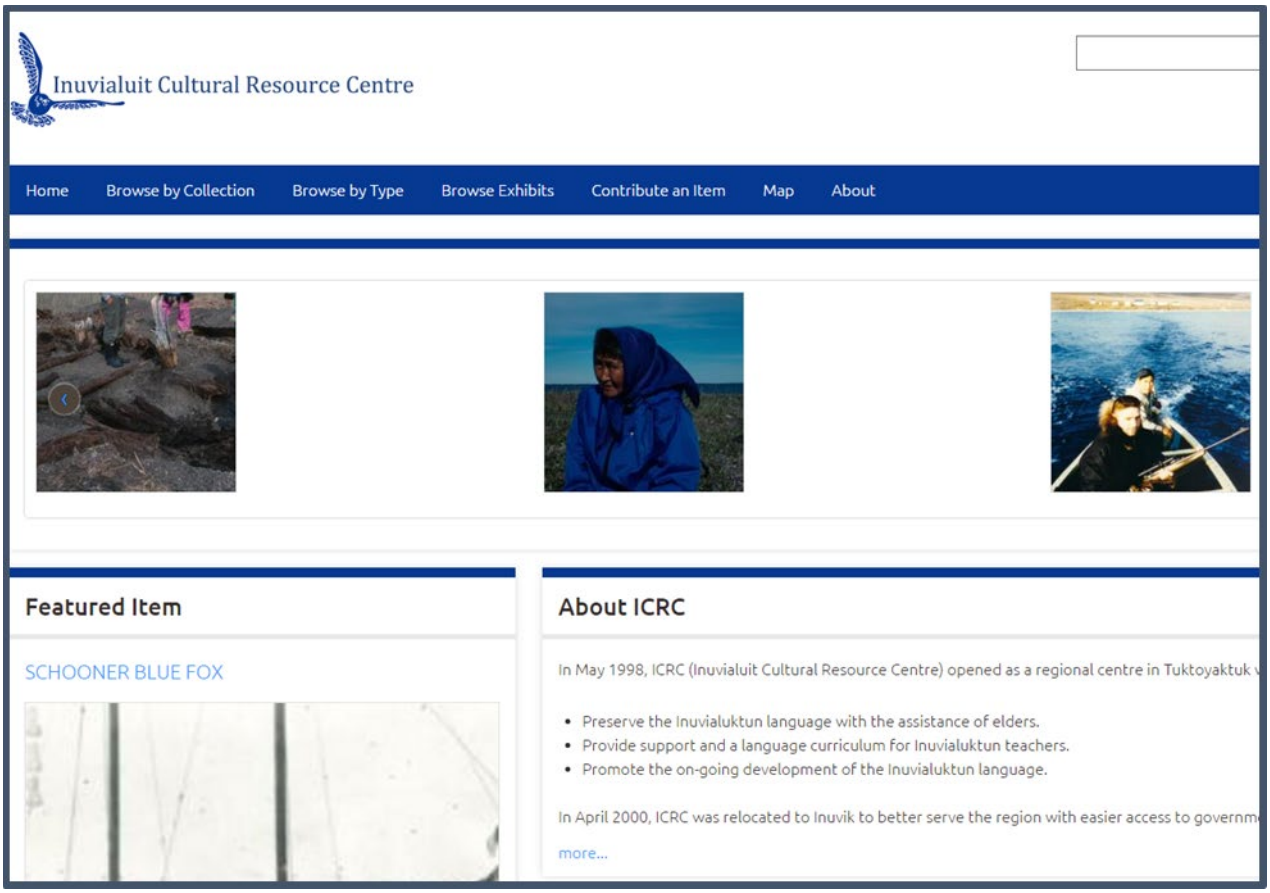

Figure 3. *Interface for the prototype digital library for the Inuvialuit Cultural Resource Centre.* Accessed July 3 [2016]

Feedback from participants in demonstration sessions was used to improve both the design of the digital library web page and metadata. For example, testing revealed that many people valued visually-based access points, so icons and more thumbnail images were added. A map interface was added reflecting the community's desire to search by place. Some metadata tags were altered to reflect more commonly used terminology. For example, community members thought the tag "spatial coverage" should be replaced with the word "place".

Community-based Sustainability

Long-term community-based sustainability was a goal from the beginning of the project. In addition to having ICRC members as guiding team members, a number of initiatives are being taken to ensure sustainability. In 2016, a post-secondary student from the community, but studying in Edmonton, was employed to work in Inuvik for the summer, developing skills related to the digital library. ICRC staff members have received training in various aspects of the digital library and more training will be provided as necessary, to ensure that staff can take ownership of the digital library.

Work has also begun on the development community training sessions, to ensure that the community is introduced to the digital library and are comfortable using it.

Next Steps

Over the next two years, the metadata structure will be further developed. More work needs to be done both on the web presentation and improving the multilingual interface. Work will also continue on defining and supplying within the interface, different levels of access to more or less-sensitive materials. More material will be added to the digital library according to the priorities defined by the ICRC. Efforts will be made to hire more students over the next summer. User training will be developed and delivered in the six communities of the ISR.

Conclusions

The Digital Library North project is both an academic research project and also the practical development of a tangible product that will meet the needs of the Inuvialuit Cultural Resource Centre and its user community. In addition to the delivery of the digital library product, which is well underway, the project has also generated several academic works including papers (references 2–7), and posters and presentations (references 8–17). The project also has a Facebook page https://www.facebook.com/digitallibrarynorth/ and a website https://sites.ualberta.ca/~dln/. All of these works, along with media coverage (references 18–23), have served not only to highlight the role of the academic undertaking, but also the unique geography, people, and culture of the Inuvialuit Settlement Region.

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Changing Patterns of Polar Research

Andrew Gray, British Antarctic Survey, National Environment Research Council, UK

Abstract

Polar research, as an interdisciplinary subject, has developed extensively over the years. Starting from a simple emphasis on geographical exploration, it has grown to encompass a wide range of fields from genetics to geomagnetism. The relative emphasis and importance of different disciplines has shifted over time, with some historically active fields now relatively unimportant, and others growing in their stead. Some of this reflects general trends in the wider scientific community, while others are particularly relevant to the polar context.

This paper surveys the way in which the disciplines making up "polar research" have changed over time; how this has changed in different ways in Arctic and Antarctic research; how the focus of research has changed from the Antarctic to the Arctic; and the change in the overall emphasis placed on polar science by different countries.

Methodology

This study uses a bibliometric approach, looking at overall publication numbers. Numbers are taken from the Scopus database, and as such may not directly correlate to those in the (more frequently used) Web of Science/Web of Knowledge database. Scopus offers certain features which are helpful for this study, including more fine-grained filtering options and a better inclusion of non-journal material.

The main search method used was the general "article title / abstract / keyword" search, which would pick up on any use of the target phrase within these fields. The default search for Arctic papers was simply “arctic”, and for Antarctic papers “antarctic*” (to pick up Antarctica). Data was collected in late June 2016, by which time the majority of data for the 2015 publication year was expected to be complete.

Scopus records two sets of keywords, those assigned by the author/publisher (more targeted) and those assigned by database maintainers (more consistent). In the absence of manual checking, this approach will inevitably lead to false positives; as a study which (for example) uses the phrase "found on every continent except Antarctica" in the abstract would be identified as Antarctic-related. However, this effect was found to be relatively small; in 2010–15, there were 15,820 Antarctic papers, of which only 122 used the phrases "not antarctic*",

"excluding antarctic*", or "except antarctic*". As this was less than 0.8% of papers, it was not felt necessary to include such a filter in the searches. The totals thus will include a small rate of false positives, but this is unlikely to materially affect the overall results.

One unexpected issue found during the work is that Scopus indexes by country, but does so anachronistically and inconsistently. In most cases, country affiliation is based on the current location, rather than the contemporary political situation — papers published with affiliations in East or West Germany are assigned to "Germany", for example. The major impact of this was on our data for Russia and the USSR; most, but not all, Soviet research was carried out in what is now the Russian Federation, and it is reasonable that these were assigned to Russia under the Scopus model. However, work by authors affiliated elsewhere in the USSR (for example, Tallinn or Kiev) is assigned inconsistently; some of it is marked as Russia or the Russian Federation, and some of it as the current state, in this case Estonia or Ukraine. For the time being, this complication was ignored. The proportion of unknown country affiliation is very high until the early 1990s, and so the comparative analysis began in 1996, neatly avoiding the effect of Soviet-era data problems. However, it is noted here in case further work might need to examine this inconsistency in more detail.

Overall Volume of Research

In an absolute sense, the volume of polar research published has risen dramatically over time, from a total Arctic and Antarctic output of ~250 papers/year in 1970 to ~7000 in 2015. (Numbers before 1970 were sufficiently small that annual variations drowned out overall change and were not analysed.) While this is predominantly a real phenomenon, it should also be noted that a general shift towards publishing research in journals rather than in less well-indexed technical papers, expedition reports, etc., is also playing a role here.

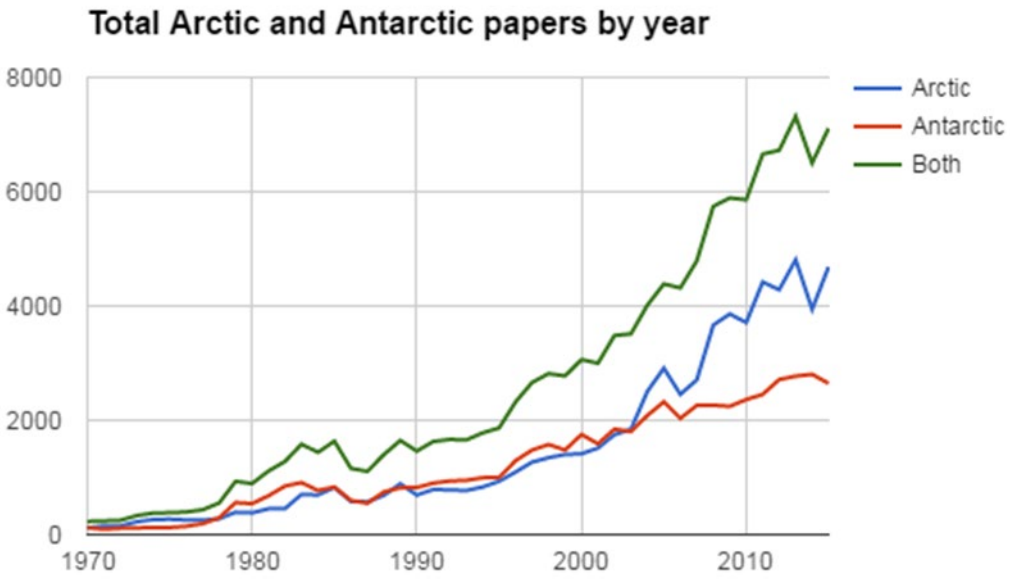

Fig. 1. *Total number of Arctic and Antarctic papers by year.*

Looking at the graph (Fig. 1), there is a noticeable first uptick in the late 1970s, a slow rise until the mid-1990s, and then a steeper rate of increase to the present day. The overall volume of papers is broadly equal in both the Arctic and Antarctic until about 2005, when the lines diverge sharply and the Arctic numbers accelerate much more quickly; by 2015, Arctic papers make up two-thirds of the total.

Relatively little material overlaps between the regions, with only about 4% of the total found in both searches.

Geographical Focus

With work done in the Arctic, it is reasonably easy to identify the geographical focus of research — work done in Alaska, for example, will almost always mention the term "Alaska" somewhere in the abstract or keywords. This is less true in the Antarctic, where the lack of convenient political boundaries means that many geographical terms are relatively local, and hard to group into larger areas.

In Fig. 2, "Canada" is calculated as the composite of Arctic papers which also name either Canada itself or certain regional keywords (Nunavut, Baffin, Northwest Territories, etc.); "Russia" includes any Arctic paper mentioning the USSR or Siberia; and "Scand." is a composite of those papers mentioning Norway, Sweden, Finland, as well as Scandinavia generally. The data is smoothed with a three-year moving average.

We can see that historically the largest proportion of research was done in Canada, but after about 2000 this share fell noticeably, stabilising around 2005; a similar, though less marked, decline is visible for Alaska. Work in Arctic Russia fell off sharply in the 1980s and did not recover until after the fall of the Soviet Union. The significant rise in recent decades has been in Scandinavia (including Svalbard) and Greenland, with an unexpected but significant spike for Iceland circa 2007–2008.

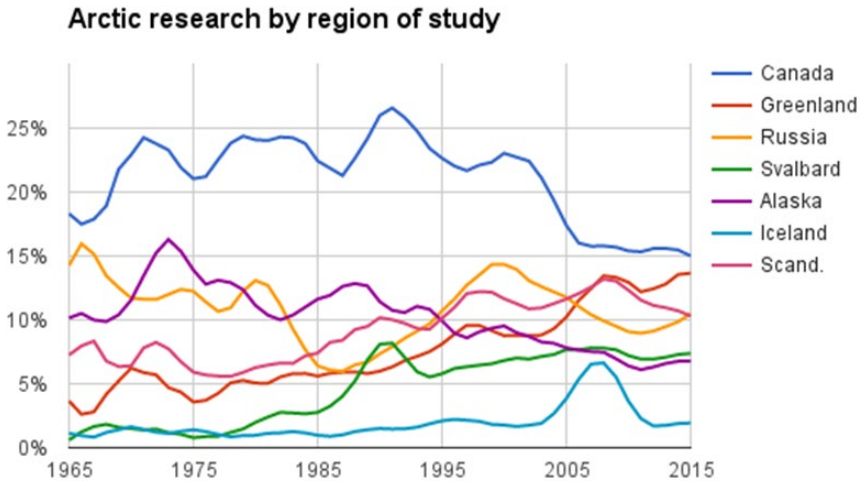

Fig. 2. *Regional focus of Arctic research (3-year moving average).*

Topical Focus

The topical focus of published research has shifted dramatically over time. Here, topics are taken from Scopus, and it should be noted that many papers will have two or more general topics assigned. In the Arctic (Fig. 3), we can see that the dominant field over the past three decades has been earth sciences, with 40–55% of papers assigned to this field by Scopus, up

from just 16% in 1975. Environmental science is closely correlated to the earth sciences, with a similar rise in the 1970s and 1980s, but has fallen off faster since around 1995.

There has been a general increase in biology over time, and a general decline in medicine (though this is showing something of a resurgence in the last five years). The most striking development since 2005 is the dramatic increase in Arctic-related engineering and energy research. Energy increased substantially from 2–3% in 2005 to over 20% in 2010, and engineering work had a closely correlated spike. This ties in with a substantial interest in Arctic oil and gas resources in the latter part of the decade, and is an interesting demonstration of how closely political and economic forces can drive research activity.

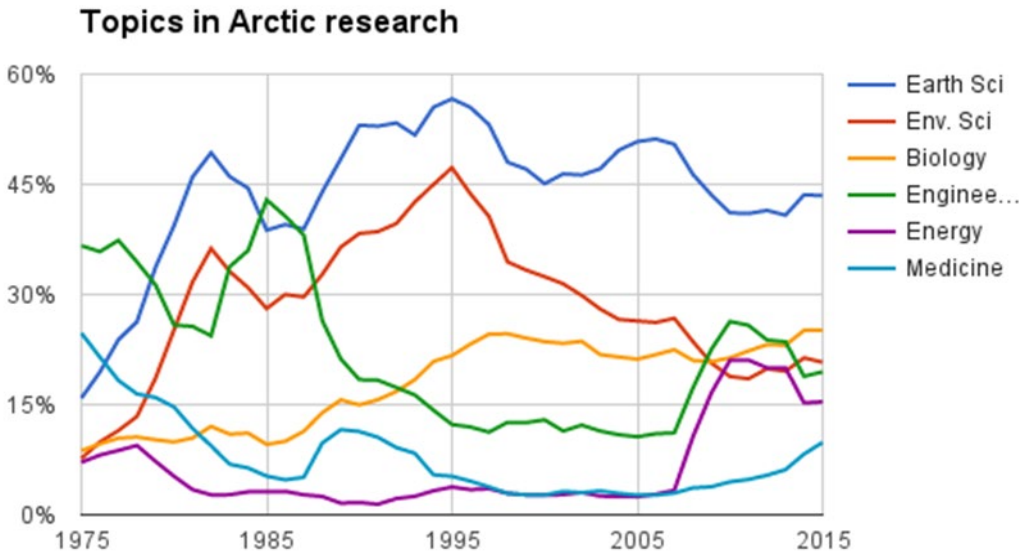

Fig. 3. *Topic focus of Arctic research (3-year moving average).*

The Antarctic, as might be expected, involves less "applied" research — it is overwhelmingly dominated by the earth sciences and environmental science (Fig. 4a). As we saw with the Arctic, however, there is the same pattern of a rise in the 1970s and a decline since 1985.

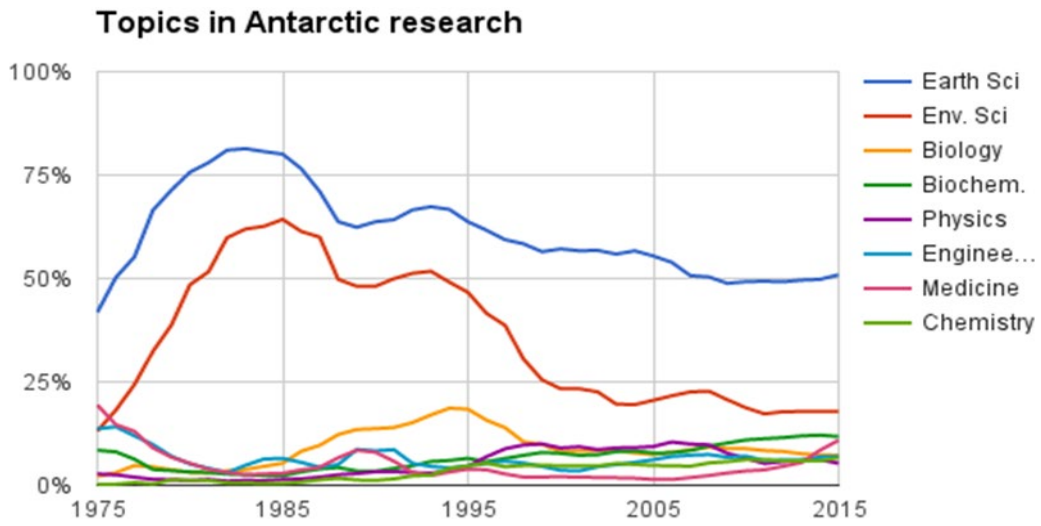

Fig. 4a. *Topic focus of Antarctic research (3-year moving average).*

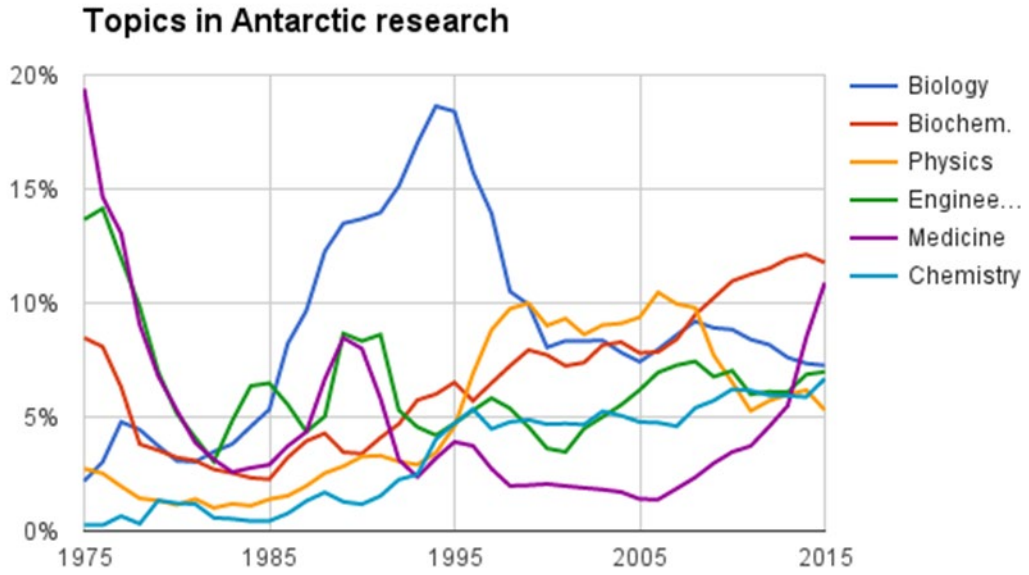

Fig. 4b. *Topic focus of Antarctic research, no earth/environmental science (3-year moving average).*

These two topics dominate the graph, so removing them (Fig. 4b) allows some more nuanced examination. There is a general trend of growth in recent decades for biochemistry (including

molecular biology and genetics), and a sudden leap in medicine. Physics has dropped off after recent growth, and "traditional" biology has fallen some way from its 1990s peak. However, these are all relatively small groupings compared to the Arctic data, and consequently more care should be taken when interpreting them due to the effects of random variation.

In general, the changes in the Antarctic are less marked than the Arctic, where there have been some very substantial changes including the growth of "applied" areas of research.

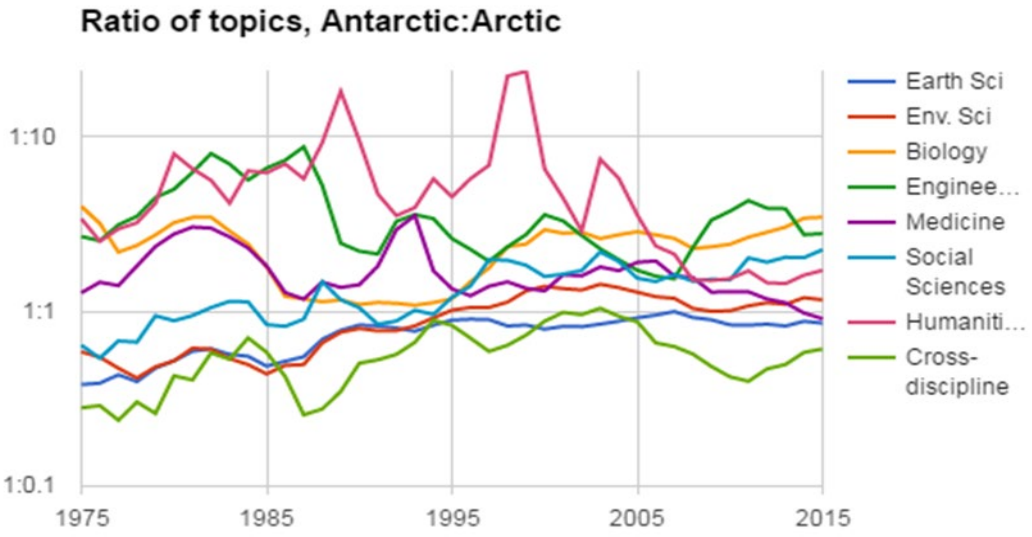

Fig. 5. *Relative trends between regions (3-year moving average).*

In Fig. 5, we can see the relative split between the regions within disciplines. The majority are predominantly Arctic, but earth sciences, environmental sciences, and cross-disciplinary research are historically more Antarctic-oriented. Most are now flattening out, with a general shift towards the Arctic visible — which matches the overall results we saw in Fig. 1. The earth and environmental sciences are now roughly equal overall, and every other field except cross-disciplinary work leans towards the Arctic.

One field with a distinctly unexpected result is the humanities, which has had a substantial increase in the relative share of Antarctic work since ~2000. On examination, this appears to

reflect a large amount of work looking at Quaternary climate change, which is classed as "humanities" because the journals it is published in also carry a large amount of archaeology. It is a useful caution that assigning metadata on a journal level can have complex implications.

Output by Country

A key question is not just the areas and fields being studied, but which countries are carrying out research. A proxy measure for this is the national affiliation of authors on papers. Prior to 1996, Scopus has limited data, and so 1998 is used as an initial cut-off date for a three-year moving average. Note that international collaboration — very common in polar work — means that many papers are counted twice or more. For the Arctic, the countries examined are those actually inside the Arctic, plus a number of non-Arctic countries with significant Arctic research programs. For the Antarctic, the countries used are those with significant Antarctic research activity and some "Antarctic neighbour states" — smaller countries with proximity to the Antarctic and thus a substantial research interest. Percentages are of the total number of Arctic/Antarctic papers that year, including those authored by countries not examined.

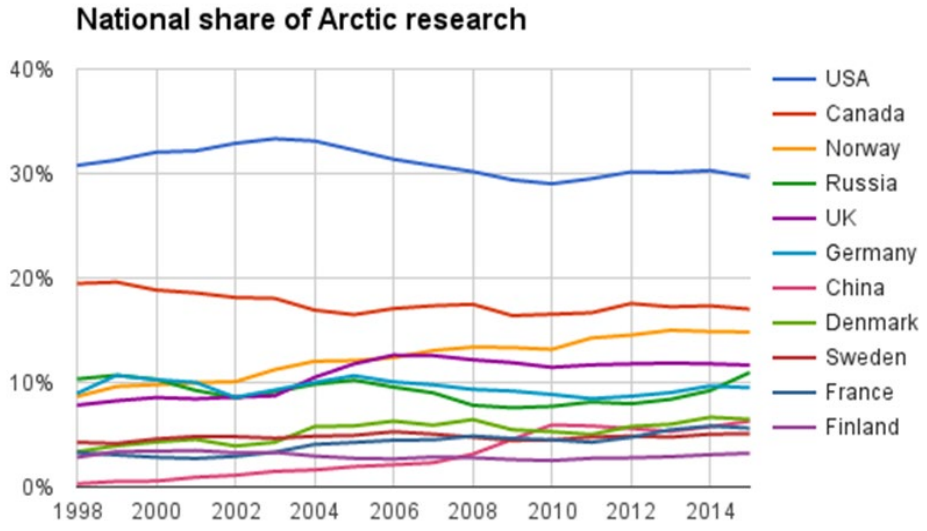

Fig. 6. *Arctic research papers by country (3-year moving average).*

In the Arctic, the dominant country is the United States, followed by Canada. Both show a slight relative decline over time as other countries grow, but no dramatic falls.

In the lower group, however, more substantial changes are apparent. Most countries show a gradual but significant rise, or, at worst (Finland, Russia) a slight decline and recovery. One particularly noticeable riser is China, which goes from virtually nothing to 6% of the total — indicating a very significant national investment in Arctic research.

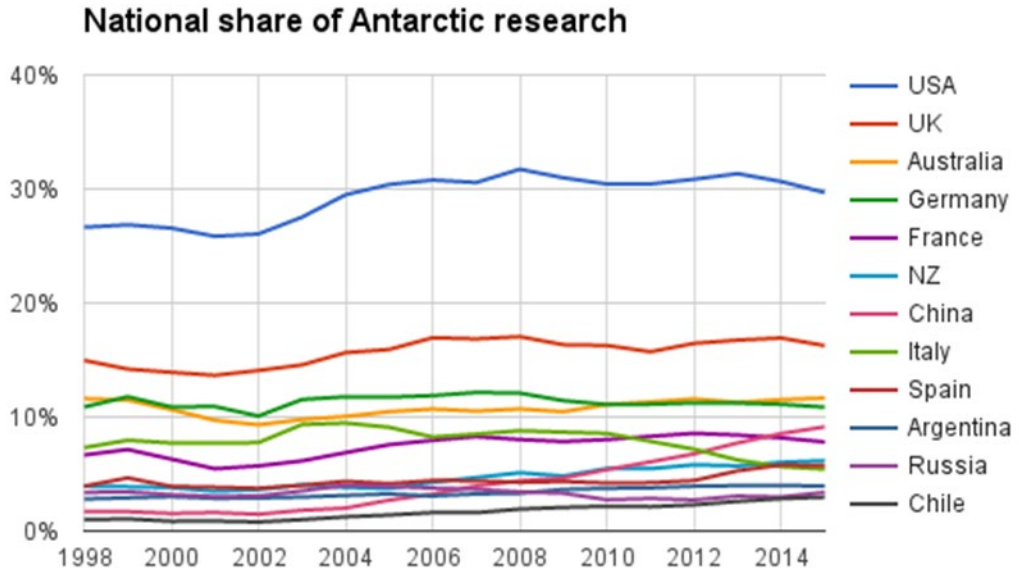

Fig. 7a. *Antarctic research papers by country (3-year moving average).*

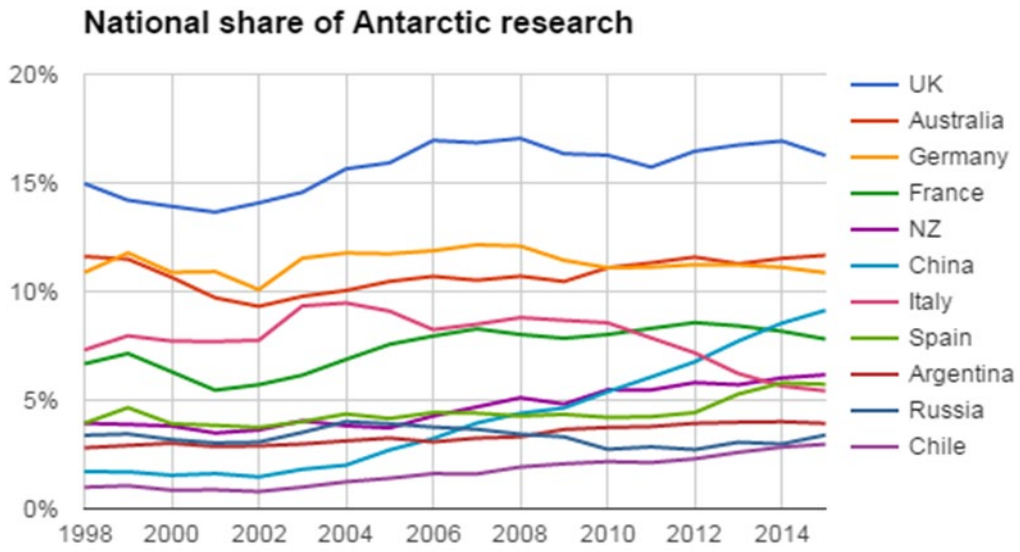

Fig. 7b. *Antarctic research papers by country, no US (3-year moving average).*

In the Antarctic, we see a different pattern. The United States is, again, the dominant party. The second place is the United Kingdom, followed by Australia and Germany — all states with long-running and substantial Antarctic operations. There is a bit more variation in the lower group, and we can see, for example, a fairly significant drop by Italy, a steady growth by New Zealand and Chile, and a recent spike by Spain. The biggest rise, again, comes from China.

In both regions, most countries show a gradual rise in their share overall, which in part represents a growth in collaborative research — more countries sharing the total pool of papers.

For both the Arctic and Antarctic, the raw size of a nation's scientific output does matter. The United States is the dominant country in both, with around ~30% of papers in each group. In the Arctic, the second tier country is Canada; in the Antarctic, the UK. These are all wealthy countries with substantial research communities and so a high number of papers would be expected even if polar work is relatively insignificant within those nations.

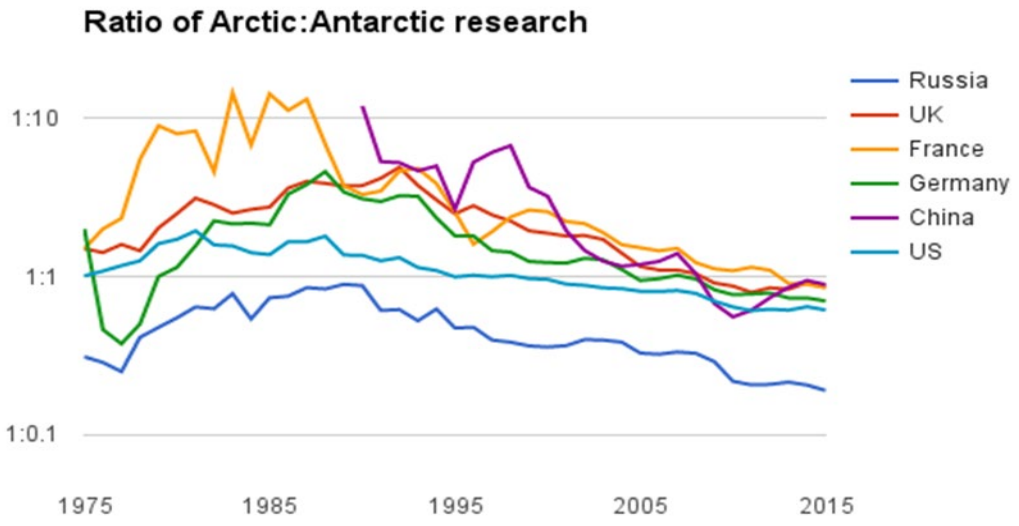

Fig. 8. *Ratio of Arctic to Antarctic research in selected countries.*

Looking at the ratio of papers produced in any given country is also interesting. Five of the six countries studied with major Arctic and Antarctic programs had a historic bias towards the Antarctic, which has become more Arctic-oriented since around 1990. The exception was the USSR/Russia, always predominantly Arctic-oriented, though the same Arctic tendency is visible. By around 2005–2010, all six countries produced more Arctic than Antarctic research — the last to cross the line was France.

Building on this, an interesting approach is to look at "research focus" — the proportion of a country's output which is focused on polar science. This measure allows large and small countries to be compared in a more direct fashion. Because we are looking solely at the set of papers with an identified national affiliation, we can tentatively set aside the large number of pre-1996 unidentified papers and push our data back several decades.

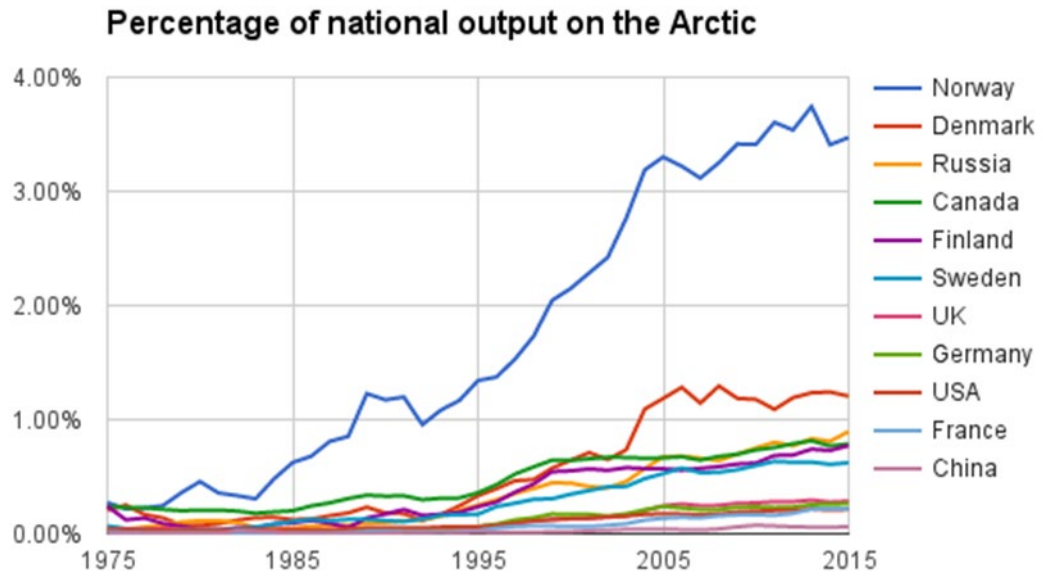

Fig. 9. *National emphasis on Arctic research (3-year moving average).*

Using this measure, it is abundantly clear that Arctic research is a priority for Norway — around 3.5% of national output is Arctic-focused. This is, perhaps, unsurprising; Norway is a wealthy nation with a very substantial part of its landmass and population above the Arctic Circle, including several university and research institutions.

The remaining countries show an interesting grouping. Denmark (including Greenland) is a noticeable second place, leading a group that includes Russia, Canada, Finland, and Sweden. These are all Arctic states — in fact, with the exception of Iceland (very small) and the United States, they are all of the states with Arctic territory. They have between 0.5% and 1.2% of their national research output focused on the Arctic.

The third group (UK, Germany, US, and France) are all countries with historically strong Arctic research programs — and, with the exception of the US, none have Arctic territory. Arctic research is an interest for them, but not as important as it is for the Arctic states; they average around 0.25% of national output.

Finally, China is very low. Its output is in the range of 0.06% of national research activity. This is very striking when looking at its absolute output; while China's Arctic research has grown dramatically, its output in all other scientific fields has risen at much the same rate.

With the exception of Norway, which has shown a consistent rise through time, most national activity shows a turning point in the 1990s, when the rate of growth visibly increased. This is very interesting, and suggests a common trend in the development of research focus. However, it may also be an artefact — the data from before 1996 had a much larger volume of papers with no national affiliation recorded — and if this was not evenly distributed, there might be unusual effects.

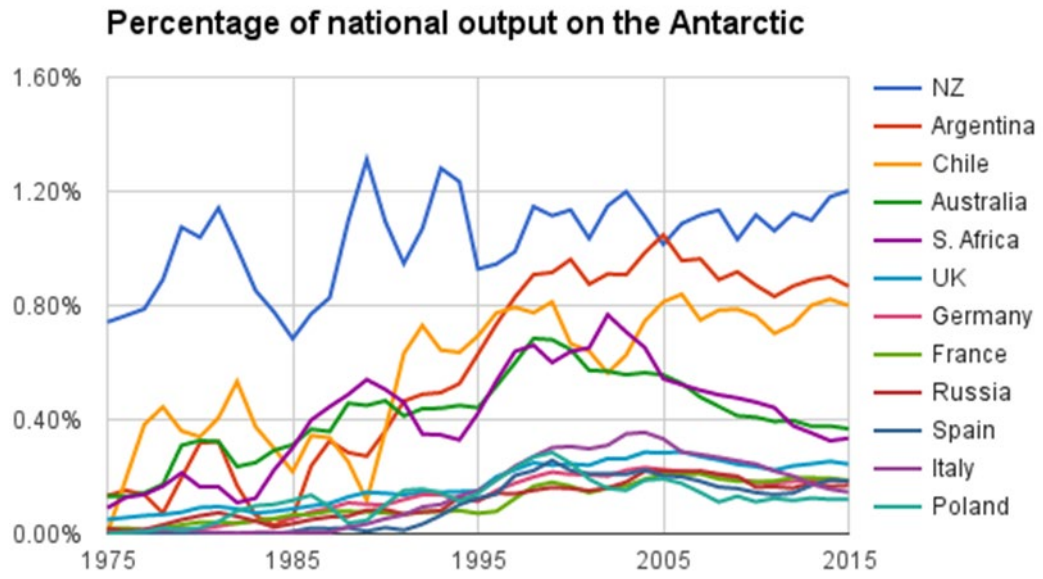

Fig. 10a. *National emphasis on Antarctic research (3-year moving average).*

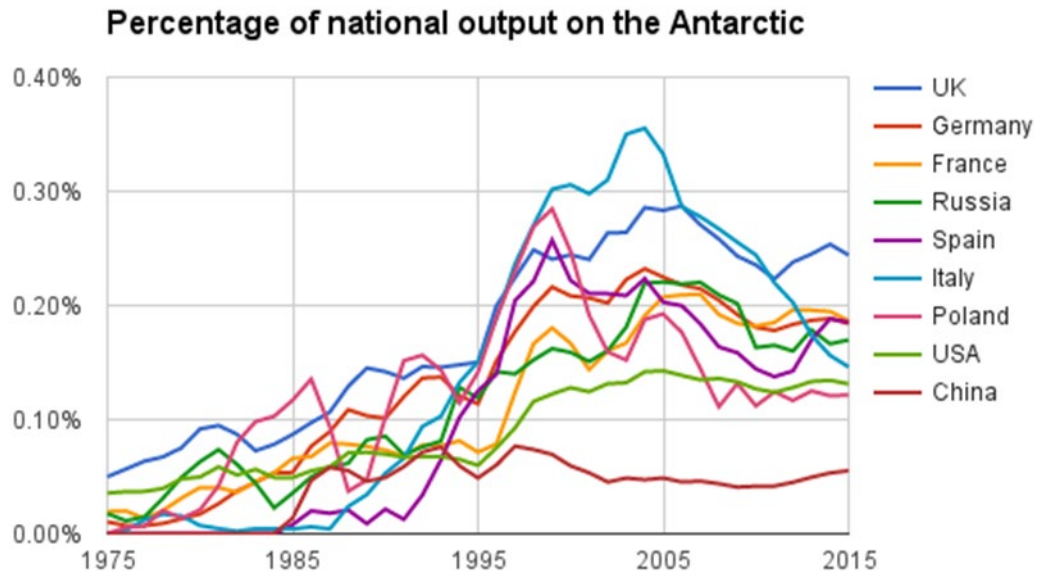

Fig. 10b. *National emphasis on Antarctic research, no Antarctic neighbours (3-year moving average).*

The Antarctic data (Fig. 10a) shows a different pattern. Again, a small, wealthy, and "locally oriented" nation has the highest intensity — New Zealand, averaging around 1% of all papers published. However, this is consistent throughout the period; Antarctica is not becoming a more significant part of the national research program. Argentina and Chile — again, small countries with close Antarctic links — grow their scientific programs substantially through the period, rising to a slightly lower intensity than New Zealand (~0.8%) by the late 1990s, and then stabilising. The remaining two "Antarctic neighbours", Australia and South Africa, show a similar rise — but peak at around 0.75% in the late 1990s and drop off as other fields become more prominent. This may be an anomaly — again, it is close to the 1996 data transition point — but it is perhaps less likely, as it affects different nations in different ways.

Looking at just the lower part of the graph (Fig. 10b), the states with active Antarctic programs but which are not "Antarctic neighbours", shows a generally consistent pattern. Most countries grow in the 1990s, and peak or plateau by 2000. Some — Germany and Italy, for example — show a very significant drop in intensity. We already saw this for Italy with the

absolute drop in paper numbers, but Germany is simply a relative drop, suggesting other fields simply became more interesting to German researchers (or research funders). The UK, France, Russia, and the US are all broadly stable from about 2000 onwards, with an intensity of 0.15%–0.25% — somewhat less than their Arctic output. China is also broadly stable, though as with the Arctic data, it is much lower than comparable nations due to the rapid expansion of Chinese research in all fields.

This data is very provisional, particularly as it relates to numbers before the mid-1990s, and further work is needed to identify what effects this might have. However, it provides an interesting way of examining national scientific activity without being skewed by the underlying size of the country. This is particularly interesting in the Antarctic, where a role in governance (through the Treaty system) is implicitly linked to an active scientific program, as being able to demonstrate "substantial research activity" is important for a country wishing to obtain consultative status.

Previous work in Antarctic bibliometrics has looked at absolute numbers of papers (e.g., Dastidar 2007; Ji et al 2014), citation volume (Fu & Ho 2016), or production of Treaty documents (Dudeney & Walton 2012). The latter study used a comparison of Treaty documents to overall scientific output (finding a general correlation) but did not drill down further to examine Antarctic-specific output. It also presented a comparison of Treaty documents with GDP, though as the share of GDP spent on research can vary dramatically between countries, this is only an indirect proxy for research investment. Interestingly, it found that the most productive countries by the GDP measure were New Zealand, Argentina, and Chile, with the US "way down the pecking order" — suggesting they prioritise Antarctic work, and a very similar result to the intensity data.

This similarity is promising. It suggests that a "focus" or "intensity" based assessment can provide a way of identifying and recognising substantial investment in a polar scientific program by a smaller country, above and beyond simple volume of research outputs. Indeed, it might help quantify the suggestion recently put forward that a small program could make a significant commitment to Antarctic science without any significant logistical activity (Hughes, 2015).

Building further on this approach, the intensity method could usefully be combined with article-level citation data as a quantification of "impact", as in the recent Fu & Ho study, refining it to identify not just the proportion of a nation's output that is going into polar work, but also the relative quality of that output compared to its work in other fields.

Conclusion

We have seen that a bibliometric approach allows us to see general patterns in the focal areas of polar research over time, with changing emphasis on different fields of research and different geographic areas, and a shift in emphasis by different countries.

Of these, the change in "intensity" offers interesting approaches for interpreting research activity, particularly in the Antarctic context. More work is underway on this, and will be published in future, looking at it in the context of a number of other alternative measures of scientific activity.

The data presented here is drawn from a single source and should be treated with some caution; a useful avenue for future work would be to assess how representative the country data is prior to 1996, and whether other data sources could be used to calibrate this or to fill gaps. A study of records in the *Antarctic Bibliography* could well provide useful data going back several decades, and would also allow more non-journal material to be included in the data.

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Mapping the Rescue of an Archive

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One of the biggest challenges facing small special libraries and archives is continued funding for personnel, proper archival supplies, preservation, conservation, and especially new collections. This is especially true for "soft money" organizations and small institutions, or small collections buried somewhere in a larger university or institution.

For almost 12 years, the archivist and librarians at the Roger G. Barry Archives and Resource Center (ARC) have made multiple attempts to save the archives housed within the National Snow and Ice Data Center (NSIDC). These materials date back to the mid-nineteenth century and include glass plate negatives, thousands of glacier photographs, rolls of film photographed during flyovers of Greenland and the Arctic, and much more than can be documented here. The collection's value to science and research is immeasurable, as is its monetary value. Many of these items do not exist anywhere else.

In 2004, Allaina Wallace and I took the archivist and librarian positions without a complete understanding of "soft" money funding and what that would mean to our ability to care for all of the items in the library and the "analogue" collections. For the first few years, our funding and my acquisitions monies remained stable, so we naively thought that would be the status quo well into the future. However, as NSIDC began to negotiate with the [Earth Observing System Data and Information System (EOSDIS) Snow and Ice] Distributed Active Archive Center (DAAC) for a new contract, we realized DAAC was no longer willing to pay for archivists, two librarians, nor the preservation/conservation of the physical, non-digital items owned by NSIDC. As we found ourselves trying to justify our existence, we began searching for any and all funding options to help save the archives and our positions.

The following activities are not in strict chronological order; instead, they are grouped as to type of activity: raising awareness, non-grant fund raisers, grant proposals, and funding ideas we considered but could not or did not do. They are the detours, dead ends, and pit stops from 2004 to today. The map of these activities is more impressionistic than a sharp and clear route, and its fuzzy nature symbolizes the fuzziness of ARC and NSIDC's past and future.

Activities to Raise Awareness of the Collections

During our naïve period, we knew that we needed to raise awareness of our collections both internally and externally — no one outside of our small communications group really knew what we had in the archives or library. Our first "awareness" idea was a weekly newsletter. We had a naming contest and even provided the winner a batch of homemade cookies as the prize. The newsletter, *Frost Byte,* remained a weekly online post from 2005 until 2014 when our archivist left NSIDC. For the next two years, the newsletter was issued quarterly and as of this year, I have discontinued it. As an awareness-raising tool, I believe it was moderately effective for approximately eight or nine years. Once we had to focus on grant writing and other "rescue-the-archives" activities, we had less time for this non-funding activity.

During this period of awareness-raising, we received funds for a display case. We used the case to highlight various collections in the library and archives. For a couple of years or so, we also held an open house each time we changed the display. The displays and open house events drew people into our library and archives rooms, giving us an opportunity to "sell" what we had to offer.

One of the more successful awareness activities occurred in 2008. We teamed with INSTAAR's [Institute of Arctic & Alpine Research] Information Center and conducted a scavenger hunt with book exhibits in both locations. This was a great success for educating our users and management teams.

We continued to work on raising awareness using various methods through 2011: presentations and posters about our collections at national conferences and meetings, as well as posters at the annual Cooperative Institute for Research in Environmental Sciences Rendezvous, which is an annual meeting and poster session for the Institute. Around 2008, we became aware that funding for the archives might not exist for much longer, so we made a big push with more papers and presentations in that year than in any other.

In 2009, we realized that posters and presentations were not actually helping. We had a campus-wide and city-wide open house, started a Friends Group, and set up a donation page on our website. However, we still needed to find serious money.

Non-Grant Funding Activities

Although we were actively searching for applicable grants for libraries and archives, we decided to try various other means to raise some funds as well. The most successful was and still is our Adopt-a-Glacier program. Since its launch in 2012, we have fulfilled 456 adoptions, for a total of ~$8,000 in donations. These funds may eventually help us relocate the archives collections to the University of Colorado Boulder libraries or archives for better conservation and user access.

However, this was not our first funding activity. In 2009, we held an Outdoor Gear Silent Auction. NSIDC staff donated their gently used outdoor gear: tents, hammocks, sleeping bags, etc., and on the day of the auction, people throughout the building (not just NSIDC staff) made bids for their favorite items. We managed to net about $100.

In 2011, we contacted Café Press about developing a store of items to sell through their site. We created various items and advertised them in our newsletter, on our website, and even posted a printout of the available items in the communal kitchen. However, after a first rush of purchases, the sales petered out. I believe you can still purchase a mug or coaster imprinted with photos from our collections, as well as actual prints from the glacier photographs collection, but we are not actively advertising their availability.

None of these were designed to actually support the Archives, but they did generate enough money for some special activities, supplies, more open house events, and short bursts of optimism, the most important outcome for us and our supporters.

First Grant-Funded Projects

Before we started looking for grants to fund ARC, we worked on several digitization projects funded by the NOAA-supported program, the Climate Database Modernization Program (CDMP).

The funds were dedicated to providing online access to some of our physical collections, the first of which was the Dehn Ice Charts[1] project in 2005. Under the auspices of the project, we digitized almost 7,000 ice charts of the Arctic created between 1953 and 1986 and donated to NSIDC by the estate of William H. Dehn.

Other digitization projects funded by the CDMP were the Birdseye photos[2] (~2,800), and approximately 14,000 glacier photos from our collection of USGS-donated glacier photos[3] and the Austin Post aerial photographs. The CDMP also funded the restoration and digitization of four reels of film created by the University of Colorado Department of Mountain Recreation. This film was shot during student hikes in the summers of 1938 through 1942, and provides rare historical footage of the Rocky Mountains, including Arapaho Glacier and Fair Glacier. The DVDs are still available for purchase.

By the end of the CDMP funding, we had digitized almost 25,000 physical objects. These digital images, available for download or viewing via the internet, have inspired works of art, illustrated books, and increased worldwide recognition for ARC's special collections.

Grant Proposals – Successful

As early as 2006, we were scouring various foundations and national organizations' websites for grants to help us with various projects and even with selling the value of the library and archives to upper management. Both Allaina and I searched for appropriate grants which might have a chance of success. Obviously, we were not a good fit for NSF-supported grants, which tend to support scientific research projects for short periods of time.

One of our first grant proposals was successful. In 2007, we applied for and received the General Preservation Assessment for the collections of the National Snow and Ice Data Center from the National Endowment for the Humanities. We hoped that the assessment would inform upper management of the needs and value of the archives, and be a "seed-grant" for our future endeavors. Although it did not make a big impact on either goal, it did help us in getting our collections on the University's risk management insurance and in bringing awareness of these "hidden" collections to the University's librarians.

Another successful grant awarded in 2012, Then & Now: 122 Years of Glacier Photography and Research, funded by NOAA, used the popularity of blogging to bring to life Harry F. Reid's expeditions to Glacier Bay in 1890 and 1892. The title of the blog is *Harry F. Reid: Exploring Glacier Bay.* The blog contains a transcription and digital images of the field notebooks and sketch books.

Last year, we received our most recent grant. The CU Science Libraries, in conjunction with ARC, applied for the Council on Library and Information Resources (CLIR) Digitizing Hidden Collections grant. The award was announced in December of 2015, and the project archivist starts in August this year. Our project, Revealing Our Melting Past: Toward a Digital Library of Historic Glacier Photography, will complete the digitization of our glacier photograph collection.

— And Not So Much

Over several years, we continued to search for funding options. In 2010, we applied for both the National Endowment for the Humanities' Preserving the Human Spirit of Adventure and the Polar Past, and Cataloging Hidden Special Collections and Archives offered by CLIR, neither of which we won. Most of the reviewers' comments centered on either matching funds or support from our parent institution.

In 2014, we applied for CLIR's Cataloging Hidden Special Collections and Archives grant for our project, Revealing Our Melting Past: Providing a Sustainable Future for the Roger G. Barry National Snow and Ice Data Center Archives. We planned to use the grant to support our archivist for another two years or so while she completed cataloging our archival collections. However, once again, we were not successful.

Funding Ideas Considered but Not Attempted

One of our biggest problems was trying to communicate to our managers, especially those that liaised with the major funding agency, NASA DAAC, how grant-funding in libraries and archives is totally different than the science-based grants. Science project grants are structured to fund the scientists (usually full-time), equipment, travel, other personnel, etc., and usually provide hundreds of thousands of dollars. Although libraries and archives also receive funding for specific projects, there are no grants that would support personnel permanently.

In 2012, a team of NSIDC management met with us every month to brainstorm various ideas for raising funds. One of the ideas we investigated was having an annual event such as Colorado State University's (CSU) Water Archives fund raiser called "Water Tables." This annual event raises enough money in donations to fund one full-time employee year-round.

"Water Tables" is a banquet where attendees register for the event, and part of the fee is considered a gift to the archives and is tax-deductible. They have specialists in Colorado water issues sitting at each table and a keynote speaker. During the meal, the scientists talk to their table-mates about current Colorado water initiatives and related issues. Over the years, this event has grown not only in attendance but also in reputation, and is considered an unmitigated success.

Where the CSU event focuses on water issues in Colorado, ours would have focused on the cryosphere and related sciences. We, too, would have a scientist at each table, as well as a keynote speaker. This idea, which worked so well at CSU, never got off the ground. We talked with James Balog, Arctic explorer and photographer, who has a collection of his photographs in our archives; however, we never connected with him to schedule something nor did he ever commit to speaking at any of our proposed events.

Other ideas included an active Friends of ARC group that would organize events and do fund raising similar to other libraries' friends' groups, and a 5K Run and Fund Raising event patterned on several annual events held by different groups at CU Boulder.

Why did these plans never come to fruition? Lack of support, financial or otherwise, from our director, no funding, and no one on the management team wanted to risk failure.

So, Now What?

In order to provide NSIDC management with a clear picture of what they could decide to do with the archives, Allaina created a document that explained the importance of the archives, what needed to be done to keep it viable, and provided other options if they could not do what was necessary. The one section that is still appropriate is the one that lists those options.

1. Provide interim support — Providing some level of ongoing support with specific goals to achieve traction on financial sustainability will afford the best opportunity for ARC to survive and prosper. It capitalizes on the current reputation and traction of ARC and the experience and knowledge of current staff.

2. Move the ARC collections — Moving the collections (even just some of the collections) to new archives is problematic. It would require skilled staff resources over a long period of time and may ultimately fail. Most of the resources were originally donated to ARC because there was no other repository for them. It would also shed a negative light on NSIDC's financial health and stewardship.

3. Close the doors — Attempting to keep materials here in a "dark archive" without professional staff and an archives program is an undesirable option. It closes off these materials to researchers, probably permanently, and subjects them to further neglect and deterioration. It betrays the trust put in NSIDC to steward these materials and will likely damage the Center's overall image as a trusted home for data management.

4. Digitize the collection and dispose of the original materials — This is not a responsible nor realistic solution. Originals allow staff and researchers to verify the authenticity of the data. Unaltered originals are necessary, in some cases legally necessary, to validate research. Digitization is also expensive and time-consuming and creates additional preservation issues such as media and format migration. Sometimes, you just need the original.

The DAAC contract, which pays my salary, is up for renewal in a couple of years, and my librarian position (now only 30% FTE) may dry up completely. As for the physical collections, two years ago, I was charged with developing a plan to close the doors on both the library and archives, including some options for keeping some of the library materials in a "reading room" setting. As of the last year or so, my supervisor has tabled the idea, or at least has not mentioned it. I am sure it is because we are all hoping that we will eventually find the funds to move the collections to the CU Boulder Earth Science Library, and that the CU Boulder libraries will find funds to support them.

Conclusion

I think the point of this paper is two-fold — to provide you with possible solutions for your own funding problems and to inspire you to never give up. ARC is still open for business, and we have accepted a couple of new donations to the archives in the past two years; granted they remain unprocessed and uncatalogued. In 2018, when I might reduce my hours,

management might revisit these issues. The head of the Science Libraries at CU Boulder, NSIDC's NOAA project manager, and various other people at NSIDC want to keep the collections active and available. However, one of our best hopes is to move the collections to CU Boulder under the care and supervision of the Science libraries. We will continue to try and find funding for this, while we continue to help researchers, students, faculty, and staff find the information they want and need.

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Byrd 1933: Films from the *Discovery Lecture Series*

Laura J. Kissel, Polar Curator, Byrd Polar & Climate Research Center Archival Program, The Ohio State University, USA

Abstract

In 2014, at the 25th Polar Libraries Colloquy in Cambridge, UK, I presented a paper about the grant received by the Byrd Polar and Climate Research Center Archival Program (BPCRCAP) from the National Film Preservation Foundation to preserve ten reels of film in the Richard E. Byrd Papers, titled the *Discovery Lecture Series.* These films document Byrd's second expedition to Antarctica, 1933–1935. Shot by Paramount Studios cameramen, this unprecedented visual diary is largely silent film with some short studio recreations.

The preservation work concluded in July 2014, resulting in newly created 35mm prints, negatives, and master positives, as well as digital betacam and DVD versions. The final requirement of the National Film Preservation Foundation was a public screening of the newly-preserved footage. Upon review, we found that this film consisted of some amazing, but disjointed scenes, totaling about 90 minutes. We feared it might be challenging to engage an audience in viewing the footage without some editorial work. I began working with Pamela Theodotou, the media specialist recently hired by the Byrd Polar and Climate Research Center, on a plan to present the film and make it relevant, somehow, to today's audience. Pam's film background and deep interest in the topic uniquely qualified her to reformulate this footage into a cohesive documentary feature. Through more than a year of intensive archival research, Theodotou painstakingly cataloged film clips using the scripts for Byrd's lectures, crafting a film that captures the expedition as a whole. Byrd's own voice and the environmental and animal sounds of Antarctica originally recorded by scientists on the expedition can be heard in the film, thanks to audio found in and adapted from the Papers of Admiral Richard E. Byrd.

The world premiere of *Byrd 1933* was on October 20, 2015, at Ohio State's Wexner Center for the Arts. Though the preserved footage of the *Discovery Lecture* films is now available to the public, *Byrd 1933* will only be shown in a limited number of venues over the course of 2016, allowing the film to remain eligible for entry into various film festivals over the next year.

Introduction: The Importance of the *Discovery Lecture Series*

Given the tremendous expense in preserving film, it is important to recap the importance of the *Discovery Lecture* films.

The *Discovery Lecture Series* documents Byrd's Second Expedition to Antarctica in full. Early scenes show the departure of the expedition's ships *Ruppert* and *Bear,* including life aboard the ships, as they travel from Boston through the Panama Canal and on to Dunedin, New Zealand and finally to Antarctica. In Byrd's lecture scripts, he states that not a lot of time will

be spent on the "getting there," as life in Antarctica is the really exciting part! The films do show life on board the ship for both men and dogs, including scenes of the ships in storms, as well as some beautiful images of icebergs. Maps of the route are used as graphic illustration to show the progress of the ships over time.

Once the ships arrive in Antarctica, there are many scenes devoted to unloading the supplies and setting up camp. Given that Byrd planned for a two-year expedition, an incredible amount of supplies had to be moved from the ship inland to the camp. Scenes show the men moving supplies via dogsled, including the hazards of avoiding crevasses enroute.

The *Discovery Lecture Series* next provides the viewer with an overview of daily life in the subzero environment of Antarctica, including a view of the bunks where the men slept and cooked. Expedition members are engaged in scientific studies, using microscopes and beakers, and working with radios. There are also some entertaining scenes of the "Knights of the Gray Underwear," a group formed by members of the expedition playing instruments and singing.

Finally, the *Discovery Lecture Series* documents Byrd's stay alone in the remote weather station in the interior of Antarctica, called Advance Base, and his ultimate rescue by the men. During this time, Byrd was poisoned by carbon monoxide fumes. In the lecture scripts, Byrd has minimized the event, though he would later go on to write an entire book about the experience (*Alone,* published in 1938 by G. P. Putnam's Sons). Though the lecture tour was a vehicle for Byrd to sell his books and raise money for his expeditions, throughout the lecture scripts, Byrd emphasizes the importance of the entire expedition as a team, while often minimizing his own role. In fact, in the introductory material of one script, Byrd writes, "This pictorial record will show better than any words of mine could, the sacrifices my men made and the credit they deserve."

It is believed that John L. Herrmann, a cameraman for Paramount News who accompanied the expedition, shot these films. Documentation in the Byrd Collection indicates that Herrmann won top honors for his work in filming the expedition, in the form of a fellowship in

the Royal Photographic Society of Great Britain. At the time (1935), he was the only newsreel cameraman in the United States to hold the award.

In total, there is 8875 feet of 35mm film on ten reels, both nitrate and acetate, black and white positive and negative elements.

"Finding the Film in the Stone"

So how does one prepare ten reels of largely silent film for a general audience, and keep them engaged for about an hour and half?

The filmmaker, Pam Theodotou, set out to methodically analyze each and every clip of our preserved film footage. She started working on the film immediately upon receipt of the preserved footage. This means she was engaged in this work from July 2014 until the film premiered at the Wexner Center for the Arts on October 20, 2015.

Pam methodically combed through the lecture scripts in the collection, in addition to searching Byrd's papers for anything related to these films. She likened the process to the task of a sculptor, citing this quote from Michelangelo: "Every block of stone has a statue in it and it is the task of the sculptor to discover it." Creating a film from these ten reels of footage would be a similar task. Pam needed to first become familiar with Byrd's Second Expedition to Antarctica (BAE II), so she began with overview reading (Bertrand) and other information about Byrd from our website. And, she asked a lot of questions!

Email Pam to Laura 2/8/15:

> *Do we have any indication, from the reels or the cans they were in, of dates? I think I asked you this already, but I wanted to be sure. I am realizing the scripts I am reviewing span from 1930 to 1943. They are all quite different lecture narratives, and the clips don't seem to match any of the ones I have looked at exactly. There are also a lot of versions of lecture scripts in the archives.*

My answer:

> *What we know is that they were called the "Discovery" lecture series. This is how they were labeled and organized in the collection. The cans are labeled Discovery. And we know that this was the lecturing Byrd was doing after his second expedition to Antarctica (1933–1935). I would then assume that any scripts dated before 1933 are of*

course pertaining to his first expedition (1928–1930). We know that he used some of the footage from the first expedition in subsequent lectures.

What makes sense to me, from a logical standpoint, is that with each expedition, he bulked up his lecture footage, so while he may have used the footage from the current expedition predominantly, there would be a clip here and there of previous expedition footage used to illustrate whatever it was he was trying to illustrate.

I don't think you are going to be able to sort this out quickly because of the extent of what we have — as you know, there are reams of paper to look at. I guess the question to ask at this point is the extent to which all this matters in what you need to do. I don't know the answer to that! Remember that the collection was stored in numerous places before it came to us, and things were not in good order. It may not be possible to exactly match up scripts to films.

As Pam continued to work through the documentation in the Byrd Papers, she organized the clips into a massive spreadsheet, which really served as a way to put the films into a proper order. Without a clear one-to-one script to film, this was really the only way to impose an order on all of the footage. As Pam completed the work of organizing the clips of the preserved film, we were amazed at how much of the story we were able to tell with the preserved film. Given that this series of film began with 28 reels, and ended with only ten, this was pretty incredible. However, we did have a few gaps in the story. Fortunately, we were able to fill those gaps with still images from our collection.

How Does This Film Differ from Other Similar Films?

The process of creating *Byrd 1933* not only involved putting our ten films into their proper order, but it also included effort to gain some clarity over what appeared to be similar and/or duplicate films. For example, we knew that the University of Alaska Fairbanks had some Byrd film recently donated to them by the family of Thomas Poulter, a member of Byrd's expedition and second-in-command on Byrd's second Antarctic Expedition.

Email Pam to Laura 2/9/15:

I also went back and looked at the Poulter Alaska films and there is definitely some crossover. I will compare and contrast that usage as well in the spreadsheets. I am glad I had you copy any documents that referenced Paramount and the Poulter films footage so we can unravel that mystery. I need to research who shot those "Poulter films." I suspect that either Paramount did send another small outfit with Byrd or sent a camera with him or perhaps Poulter shot them himself? Paramount, by the look of the 1933 assignment, did something of the sort. No matter who shot them, if

Paramount contracted for it the results will belong to them. Also, alternatively, I think us calling them the Poulter films may have given us the impression he shot them which may be incorrect, they may just be lecture films he ordered from Paramount in the same way Byrd did (with Byrd's blessing).

Email Pam to Laura 2/16/15:

…they are definitely cut from the same material we have but are longer sequences. I was seeing about every third scene as a cut we have in our collection of clips. You can see how it was used for a lecture and the parts that were chosen definitely are mostly about science (since Poulter was a scientist this makes sense). For instance, the seismic reflection video, we have about half of that material and the Poulter material has more scenes and more detail. The quality of the film is really quite good actually.

What I find interesting is that our film is more narrative, fast cuts, and movie-like. Byrd definitely took his lead from what he learned from the film people he knew. Poulter on the other hand requested material that was more detailed and complete like a scientist would be (and can be quite boring simply because you are watching two minutes of a field of birds for instance). I found their meteor video very cool actually. There is a lot more depiction of the actual science they were doing with telescopes and research.

We were indeed able to confirm what Pam suspected. According to Angela Schmidt, the film archivist at the University of Alaska Fairbanks, Poulter was given 35mm print copies of the BAE II footage shot by Paramount. At some point, he had these transferred to 16 mm safety film. It is the 16mm film that is held by the Alaska Film Archives.

What About the Broadcast Film *Discovery?*

How similar or different are the lecture films from the broadcast version of the same expeditionary film? Are we creating something that has already been created?

We were aware of a broadcast version of the film called *Discovery* — in fact, nine reels of 35mm nitrate film sit in the ice core freezers at the Byrd Center. At the time we applied for the NFPF grant in 2013, we considered this group of films. However, published information about the broadcast film *Discovery* is confusing at best. Documentation in the Papers of Admiral Richard E. Byrd does shed light on the fact that at least two versions of this film were produced for commercial broadcast in theaters. Yet, a search of the AFI catalog results in only one record, for a 1947 version of the film *Discovery.* It has been impossible to find firm

information in any published sources that exactly matches our copy of *Discovery.* Correspondence with the National Archives — who has a record for a film called *Discovery,* publication date questionable at 1935? — indicates that our copy is very likely the 35mm original of the 1935 version of this film. Yet, preliminary information indicates that our film may be incomplete. Given all of this uncertainty, we put our focus on the lecture series.

Uh Oh — What's This on YouTube???

Sometime after we applied for the NFPF grant in 2013, Periscope Films put a version of *Discovery* up on their YouTube channel. Upon review, we quickly realized that *Byrd 1933* stood alone as a different work of art. Pam states:

> *The emotional approach of* Discovery *is very National Geographic documentary style from the [19]40–70s. The kind we remember seeing when we were kids. It stands as a lovely piece. Byrd's voice is narrating throughout with some by a famous narrator as well.*
>
> Byrd 1933 *is actually a little longer in length. They have some footage we do not and vice versa. I mostly saw extended sequences of stuff we have that make certain sections longer with more angles. However, we seem to have in* Byrd 1933 *some things that are unique. For instance:*
>
> > *We have all the radio broadcast sequences and the Knights of the Gray Underwear.*
> >
> > *We have all of the Little America science room, the sail maker, the seal room, pemmican making, bath tub scene, men eating, Carboni cooking, mess hall, dentist, etc.*
> >
> > *We have some Advance Base sections like the men in the masks, the dried foods, Byrd cooking for the men.*
> >
> > *We have some aerial footage they do not, and vice versa.*
> >
> > *We have more shoveling snow / building footage.*
> >
> > *We have more cow footage.*
> >
> > *We have the men skiing and Demas tangled in his skis.*
> >
> > *We have more Byrd navigating in the plane.*
> >
> > *We have all the Autogyro footage.*
> >
> > *We have the exploration of the pressure ice at night.*
> >
> > *We have the seismic experiments.*

Taking all of this into consideration, we concluded that our footage was unique enough to continue with our project.

This Film Needs Sound!

Early in the process, we knew that we would need to add sound to this film to help keep our audience engaged. The only sound on the actual footage was in a couple of scenes that were obviously studio re-creations. Pam drew on the audio from the Byrd collection and added some of this as our sound track. Though the collection does not contain recordings of Byrd's actual lectures, it does contain many recordings of Byrd's voice in other settings. In addition, the collection also contains a number of recordings called, "Nature Sounds from Antarctica." Pam was able to utilize much of this audio, in addition to adding musical accompaniments.

Since we didn't have enough appropriate audio for everything, we decided that our audience may not be able to follow what was going on without the addition of some written captions carefully added throughout. Pam states:

> *I did another run through of adding written overlays and I have to say it really looks great. It is starting to feel like a diary in real time, but yet not too much of a diary because the text is used only when necessary or to serve a dramatic purpose. I am pulling about half of the written material from Byrd's words and half from my commentary made to sound factual or a little like something Byrd would say based on his writings.*

Then, only eight days before the Wexner Center premiere, I got this message from Pam:

> *I have been working on the written portions of the film and have come to a new conclusion on the content. It seemed to me that the minimalist language to support the narrative I was aiming for was so diminutive that it began to cheapen the experience. I have been reading* Alone *and it is such a beautiful[ly] written book that I am going to try and use similar phraseology from it and* Discovery *as the narrative written bits. I still want to keep it very, very short, but rather than punchy and factual it will be more crafted and the word choices more literary and poetic. I'm going to try and stay away from actual excerpts because we then perhaps get into copyright issues.*

Of course, she did make the deadline, and the Wexner Center premiere of *Byrd 1933* went off without a hitch, to an audience of just over 100 people.

25th Anniversary of the Polar Archives

The timing of the premiere was such that it fit into the larger celebration of the 25th anniversary of the Polar Archives. In addition to the film, we also had an exhibition in the Thompson Library Gallery (Thompson is our central campus main library). The exhibition ran from October 5, 2015 through January 3, 2016. In conjunction with the exhibit, we had a number of other public programs in addition to *Byrd 1933,* all designed to inform and create interest in the exhibit, as well as in any of the other related programs. Public programming activities included regularly scheduled demonstrations of glacial flow with flubber; a lecture by the Director of the Byrd Center, Ellen Mosley-Thompson, on the topic of ice cores; a public showing of *Admiral Byrd: Forged on Ice,* a recent documentary by WOSU, our campus public broadcasting affiliate; a lecture by Terry Tickhill Terrell, one of the women who comprised the first all-woman research team to Antarctica; and a panel discussion regarding COP21, the UN Conference on Climate Change.

Going Forward

Though we will eventually release the compiled film publically we are currently only showing it in a few limited venues. This is so that we maintain eligibility to enter the film into a few selected film festivals.

I would conclude by stating that this project took me in a direction that is quite different than what is typically my role; usually I help researchers find the primary resources they need, and they create the book, or the movie, or the finished project, whatever that may be. In this case, I was far more involved in the creative process. But it was really Pam who was the creative vision behind this project. In the end, I believe we created a film that is true to *Discovery* and Admiral Byrd's vision.

Additional Notes

A little bit about Pam. Here's the introduction we used for the premiere at the Wexner Center: *Pam Theodotou, the director of the film is an artist and filmmaker, with a B.S. in biology, a law degree, and an M.F.A. in Cinema Arts. She is the media specialist for the Byrd Polar and Climate Research Center. As a filmmaker she works through her own production company, NYXFILM, doing documentary and feature film projects. She has been working*

with Laura Kissel, the Byrd Papers Archivist, for the past two years researching and editing the film you are about to see.

Copyright questions/answers: Pam is also an attorney — beneficial in sorting out the legal language and copyright issues.

History of the Elmer E. Rasmuson Library and Its Rare Books Collection

Ulyana Koratkova, Alaska and Polar Regions Collections & Archives, Rasmuson Library, University of Alaska Fairbanks, USA

The Elmer E. Rasmuson Library rare books collection began as a part of the library at the Alaska Agricultural College and School of Mines (University of Alaska). Charles Bunnell, the first University president, who served from 1921 to 1949, wrote solicitation letters to potential donors asking for books. W. F. Thompson, *Fairbanks Daily News-Miner* editor, made the first donation of ten volumes of *The Library of Original Sources.*[1] *The Library* volumes, bound in black and marked with W. F. Thompson's book plates, still reside in the Rasmuson Library's public access area. In Washington, DC, Bunnell obtained books from several senators, and he received 250 government publications from Alaska Delegate Dan Sutherland.[2] The early gifts included Woodrow Wilson's *History of the American People* inscribed with a note, "To the Alaska Agricultural College and School of Mines, with the best wishes of Woodrow Wilson 1922."[3] Various government agencies, such as the US Coast and Geodetic Survey, US Geological Survey, and Alaska Road Commission, sent their publications. The University of Washington donated duplications within its holdings, including Bancroft's *History of the United States.* The Alaska Historical Association in Juneau responded to Bunnell's solicitation with its duplicate books and geological bulletins.[4] The Hudson Stuck Memorial Hospital in Fort Yukon mailed a few of Archdeacon Hudson Stuck's books found in storage.[5] In spite of his early success, however, Bunnell did not secure large collections of rare Alaskana.[6]

In 1922, according to the *Alaska Agricultural College and School of Mines Bulletin,* the library location was on the first floor of the Main College Building.[7] When LaVerne Borell, Bunnell's secretary and de facto librarian, arrived at the Alaska Agricultural College in 1922, she found books piled outside the library-designated two rooms of the Main Building, and no library shelving or furniture anywhere in sight.[8] The next year, the library held 3,500 volumes, 3,400 pamphlets and bulletins, and 65 periodicals and magazines. Designated as a required depository for government publications, the library received selected documents, and Alaska publishers submitted nearly all papers published in Alaska.[9] By 1925, equipped with shelves and provided with reading areas, the library held at least 5,000 volumes.

"More than five thousand volumes stand on the shelves of the College library guarding beneath covers of red or blue or green the 'wisdom dark or clear' of many men, many minds," wrote Leslie Marchand, Alaska Agricultural College Professor of English and French, in 1925.[10] "How quietly the knowledge of the world and the thoughts of men rest in the bosom of a library, the peace of calm and mellowed wisdom standing side by side with shouting enthusiasm and delectable adventure. But, like men, books have a character and an individuality that is displayed in dress and visible form."[11]

In his comprehensive essay, "Among the Five Thousand," Marchand described as many as 57 book titles, from *Twenty-Four Little French Dinners* to Galsworthy's *Forsyte Saga.*[12] This 1925 *Farthest-North Collegian* essay, structured as a tour, permits a historical reconstruction of the earliest College library. Most titles and authors listed by Marchand remain in the Rasmuson Library today.[13]

In 1935, the same year the Alaska Agricultural College became the University of Alaska, the books moved to a new library on top of the college's one-story gymnasium. By the 1940s, Dr. Bunnell needed a locked Alaskana room to protect the most valuable volumes. In 1944, the University built three temporary offices, two of which constituted storage for older Alaskana materials.[14] The *Farthest-North Collegian,* an early college publication, lauded the growth of the university library in a 1944 article, "The library has moved from the old Main Building into new quarters covering the entire top floor of the gymnasium and the five thousand volumes of June, 1925, have grown to the twenty-three thousand of November, 1944."[15]

Meanwhile, donations continued to arrive. In 1929, Mrs. Alfred H. Brooks, wife of the USGS geologist who spent many years in Alaska, donated his library to the Alaska Agricultural College and School of Mines. This was the first substantial donation. The Brooks Library, the arrival of which President Bunnell announced during the 1929 commencement ceremony, consisted of 2,250 volumes, 4,000 pamphlets, and a number of maps, and amounted to over $6,000 in value.[16] The donor's request for a new fire-proof library to house this collection gave a new impetus to the library.[17] Books from the Brooks Library that reside inside the Elmer E. Rasmuson Library, such as Capps' and Johnson's *The Ellamar District, Alaska* with a preface

written by Brooks, can be identified by their University of Alaska Library Brooks Collection bookplates.[18]

In 1936–1937, the closing Sitka Agricultural Experiment Station sent its collection of over 1,500 volumes, assembled from its beginning to 1930.[19] The 1944–1945 *University Catalogue* lists the Frederick Mears collection of over 300 engineering and military books.[20] A 1949 issue of *Farthest-North Collegian* featured President Charles Bunnell thanking Byron Gillam for "presenting the University of Alaska with a collection of 63 rare documents and books all dealing with the early history of the Territory." The collection included reports and a US Senate document from the time of Alaska's purchase, the first agricultural report on Alaska issued in 1869, the correspondence of Capt. L. A. Beardslee, federal authority in Alaska for several years after the purchase, and 18 copies of *Harper's Weekly* on the early days of the Klondike.[21]

In 1951, D. E. Skinner, son of Gilbert W. Skinner (president of the Alaska Steamship Company and the owner of the Erskine[22] collection), offered another valuable donation.[23] The Skinner collection that arrived at the University of Alaska library in 1951[24] served as the Alaskana nucleus with its 3,600 items.[25] Books that belonged to the Skinner collection bear the abbreviation for Skinner, SKNR, in their call numbers. According to Marvin Falk, by 1963, the University of Alaska library held 78,000 volumes in all fields.[26] The *University of Alaska Bulletin* that counted only hard-cover books provided a more conservative number of 50,000 volumes in 1961.

The bulging library collections required additional space, again and again. In 1959–1960, the University of Alaska Library moved into the Bunnell Building.[27] It became more scholastic, offering 1,500 periodical subscriptions, Russian-American Company microfilms, an enlarged government documents repository, and interlibrary loan services.[28] By the mid-1960s, the overcrowded library could no longer accommodate its government documents and stored them off-site.[29] In 1965, librarians Paul McCarthy and Ted Ryberg established the archives in one of the Bunnell Building's rooms.[30]

In 1970, a new University of Alaska library building, dedicated to Elmer E. Rasmuson, a prominent Alaskan philanthropist and banker, opened with 219,000 volumes on its shelves.[31] Elmer Edwin Rasmuson, a multi-faceted personality, chaired the National Bank of Alaska (NBA), participated in politics, charities, and various forms of public service, and had been a member of the University of Alaska Board of Regents for 19 years. Born in Yakutat in 1909 to the Swedish immigrants and missionaries Edward Anton and Jenny Olson Rasmuson, he attended public schools in Juneau and Skagway. In 1930, Elmer Rasmuson graduated from Harvard University magna cum laude.[32] He believed that every community must sustain top-notch libraries and museums. "My most prized lifetime recognition," he wrote in his memoir published in 2000, "is that my name is on the building which houses the main library at the University of Alaska in Fairbanks."[33] The library comprised one portion of an expansive new Fine Arts Complex. University of Alaska historian Terrence Cole writes, "Completed in 1970 at a total cost of nearly eleven million dollars, this complex of four buildings — including the library, a music building, an art building, and a theatre building — totaled more than a quarter of a million square feet. The new five-floor library…could hold two acres of books."[34]

In 1981, Elmer Rasmuson and the National Bank of Alaska donated the first great collection of rare books and maps to the Rasmuson Library. The NBA rare books collection became the core of the Elmer E. Rasmuson Library rare books collection.[35] This $250,000 contribution of rare books[36] led to construction of the library's rare books vault in the 1980s. The donation that consisted of 430 items, many one-of-a-kind,[37] included the first edition of Sarychev's *Atlas of the Northern Part of the Pacific Ocean,* printed in St. Petersburg, Russia, in 1826,[38] as well as other Russian-language materials from before Alaska's purchase. The collection originated in the personal libraries of Valerian Lada-Mocarski and George Davidson. The George Davidson Collection of maps and charts comprised 19 percent of the entire donation, and consisted of 82 maps.[39]

To manage its Alaska and Arctic-related holdings, the library created the position of Arctic bibliographer. Charles H. Parr, a retired US Army major who earned two degrees from the University of Alaska, and who had a working knowledge of Russian and German, accepted the position. Between 1970 and 1974, he focused on working with the existing Skinner collection

and on building the Alaska and Polar Regions Collections.[40] *Preliminary List of Early Alaskan Imprints, 1869 through 1913,* a bibliography that he published in 1974, remains a valuable source of Alaska holdings of printed materials up to 1913.[41] In 1983–1985, with the construction of a $13.2 million addition,[42] the evolution of the original two library rooms in the Main Building of the Alaska Agricultural College culminated in a full capacity academic library.

In 1982, the library created the position of curator of rare books and appointed Professor Marvin Falk, the library's Arctic bibliographer, to the position.[43] Marvin Falk, educated at the University of Minnesota (B.A. in History and English), University of Massachusetts (M.A. in History), and the University of Iowa (Ph.D. in History), published three bibliographies: *Alaskan Maps: A Cartobibliography of Alaska to 1900* (Garland, 1983); *Alaska* (CLIO Press, 1995); and *Alaska History: An Annotated Bibliography* (Praeger, 2006). He edits the Rasmuson Library Historical Translation Series, which seeks to make available in English rare or difficult-to-obtain scholarly material on Alaska. Authors of the Series use rare books and materials found in the library's collections, such as Gerhard Friedrich Müller's *Voyages from Asia to America, for Completing the Discoveries of the North West Coast of America,* published in London in 1761 and 1764.[44] Series volume 17, Alexey Postnikov's *Exploring and Mapping Alaska: The Russian America Era, 1741–1867,* was released by the University of Alaska Press in June 2015.

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3. Cashen, *Farthest North College President*, 141; Woodrow Wilson, *A History of the American People* (New York: Harper & Brothers, 1918). EERL call number is A0335 RARE V.1.

4. Dr. Charles E. Bunnell Papers, Alaska and Polar Regions Collections, Elmer E. Rasmuson Library, University of Alaska Fairbanks. See: folders 205–212 (Library Acquisitions) in box 11 (Correspondence 1922/56, Lee – M. General).

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11. Leslie A. Marchand, "Among the Five Thousand," *Farthest-North Collegian* 3, no. 3 (June, 1925): 20.

12. Marchand, "Among the Five Thousand," 20–22.

13. See Appendix C for Marchand's article; see Appendix D for Alaska Agricultural College and School of Mines library books listed by Leslie Marchand

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15. "Collegians Filled with Rare Books," 8.

16. William R. Cashen, *Farthest North College President* (Fairbanks: University of Alaska Fairbanks, 1972), 204.

17. Alaska Agricultural College and School of Mines, *Catalogue* no. 7 (College: Alaska Agricultural College and School of Mines, 1929), 12.

18. S. R. Capps and B. L. Johnson, *The Ellamar District, Alaska* (Washington, DC: Government Printing Office, 1915).

19. University of Alaska, *University of Alaska Bulletin: General Catalogue 1937–1938* (College: University of Alaska, 1937), 12–13.

20. University of Alaska, *University of Alaska Bulletin: General Catalogue 1944–1945* (College: University of Alaska, 1944), 11.

21. "Rare Collection Being Given to Dr. Bunnell," *Farthest-North Collegian* 29 (27), no. 10 (11) (Aug. 1949): 8.

22. The Erskine collection belonged to Wilbur Julian Erskine who gathered Alaska Commercial Company records and other early Alaskana (see: Alaska and Polar Regions Collections & Archives, the Wilson Fiske Erskine Papers). Wilbur J. Erskine began his business career as a purser for the Alaska Commercial Company's steamship *Portland*. He purchased his own station in Kodiak in 1913, turned it into a prosperous mercantile company, and maintained it until his death in 1948.

23. Marvin W. Falk, "The Alaska and Polar Regions Collection at the Elmer E. Rasmuson Library," *Alaska Journal* 9, no. 1 (Winter 1979): 66.

24. Falk, "The Alaska and Polar Regions Collection," 66.

25. "The University of Alaska, Fairbanks — 'America's Farthest North Major University,'" *Summer Sessions 1976, University of Alaska Fairbanks* in *Fairbanks Daily News-Miner* (May 22, 1976): 13; "UA Arctic Bibliography One of Best," *Week-ender* in *Fairbanks Daily News-Miner* (Apr. 2, 1977): B11.

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A Roadmap to Navigate the Range of Polar Libraries, Databases, and Archives Now Available Online

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Abstract

An introduction to the plethora of international libraries, databases, and archives for polar information which are currently available online. The paper will discuss how members of the polar community can better discover, access, and use these resources, as well as how these resources can be linked. The paper draws on a brief survey which was sent out prior to the 2016 Polar Libraries Colloquy. The survey was sent out through the Colloquy's mailing list to ensure member resources are highlighted. To attract non-member responses, the survey was posted on Twitter and members were asked to forward the survey to colleagues.

1. Introduction

Research in the Polar Regions continues to increase. In particular, scientific output in polar research has increased rapidly even compared to science in general, quadrupling rather than doubling over the period 1981–2007 as measured by refereed publications.[1] Such a steep

rise in research outputs challenges the ability of libraries to continue to acquire, manage, and make available polar information in a timely and cost effective way. The Library of the Scott Polar Research Institute and the Data and Information Service at the Arctic Institute of North America are both, through planning cycles and grant applications, seeking to adopt a more strategic approach to the management of polar information resources than hitherto, in response to this challenge. Our approach recognises the increasing opportunities for sharing and exploiting digital resources in particular. This paper draws on our recent planning processes and is also informed by a questionnaire survey of polar libraries. Our intention is to describe, document, and share the present levels of support available through libraries, databases, and archives to researchers interested in studying the Polar Regions. In this way, the paper seeks to offer a roadmap to help us navigate a complex array of resources.

To ensure we were representing polar library services adequately and in trying to document the current landscape of polar resources, the authors developed a questionnaire survey which was sent out in June 2016 through the Pollib-L discussion list and posted on Twitter, just prior to the 26th Polar Libraries Colloquy. The survey sought to elicit data on the mandate, scope, and range of collections available in the polar libraries, databases, and archives now available. The survey included questions designed to uncover the extent to which library catalogues are available online, the availability of other digital items online, and the types of materials respondents would like to see made digitally available. Final questions aimed to identify the most important bibliographic databases for researching the Polar Regions and to uncover the level of engagement of organisations with the Colloquy and with the directory of Polar Libraries and Archives. The list of questions used can be found in Appendix 1.

2. Methodology

A series of ten questions were brainstormed by the authors, the aim being to be able to ascertain the required data whilst ensuring the questionnaire could be completed by respondents within three minutes. A draft of the survey was then sent to the Polar Libraries Colloquy Steering Committee for review and edited for content. The survey was transcribed into *Survey Monkey* software and a pilot was undertaken to test the comprehension and effectiveness of the survey questions. Some 32 organisations responded to the survey from

across the world: United States (13), Canada (8), Denmark (2), Finland (Lapland) (2), Germany (2), UK (2), New Zealand (1), Norway (Svalbard) (1), and Argentina (1).

Not all questions were obligatory: nine respondents skipped the question on ranking databases and 12 did not list any items they would like to see digitised. Those questions which invited further comments attracted some 133 free text comments which have further informed this paper.

3. Results

3.1 Mandate and scope

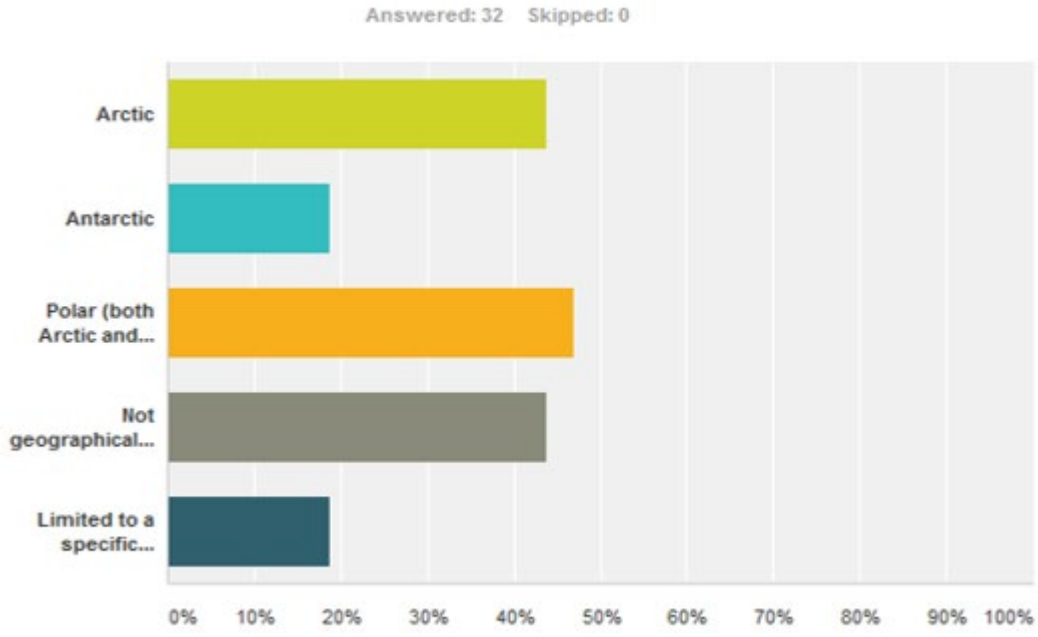

Table 1. *Mandate and scope of polar libraries.*

Our libraries cover a broad cross section of remits. Some libraries make available information on both Arctic and Antarctic regions, some only cover the North or South Poles, or are limited in a more specific way (e.g., a smaller region such as Alaska or a specific community such as Inuit communities), and some libraries are not limited geographically but include polar materials. These results suggest it is difficult to generalise about regional libraries since their scopes are diverse.

3.2 Our Collections

Polar libraries store and make available a vast array of scholarly materials in many formats: books, maps, journals, government reports, archival documents, dissertations and theses, research data, photographs, films, artworks, artefacts, and biological specimens were all commonly held by a number of institutions responding to the survey (see Table 2 below). Interestingly, although books were the most commonly occurring items, not all respondents held books in their libraries / information centres.

Other forms of materials held included: case citators, legal CDs, court decisions, videocassettes, CD-ROMs, DVDs, moving image media from films, curriculum kits, and postcards.

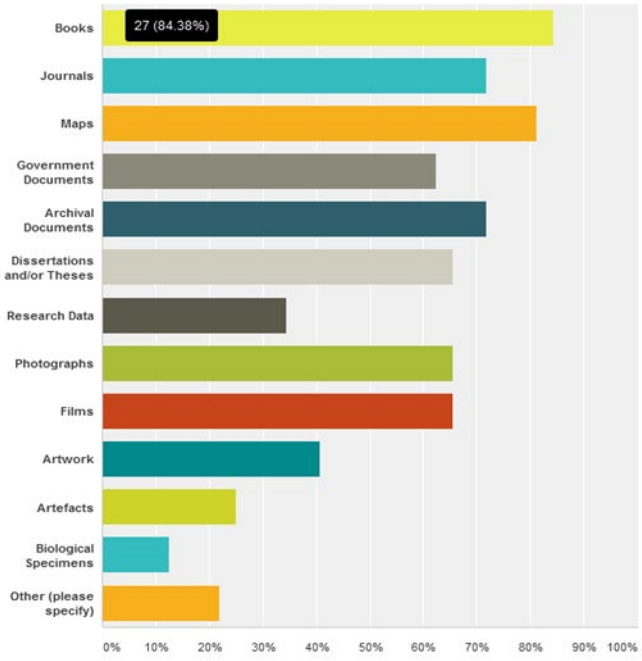

Table 2. *Range of polar libraries' collections.*

3.3 Polar Libraries Today

Almost all polar libraries today have a web presence. Survey results showed that 96% of libraries have their catalogue online allowing patrons to check holdings in the collection remotely. From comments, it is clear that some of the catalogues do not necessarily index all materials held in the libraries' collections.

Seventy percent of libraries responding to the survey have other digital projects online. Some examples of these are:

- *Project Jukebox* – the digital branch of the University of Alaska Fairbanks Oral History program which contains some 50 oral histories organised by themes.
- *L'Apparition du nord* – an interactive digital map developed by Université Laval from the polar map,*Septentrionalium terrarum descriptio* (1595).
- *Lapin Kulttuuri Kuvina* – Lapland culture in pictures is a collaboration between eight Lapland institutions: Provincial Museum of Lapland; Rovaniemi Art Museum; Tornio River Valley Provincial Museum; Gold Museum; Rovaniemi City Library; Tornio Town Library; Pello Municipal Library; and the University of Lapland.
- *Katiqsugat: Inuit Early Learning Resources* – a digital library collection of Inuit-specific early childhood education materials to support knowledge exchange between Inuit communities and provide better access to information about Inuit early childhood development, child rearing, and parenting practices.

Although the previous section identifies that the monograph is a mainstay of most of our collections, it also shows the wide array of other information types held. To some extent, this wide collection of material types and formats may be a response to the changing set of user expectations driven by the today's students, described by Prensky[2] as Digital Natives. These consumers of information offer new challenges for libraries such as ensuring that print resources are easily discoverable (or not overlooked), particularly by such users practised in a superficial information-seeking behaviour. In this respect, some librarians such as Perret[3] propose the need to teach monograph literacy to ensure that books are exploited more fully. However, a more critical challenge in terms of this paper is how to make library content (either born digital or converted from paper) fully available online as demanded by an increasing number of today's polar researchers. Some of the projects highlighted above may offer useful insights and best practices as we move to a more digital future.

3.4 Our Digital Future

The survey sought to uncover what information polar libraries would wish to digitise and make available. With hindsight, we may have sought more background information on the significance of these items and why they were chosen. Items listed were either generic types of documents (e.g., archival documents) or specific examples of a type of document such as Byrd's diary for 1925. These are listed in the two tables below:

Generic digital projects
Archival documents
Archival photographs
Books / Rare books
Court decisions / Field notebooks
Grey literature (including theses) on the High Arctic
Maps x4
Movies, Videos, Arctic film collection
Music
Photographs and Postcards
Reels of audio
Theses
Whaling ships logs

Specific digital projects
Tabled Documents from 1st through 3rd Assemblies
Alaska Review collection – raw footage from 1970/80s television news program
[James] Wordie collection of books
Photos and papers of the First German South Polar Expedition 1901–1903
Personnel information in the Byrd Papers
Maps and written reports from exploration of Polar Regions in general and Svalbard in particular
Grey literature (including theses) on the High Arctic
Alfred Wegener papers
Entire run of the *Polar Record*
Letter from Lady Franklin
Videocassettes from the Office of the Interim Commissioner of Nunavut (pre-division of the Territories)
William O. Field collection – early films of glacier research and travel
Photo collection of Karl Gripp from Greenland and Svalbard (1925–1939)
A searchable index for Nunavut Hansard, 1999–present (does not exist in any form)

Specific digital projects
Machetanz collection – Alaska statehood era films
Byrd's diary 1925
Gino Watkins fund reports
Wilkins' *Nautilus* film
Aerial photographs etc., covering the High Arctic
Carl Koldewey papers
Arctic film collection
Holdings of the Biologische Anstalt Helgoland
Old data locked up in printed occasional papers
Watercolours of J. Dewey Soper

These represent a diverse range of research materials offering a wealth of potential digital projects should appropriate business cases be made.

3.5 Bibliographic Databases

A significant number of well-established bibliographic databases contribute to resource discovery in the Polar Regions. The most commonly used databases in the authors' institutions were itemised in the survey for ranking by respondents. Arctic and Antarctic Regions database and Web of Science were typically ranked first. However, the attempt to rank a listing of databases did not prove effective — free text comments indicated that more than ten of the respondents do not use many, or any, of these databases. Thus, whilst these databases of predominantly scientific information are important to some respondents, other research libraries rely on a different set of information sources. These are listed in Appendix 3. Readers may wish to evaluate these resources and add some to their research guides as appropriate.

4. Linking Resources

With the proliferation of electronic resources, the need for libraries to support researchers and students with sophisticated, informative, and effective electronic guides to the literature has become a key activity for librarians in research libraries, not least as a means of seeking a return on investment on what are often expensive electronic resources. The *LibGuides* software marketed by Springshare has been commonly adopted across many academic and research libraries worldwide. This software can be used as part of an institution's content

management system. With suitable usability testing, this software offers librarians easy updating in the web environment and helps us to create pathfinders to reach out to patrons online.[4] When implemented, this software is most commonly labelled "research guides" to adequately describe their purpose.[5]

Research guides are increasingly being adopted across polar libraries. In addition to those Research guides recently developed at the authors' institutions of Scott Polar Research Institute[6] and the Arctic Institute of North America[7], there are other notable examples at Dartmouth College[8] and University of Lapland.[9]

5. Discovering and Sharing Resources

In a period of economic global downturn, it is particularly critical that libraries make their resources as widely accessible as possible. The Polar Libraries Colloquy community has already created a key tool to help make polar resources more widely discoverable. The Polar Directory is hosted at the Scott Polar Research Institute and lists polar libraries, museums, and organisations across 24 countries. Members of the Colloquy are urged to check their entries and confirm they are up-to-date to ensure that this resource continues to be effective.

It is through collaboration — sharing ideas and resources — that members of the polar information community can work to attract funding and continue to develop digital resources.

6. Conclusion

Our intention in this paper has been to describe, document, and share the present levels of support available through libraries, databases, and archives, to researchers interested in studying the Polar Regions. Results of the survey demonstrate that most libraries and information centers have online catalogues and an established web presence. The challenge of providing a much larger range of scientific and cultural digital resources may require us to collaborate more widely in order to obtain funding for the digitization of resources.

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7. Arctic Institute of North America Collection – Northern Studies http://libguides.ucalgary.ca/guides/north

8. Dartmouth College – Polar Studies http://researchguides.dartmouth.edu/polar_studies

9. University of Lapland Arctic and Antarctic Information http://libguides.ulapland.fi/c.php?g=130928&p=855560

Appendices

Appendix 1: Survey Questions

1. What is the name of your Polar Library or Archive?
2. Please provide the URLs for your library, catalogue, and any other digital projects.
3. What is the mandate and/or scope of your organisation?
4. What kind of materials do you have in your collection? Books, journals, maps, photographs, film, government documents, journals, theses, research data, artwork, artifacts, other. Check all that apply.
5. Is your catalogue available online?
6. Do you have any other digital items available online? If yes, explain.
7. What are your top 3 non-digital holdings that you would like to see made digitally available?
8. Please rank the electronic resources below in order of importance (1=high)

Database	Ranking
Arctic & Antarctic Regions database	
Scopus	
Web of Science	
ASFA	
GeoRef	
GEOBASE	
International Polar Year database	
Cold Regions Bibliography	
Other 1 please name	
Other 2 please name	
Other 3 please name	

9. Are you currently a member of the Polar Libraries Colloquy?
10. Have you updated your institution information in the PLC Directory?

Appendix 2: Respondents

1. Documentation Center, Secretariat of the Antarctic Treaty
2. Nunavut Legislative Library, Legislative Assembly of Nunavut
3. Library, National Institute of Water & Atmospheric Research (NIWA), Ltd.
4. Alaska Film Archives, Alaska and Polar Regions Collections & Archives, Rasmuson Library, University of Alaska Fairbanks
5. Alaska and Polar Regions book and map collections, Elmer E. Rasmuson Library, University of Alaska Fairbanks
6. Alaska Medical Library, University of Alaska Anchorage
7. Right now, we are going by Inuit Tapiriit Kanatami library (we're working towards a public opening for next summer and haven't yet decided on a name).
8. Nunavut Public Library Services
9. Alaska and Polar Regions Collections & Archives, Elmer E. Rasmuson Library, University of Alaska Fairbanks
10. National Marine Mammal Laboratory Library, Alaska Fisheries Science Center, National Marine Fisheries Service, National Oceanic and Atmospheric Administration, US Department of Commerce
11. Goldthwait Polar Library, Byrd Polar and Climate Research Center, The Ohio State University
12. Lapponica, Northern Information Service
13. Polar Collection, National Library of Scotland
14. Oral History Collection/Project Jukebox, Elmer E. Rasmuson Library, University of Alaska Fairbanks
15. Arctic Institute of North America Collection, University of Calgary
16. Roger G. Barry Archives and Resource Center, National Snow and Ice Data Center, University of Colorado Boulder
17. Geographische Zentralbibliothek, Leibniz-Institut für Länderkunde Central Geographical Library, Leibniz Institute for Regional Geography
18. Scott Polar Research Institute, University of Cambridge
19. Bibliothèque l'Université Laval
20. Archives and Special Collections, UAA/APU Consortium Library, University of Alaska Anchorage

21. Byrd Polar and Climate Research Center Archival Program, The Ohio State University
22. Lapland University, Consortium Library, Rovaniemi, Finland
23. The University Centre in Svalbard (UNIS) Library
24. Archive of German Polar Research (AGPR), Alfred Wegener Institut, Helmholtz Centre of Polar and Marine Research
25. Danish Arctic Institute
26. Polar Library Department of Eskimology and Arctic Studies, University of Copenhagen
27. UAA/APU Consortium Library, University of Alaska Anchorage
28. The Antarctic Circle
29. Institute of Arctic and Alpine Research Library, University of Colorado Boulder
30. Arctic Institute of North America, University of Calgary
31. Nunavut Court of Justice Law Library, Nunavut Courts
32. Northern Reference Collection, Pond Inlet Archives

Appendix 3: Databases and Other Resources

TITLE	URL
Alaska Film Archives	https://www.youtube.com/user/alaskafilmarchives
Alaska's Digital Archives	http://vilda.alaska.edu/
Alfred Wegener Institut - Helmholtz - Zentrum für Polar und Meeresforschung	https://www.awi.de/fileadmin/user_upload/AWI/Ueber_uns/Service/Archiv_fuer_deutsche_Polarforschung/Chronik_Druckf_6_CS.pdf
Alfred Wegener Institut - Reports on Polar and Marine Research (Berichte zur Polar und Meeresforschung)	https://www.awi.de/en/about-us/publications/reports-on-polar-and-marine-research.html
Antarctic Circle: historical, literary, bibliographical, artistic, and cultural aspects of Antarctica and the South Polar regions	www.antarctic-circle.org
Antarctic Treaty glossary	http://glossary.ats.aq/glosario/index.php?v=GLOSS_EN
Archivportal-D	https://www.archivportal-d.de/
Arctic Connect	www.arcticconnect.org
Arctic Health - information portal on health and well-being for people of northern latitudes	http://arctichealth.nlm.nih.gov/
Arctic Institute of North America Photographic Archives	http://contentdm.ucalgary.ca/cdm/landingpage/collection/aina
Arctic Institute's Photography, Art and Object, and Map and Audio Collection	http://www.arktiskebilleder.dk/pages/home.php
Arctic Portal	http://arcticportal.org
Autochtonia database (First Nations database)	http://www.reseaudialog.ca/fr/outils/banque-documentaire-autochtonia/
AWI Libraries' catalogue	https://www.awi.de/en/about-us/service/library.html
British Library	http://www.bl.uk/
Culture Pictures of Lapland	http://lapinkavijat.rovaniemi.fi
Denecrafts Digital Collections	https://digitalcollections.ucalgary.ca/
GBV Catalogue	https://en.gbv.de/informations/Verbund-en

TITLE	URL
Government of Canada catalogue	http://publications.gc.ca/site/eng/ourCatalogue.html
Harry F Reid: Exploring Glacier Bay	http://harryfieldingreid.blogspot.com/
Hudson's Bay Company Archives	http://www.gov.mb.ca/chc/archives/hbca/
International Journal of Circumpolar Health	http://www.circumpolarhealthjournal.net/
Inuit early learning resources	http://katiqsugat.itk.ca/
Inuit Qaujisarvingat: Inuit Knowledge Centre	http://www.inuitknowledge.ca/
Études Inuit Studies (available via Érudit)	https://etudinuit.erudit.org/
La plateforme Web *L'Apparition du nord selon,* Gérard Mercator - interactive map based on *Septentrionalium terrarum descriptio* (1595)	http://mercator.bibl.ulaval.ca/
National Centre for Truth and Reconciliation Archives	http://nctr.ca/map.php
National Library of Scotland, Geography & Exploration	https://www.nls.uk/learning-zone/geography-and-exploration/
National Snow and Ice Data Center – Adopt-a-Glacier	http://nsidc.org/arc/adopt-a-glacier/index.html
Natural Resources Canada Geographical Names	http://www.nrcan.gc.ca/earth-sciences/geography/place-names/10786
Natural Resources Canada Publications and Reports	http://www.nrcan.gc.ca/publications/1138
NOAA Library and Information Network Catalog	http://www.lib.noaa.gov/uhtbin/webcat
Norwegian library catalogues	http://npolar.oria.no
Ohio State University, Byrd Polar and Climate Research Center Archival Program	https://library.osu.edu/polararchives
Ohio State University, Byrd Polar and Climate Research Center, Archival Program - collections	https://library.osu.edu/polararchives/explore

TITLE	URL
Omeka Alaska Archives - virtual tour of Alaska, featuring images and documents representing locations around the state	http://consortiumlibrary.org/archives/omeka/exhibits
Pangaea database	https://www.pangaea.de/
RV *Polarstern* - glimpses of its history	http://www.awi.de/en/expedition/ships/polarstern/artikel/chronicle.html
SPRI - Polar Studies Research Guide	http://libguides.cam.ac.uk/polar_studies
Subito document delivery	https://www.subito-doc.de/?lang=en
UAF Digital Branch of the University of Alaska Fairbanks Oral History Program	www.jukebox.uaf.edu
UAF Elmer E. Rasmuson Library Digital Collections - the most memorable scenes	http://library.uaf.edu/expart/
UAF Elmer E. Rasmuson Library - International Map Collectors Society Symposium	http://library.uaf.edu/imcs-symposium-2013
UAF Elmer E. Rasmuson Library - Alaska & Polar Regions Digital Collections & Exhibits	http://library.uaf.edu/apr-collections
University of Alaska Anchorage - Consortium Library	https://consortiumlibrary.org//about/collections_partners.php
University of Alaska Institutional Repository	https://scholarworks.alaska.edu/
University of Lapland - LibGuides	http://libguides.ulapland.fi/c.php?g=208405educational resource, more in Finnish)
WorldCat	https://www.worldcat.org/

Mapping Change with Finna in an Arctic Research Joint Library (paper not listed in program)

Susanna Parikka, Lapland University Consortium Library, University of Lapland, Rovaniemi, Finland

The aim of this presentation is to present Finna, a Finnish national site for searching the freely available material provided by Finnish memory organisations. Finna will be presented and then discussed from an Arctic joint research library's point of view.

The global information scene is in constant change. The situation is the same in Finland, too, the small country with 5.2 million people and 39 institutions of higher education (HEI). Fifteen of them are universities and 24 are universities of applied sciences (UAS). Structural reforms and economic pressures will affect the higher education institutions and their libraries, too. Luckily research libraries — as well as all types of libraries in Finland — have a long tradition in cooperation that will generate tools for mapping and mastering change, and finding new ways of doing things together. One of the new national forms of cooperation for mapping change is Finna.

1. Presentation of Finna

Finna is part of the Finnish National Digital Library (NDL) project of the Finnish Ministry of Education and Culture. Finna collects the freely available material provided by Finnish libraries, museums, and archives — memory organisations.

The National Library of Finland bears the main responsibility for developing and maintaining Finna, but the actual development work is carried out together with memory organisations participating in Finna. Finna will be developed gradually as new organisations join the service. The first official version was launched in October 2013.

This Finnish national site, *Finna.fi,* provides free access to contents from Finnish libraries, museums, and archives. There are already more than 100 organisations in Finna — the expected number is 400. More than 30 of these 100 organisations are research libraries. In total, there are more than 11 million entries and more than 1.3 million records available in Finna (2016).

On the one hand it is a portal service like Europeana or Digital Public Library of America; on the other hand, it also has service functions for library patrons such as reserving material or renewing loans.

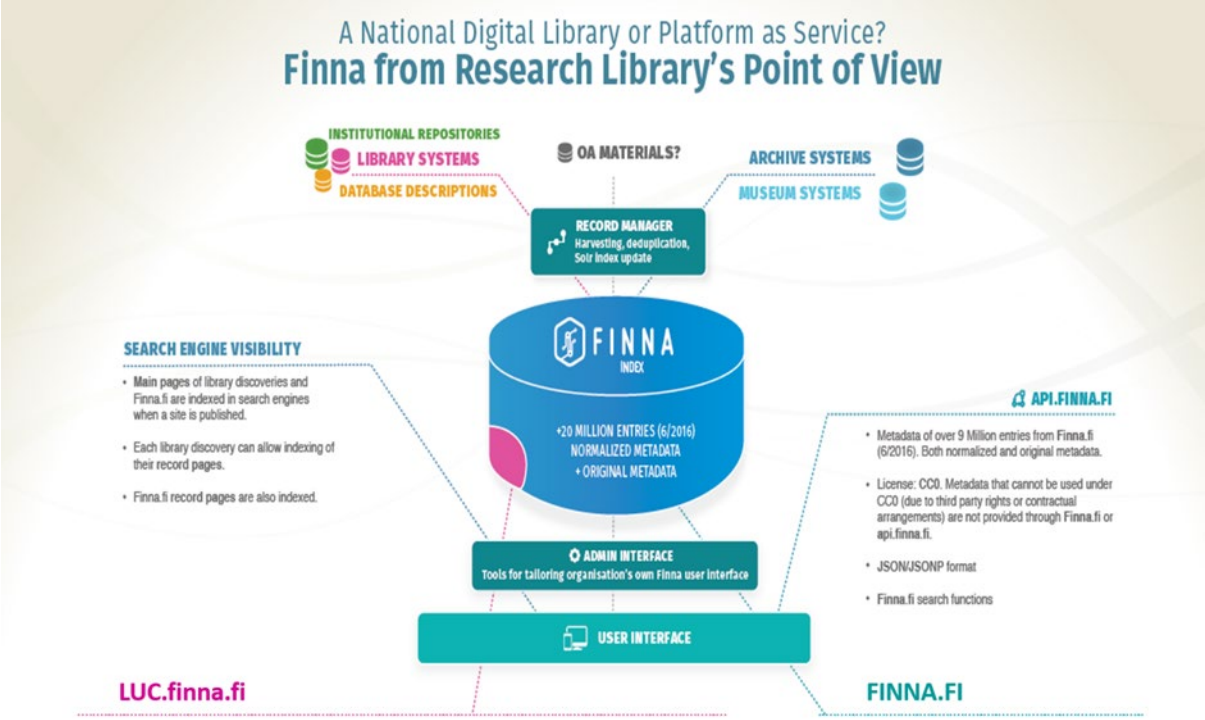
Finna is a one-stop service for delivery. The open source software used for Finna enables unlimited and easy integration of external services, ebooks, and ejournals subscribed by the library. For library users it is possible to browse and read materials available on the web. Also renewing loans and reserving materials from different libraries in one place is possible.

Finna is also a one-stop service for discovery. All library resources are discoverable in the same user interface with single search. And Finna is also a service for reference management and sharing in social media.

There is the common user interface, *Finna.fi,* and also different interfaces for different libraries, e.g., Lapland University Library Consortium has an interface called *luc.finna.fi.*

With Finna's administrative interface, each library can select and switch on data sources from the index and make them searchable in their library user interface.

As a platform service Finna is clearly becoming significant for Finnish research libraries. Finna offers tools to build and maintain a discovery layer to meet the organisational needs. Libraries participating in Finna replace their old OPACs with a new Finna discovery interface which also includes their licensed resources.



Poster by Maria Virtanen, Erkki Tolonen, and Aleksi Turpeinen, 2016.

2. Finna from an Arctic Research Joint Library´s Point of View

LUC Library is a joint library for two institutions of higher education, University of Lapland and Lapland University of Applied Sciences. They are two independent organisations and their cooperation is based on agreements. But LUC Library must have three different user interfaces to Finna. One for University of Lapland users so that they are able to use the electronic resources the University has licensed for them. The other one for Lapland UAS users so that they can use the electronic resources the Lapland UAS has licensed for them. The third one is for external users, e.g., for people who are not affiliated with either University of Lapland or Lapland UAS. In Finland, university libraries are open for all.

In the beginning there were doubts about how this kind of general user interface that combines the information contents of all memory organisations could ever work for research libraries and researchers. Is this going to be something that doesn´t answer any demands because it tries to cover so many different demands?

It has been shown that students are quite pleased with Finna. It gives a fresh and modern way for finding diverse information. For students, Finna gives an easy way to find basic literature.

For researchers, the situation is more complex. Finna doesn't cover all the databases they need because of technical and IPR-reasons. The needs of researchers are very specific and the single search interface is never as effective and specific as the native interfaces of various databases. Still it gives much more material than Google.

The amount and selection of Open Access materials is under consideration. They are not included in library databases nor in the subscribed material. With the materials from archives and museums as well as libraries, *Finna.fi* serves especially the needs of researchers in humanities, arts, and social sciences.

3. Arctic / Northern Information

The rich and continuously expanding information resources in Finna will help mapping change, at least in Finland. Finna contains some very interesting northern or Arctic information — not only books and articles but also images, physical objects, maps, and sounds.

Among libraries, one of the most interesting from the Arctic point of view is the National Library with its many special collections. Among museums, the most interesting from this point of view are the collections of National Museum and National Board of Antiquities, both situated in Helsinki. There are even two Lappish Museums, Gold Prospector Museum in Sodankylä and Forestry Museum of Lapland in Rovaniemi. Among the 14 archives included, National Archives in Helsinki and Provincial Archives of Oulu are the most important for Arctic materials.

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Mapping Change in a Small Library Environment: From Reading Room to Communications Center (abstract only)

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At the 2014 Colloquy, I shared plans to transform the Institute of Arctic and Alpine Research (INSTAAR) Library into a science communication center in a new space that we share with many other university, federal, and nonprofit units. This paper will revisit this transition, describing what actually happened; identify changes to collections and services; and map how the space is used, especially for actions to increase resilience and respond to climate change. It will examine how the identity of the library at the heart of the space informs the different activities that happen there now in some unexpected ways. And it will briefly show how the function of the library has shifted from the perspective of students, faculty, the (ex)librarian, and other stakeholders.

Depending on how you hear this story, you might see it as melancholy: another special library downsized. Or you might see it as heartening: a small collection has become a catalyst for action and occupies a central position in a new, shared facility. Either way, the INSTAAR Library will never be the same.

The Continued Evolution of the Cold Regions Bibliography Project: Current Status of the *Antarctic Bibliography* and the *Antarctic Journal of the United States* and its Predecessors

Sharon Tahirkheli, American Geosciences Institute, USA

The Cold Regions Bibliography Project (CRBP) at the American Geosciences Institute (AGI) combined two of the major bibliographies of the Polar Regions — the *Antarctic Bibliography* and the *Bibliography on Cold Regions Science and Technology.* These two bibliographies had been produced with funding from US National Science Foundation (NSF) and the US Army Corps of Engineers, and were compiled by the Library of Congress (LC) until 1998. In 2000, the American Geosciences Institute began the maintenance of the two bibliographies and continued to compile them through 2011. Once the funding for compilation of the bibliographies ceased, efforts to preserve the data for future use were undertaken.

History of the Cold Regions Bibliography Project

The *Antarctic Bibliography* was initiated in 1962 under the sponsorship of the NSF. Coverage of multidisciplinary publications about the Antarctic region began with items produced in 1961. The Bibliography included materials on all aspects of science as well as the logistics of research in the polar climate. All of the references included abstracts, geographic descriptors, and controlled vocabulary. The intent was to cover as much of the scientific literature pertaining to the Antarctic as possible. After the American Geosciences Institute took over the compilation, collaboration was sought with groups doing research in Antarctica. Significant data was provided to the Bibliography by the Scott Polar Research Institute, including several thousand references from the period when the project was dormant (1998–2000) (Tahirkheli, 2002) and another 8000 references to publications from the 1950s. By 2011 approximately 2200 new references were being added to the Bibliography each year. The current version of the online database contains more than 91,000 references.

The *Bibliography on Cold Regions Science and Technology* began in 1951 under sponsorship of the US Army Corps of Engineers (Liston, 2002). Eventually, the Bibliography came to be known as the CRREL Bibliography and support was provided through the Corps' Cold Regions Research and Engineering Laboratory in Hanover, NH. The Bibliography included

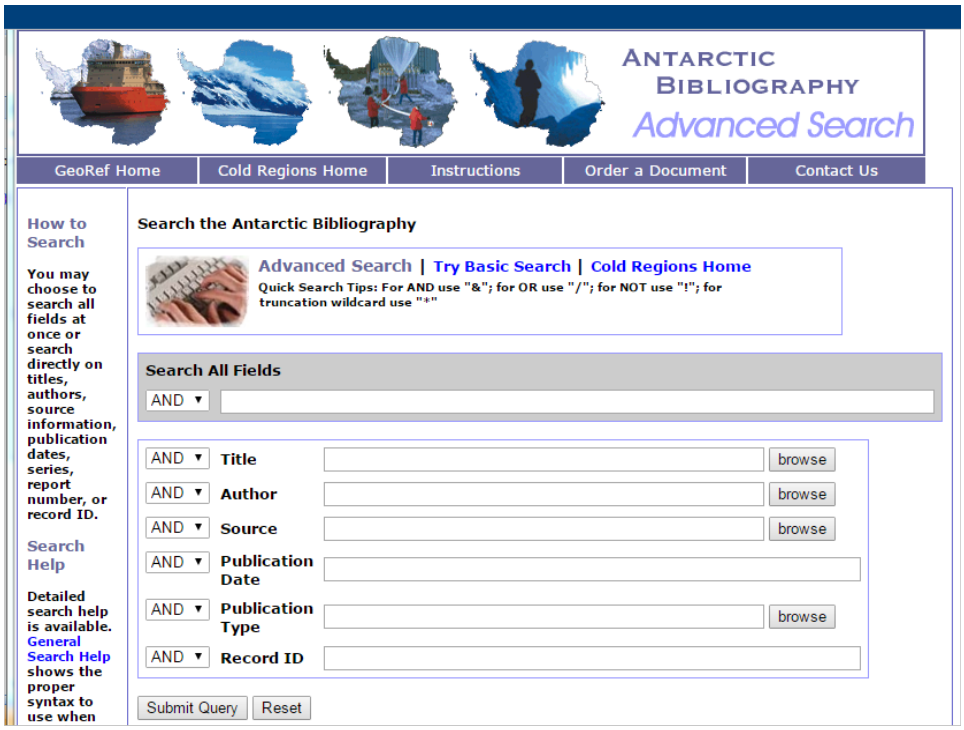
multidisciplinary publications spanning the time period from the early 1900s through 2011. The focus of coverage was primarily engineering in a cold environment. By the conclusion of the compilation in 2011, the American Geosciences Institute was adding about 6500 new references per year and the Bibliography contained more than 250,000 references.

The Cold Regions Bibliography Project also collaborated with the Arctic Institute of North America, the Scott Polar Research Institute, and the National Snow and Ice Data Center to cover publications produced as a result of the International Polar Year 2007–2008. The CRBP attempted to cover US funded research and to contribute the relevant references to a joint database. When funding ended in 2011, the contributions of the CRBP to the joint database were almost entirely eliminated.

In 2011, the CRBP, with funding from the US National Science Foundation, undertook a digitization project for the *Antarctic Journal of the United States* and its predecessors. The recent volumes of the *Antarctic Journal of the United States* were hosted on the NSF website, but earlier volumes existed only in print volumes.

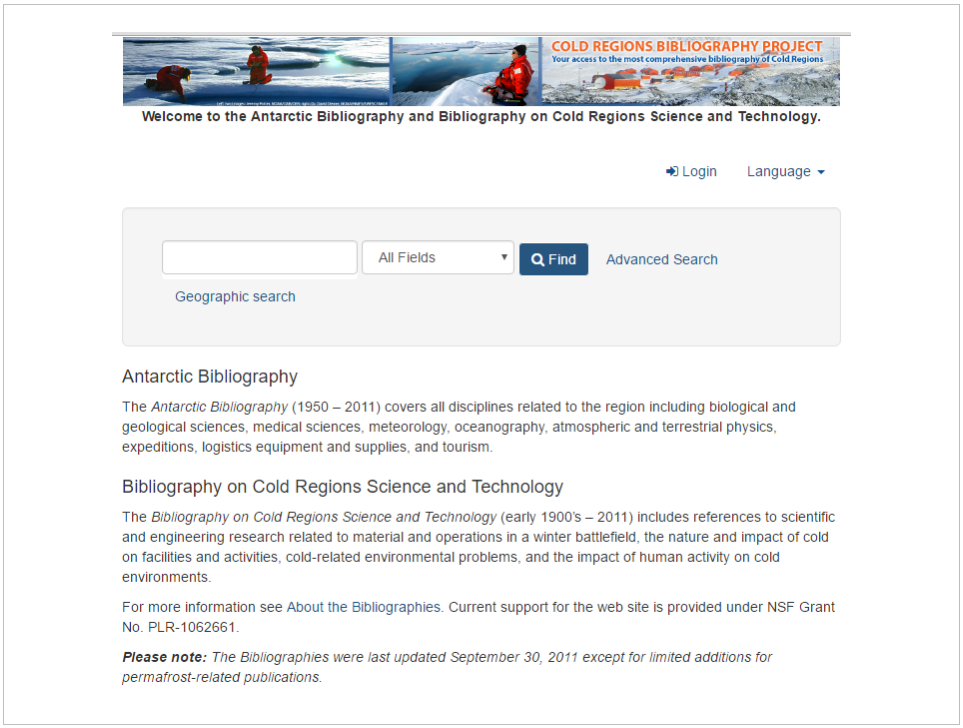
Migration of the Bibliographies to a New Platform

In 2015 AGI was funded to future-proof the data compiled in the Bibliographies with the hopes of preserving the information for continued future use. The original Bibliographies were searchable using a website developed in 2000. The site provided basic and advanced search options with options to email, download, and print references. References could only be grouped in sets of 20 items. Searches, while permitting restrictions to specific fields, did not allow for further refinement.



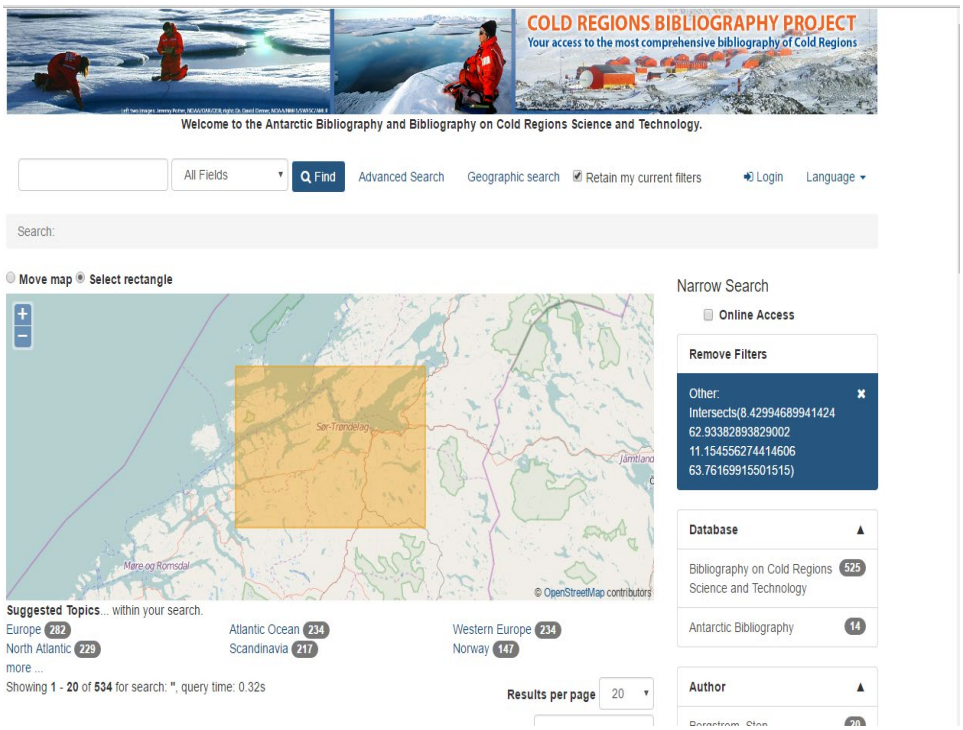
Advanced search screen for the Antarctic Bibliography, *2000 website.*

New open-source software offered increased functionality. VuFind (http://vufind-org.github.io/vufind/) was chosen for the search interface. This software allows search results to be refined by document types, online availability options, language of the publication, country of publication, and year published. Similar items are displayed and can be selected. Additional topics are suggested based on co-occurrence with the references that are retrieved and displayed. Built-in features include: the possibility of emailing results, downloading references into multiple citation managers, developing individual user accounts, and saving search histories and lists of references. In addition, help is available in a minimum of a dozen languages.



2016 website (www.coldregions.org).

To increase the usability of the databases, the decision was made to develop a geographic search interface. This interface, while not a standard feature of VuFind, had been partially developed by other users of the interface and, using this initial work as a starting point, a more robust interface was developed to enable users to search by outlining a space on a map.



Example of Geographic Search Option over a portion of Norway.

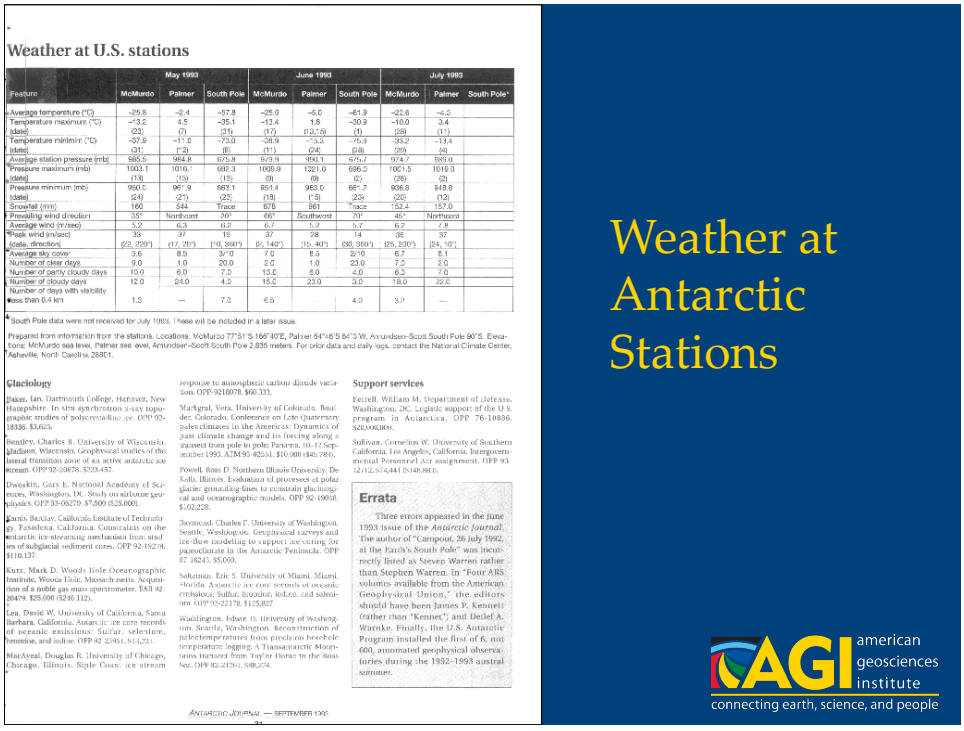
Several complex issues had to be overcome to load the databases into VuFind. First, the original data provided to AGI by the Library of Congress was not available in MARC format. VuFind works best with MARC data and the references produced by AGI since 2000 could all be easily cross-walked to MARC. A mapping program was developed to map the LC data to MARC. Some of the data had been created more than 30 years earlier and did not contain the granularity needed to create the optimum MARC record; however, the full source fields from the original records were loaded into VuFind and added to the record display to insure that all data would be preserved. In addition, none of the data from LC contained the latitude and longitude information needed for the geographic interface. Georeference data from the *GeoRef Thesaurus* (Goodman, 2008) was used to supplement the specific geographic descriptors. Antarctica does not contain many geographic reference points and the final map interface often displays vast open areas without any named features.

Permafrost Alerts and Updates

In 2012 the US Permafrost Association (http://www.uspermafrost.org/) decided to support the production of a monthly alert containing listings of recent permafrost publications for its members. The monthly alerts are distributed via email and hosted online on the Association's website. Between 50 to 100 new references are distributed each month. In addition, the references identified for the Permafrost Alert have been added to the online bibliographies.

Digitization of the *Antarctic Journal of the United States*

The *Antarctic Journal of the United States* was established in 1966 by NSF's Office of Polar Programs. It was preceded by the *Antarctic Report* (1964–1965); *Antarctic Status Report* (1962–1963); *Bulletin of the US Antarctic Project Officer* (1959–1965); and the *Antarctic Status Report USNC–IGY* (1956–1958). The journal reported on US activities in Antarctica. Quarterly reports of weather at the US stations were provided, as well as short reports on research projects. Operations activities were listed.



Example of quarterly weather reports from Antarctic stations.

The five journals consisted of 298 separate issues. Some of the materials were mimeographed sheets. Others were bound volumes with tight bindings. The journals were scanned, JPEGs and PDFs created, and OCR performed. As each issue was reviewed for quality, bookmarks

were created for the separate sections of the issue. Each separately-authored research report was treated as a separate PDF and permanent URLs were developed to allow linking from the *Antarctic Bibliography* references. Both full issues and individual reports were made available to users and the PDFs were optimized to limit download times. The total number of reports digitized were 4321 items.

The *Antarctic Journal of the United States* is being held in AGI's repository and is made available on the same website as the searchable bibliographies. In addition, AGI would like to find additional repository sites for the *Journal* to insure its future retention and availability to users.

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Connect the North: The Arctic Connect Project

Shannon Christoffersen Vossepoel, Arctic Institute of North America, University of Calgary, Canada & Maribeth S. Murray, Steve Liang, James Parker Badger, Bindu Panikkar, and Byron Chu

ArcticConnect Overview
http://arcticconnect.org

ArcticConnect is a network-enabled platform for Arctic data sharing, analysis, and synthesis. The University of Calgary's Arctic Institute of North America, the Department of Geomatics Engineering at the Schulich School of Engineering, and Cybera, Inc. have partnered together to create this unique system. ArcticConnect captures data at multiple scales, in diverse formats from a host of sources, including human observers, down-scale and remote sensors (including satellites), as well as publications, photographs, and even artwork. It enables networking and interoperability of disparate datasets and makes information available across varied applications and devices.

ArcticConnect enables display of heterogeneous data and information within a coherent geospatial platform consisting of four major components: Arctic Web Map, Arctic Scholar, Arctic Sensor Web, and Arctic BioMap.

Arctic Web Map
http://webmap.arcticconnect.org

Arctic Web Map (AWM) is an Arctic-specific web mapping tool allowing researchers to customize map projections for scientifically accurate visualization and analysis, a function that is critical for Arctic research but missing in existing web mapping platforms. It provides a visually appealing tool for education and outreach to a wider audience.

Arctic Web Map has two components, an Arctic-focused tile server and a Leaflet-based client library. By providing tiles in multiple Arctic projections, data can be more accurately visualized compared to most Mercator-projected map tiles.

The client library, PolarMap.js, is designed to be easy to use and easy to extend. It does this by providing a simple wrapper for building a typical Leaflet map, and also by providing base classes that can be customized to build a web map for your specific situation. The PolarMap.js API is open source and can be downloaded from GitHub (https://github.com/GeoSensorWebLab/polarmap.js).

Currently the Arctic Web Map supports six Arctic projections on the tile server: EPSG:3571, EPSG:3572, EPSG:3573, EPSG:3574, EPSG:3575, and EPSG:3576. These projections provide a Lambert Azimuthal Equal-Area (LAEA) view of the North Pole region, from 45°N to 90°N. Each projection is centred on a specific longitude: 180°W, 150°W, 100°W, 40°W, 10°E, and 90° E.

Using this projection means areas near the centre of the map (the North Pole) will not be distorted as they are when viewed in a Mercator projection such as Google Maps, Bing Maps, or OpenStreetMap. The LAEA projection used specifically preserves the area of land masses such that relative size can be determined, but it does distort the shape of land masses towards the edges of the map. This is why the map is cut off at 45° N.

Tiles include data from multiple data sources. Most of the layers, including locations, land uses, roads, buildings, etc., are from OpenStreetMap under the Open Data Commons Open Database License (ODbL). Land polygons are also from OpenStreetMap. Administrative boundaries, geographic lines, and bathymetry data layers are courtesy of Natural Earth.

If you are interested in using Arctic Web Map tiles in one of your own projects, the ArcticConnect team is happy to work with you. You can find more information at http://webmap.arcticconnect.org.

Arctic Scholar

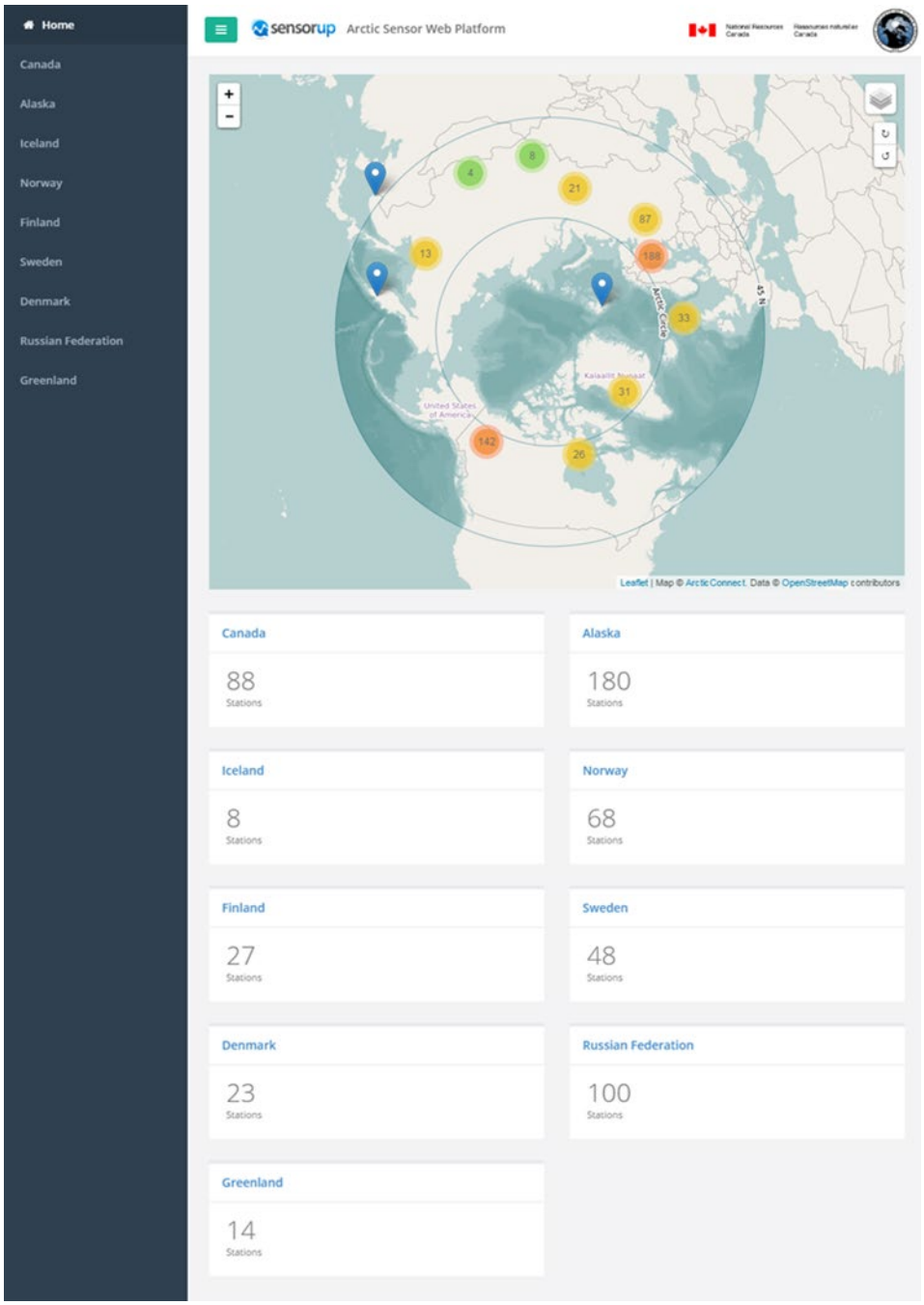
http://records.arcticconnect.org

Arctic Scholar (AS) enables researchers, educators, interested private sector entities, government agencies, and the general public to access and share Arctic data and information contained in assorted formats including publications, grey literature, research licenses, photo archives, field notes, and project metadata from Arctic field stations.

The current demonstration site shows a map linked with the Arctic Institute of North America's Arctic Science and Technology Information System (ASTIS). The map is set up to display any ASTIS publications or research projects that contain geographical coordinates. The map displays the ASTIS record number, the record's title, the abstract information, and a link to the original record in ASTIS. The markers are colour-coded for ease of use: yellow markers represent publications, red markers represent research project descriptions, and green represents a cluster of multiple records.

ASTIS currently holds publications that include books, journal articles, government and industry documents, and descriptions of research projects. Plans are in place to redesign ASTIS and expand it to include photographs, art, and other materials, notably from the Arctic Institute's own vast collections. A grant application is currently pending which will cover the cost of the search interface redesign as well as the development of educational tools, digital exhibit space, translation into Inuktitut, and beginning the digitization of archival materials.

Arctic Sensor Web
http://sensorthings.arcticconnect.org

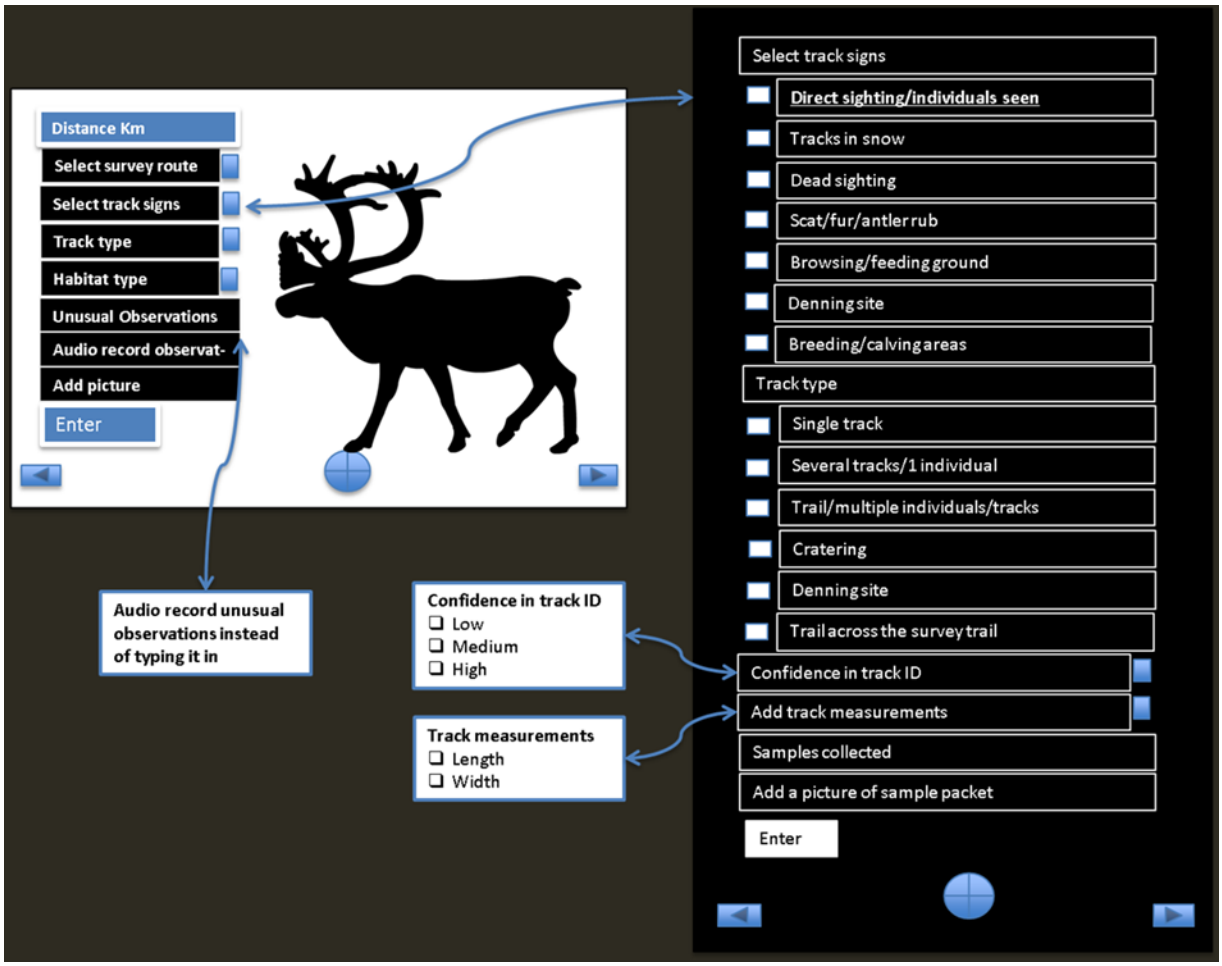


Arctic Sensor Web (ASW) enables research stations around the pan-Arctic to connect their sensors, including those that provide near real-time data, to a cloud service for visualization, information sharing, and collaborative analysis.

Sensor metadata is currently online for more than 500 research stations across the pan-Arctic. Data coming in from sensors includes: temperature, barometric pressure, relative humidity, precipitation levels, dew point, wind direction, and wind speed.

The sensor web is capable of handling all kinds of sensor information — including live feeds — and more information is continuously being added as more research stations and collaborators come online.

Arctic BioMap



Arctic BioMap (ABM) will enable members of the scientific community and northern residents to contribute observations on arctic wildlife for the purpose of biodiversity and wildlife health

monitoring, assessment, research, management, and education. The app is in development and is currently in the testing phase with communities.

Arctic BioMap will be available online or via smartphone application for community members to track wildlife health in the field. Community members will be able to record pictures, videos, and notes. All observations will be geocoded, and linked to the nearest weather station with time and date of entry. The app can be used where there is no network connection available; the data entered will be stored in a local cache. Data will be automatically uploaded to the Arctic BioMap data service when there is a network available. Arctic BioMap will use PhoneGAP, an open source framework that is able to create mobile apps for multiple platforms (such as iOS and Android).

Arctic BioMap is currently being developed with input from Dr. Susan Kutz and her team, from the University of Calgary's veterinary medicine program. Data from the application will be sent to her team for analysis, then uploaded and stored in the Canadian Wildlife Health Cooperative database, with output in a visually appealing and easy-to-read graphical format for the communities.

Conclusion

ArcticConnect is designed to link efforts among Indigenous people, the research community, the private sector, and government agencies engaged in the collection and use of northern environmental data, to improve management of and adaptation to a changing Arctic. This collaborative and open approach to data management and accessibility will advance the science and education that is needed for decision-making in a rapidly changing Arctic.

ArcticConnect is open access, open source, and our goal is to be interoperable and connected with other data and information platforms. We look forward to continuing our relationships with our fellow polar information professionals and using this new technology to enhance our ability to connect polar data systems and polar libraries.

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POSTERS

Languages and Dialects in the Digital Library North (abstract only)

Sandy Campbell, J.W. Scott Health Sciences Library, University of Alberta, Canada

The Digital Library North is being developed jointly by the Inuvialuit Cultural Resource Centre and the University of Alberta. The goal is to create a digital library that will meet the needs of the Inuvialuit people. The Inuvialuit people recognize three dialects of the Inuvialuktun language: Siglitun, Uummarmiutun, and Kangiryuarmiut, all of which are currently in use. One of the goals of the Digital Library North is to supply access to materials through metadata created in all three dialects. While Siglitun and Uummarmiutun are understood as dialects of Inuvialuktun, Kangiryuarmiut, also known as Inuinnaqtun, is considered in some areas to be both a dialect of Inuvialuktun and Inuktituit. Inuinnaqtun has been recognized with its own international language code "Ikt," however no codes exist for Siglitun, Uummarmiutun, and Inuvialuktun. This poster will demonstrate the current use of the three dialects in the Inuvialuit Settlement Region, efforts to establish language codes for all of the dialects, and the next steps in building a digital library interface that will be searchable in all of the dialects.

Bridging Arctic Indigenous Knowledge with the Digital World: Sharing Indigenous Ways of Knowing in Partnership with Arctic Communities (abstract only)

Heidi McCann, National Snow & Ice Data Center, University of Colorado Boulder, USA

Indigenous Arctic residents have a unique understanding of the environment in which they live. For millennia, Indigenous knowledge was handed down orally from elder to youth through experiences on the land, such as traveling across sea ice, learning seasonal hunting and harvesting patterns, preparing and storing food for the community, making durable clothing, and watching the sky to read the weather.

Over the last few decades, a collaboration between Indigenous Arctic populations and Arctic research scientists has developed to address shared challenges and to provide significant contributions to the understanding of a rapidly changing Arctic climate. As the digital world reached the far North, Indigenous Arctic peoples began reclaiming control of how their knowledge was presented and shared using online applications. With the advent of newer technological tools, such as interactive databases and online mapping, smartphones, and social media, community elders are embracing the benefits of the digital age, seeing that these tools can engage and connect the youth to their rich, cultural pasts in a manner that will reflect the values of their respective cultures. Used effectively, such tools provide an additional method for Indigenous people to present themselves and their views of the world around them to local and global audiences and to future generations. As cultural shifts embrace technology and as worldwide interest in the value of local and Indigenous knowledge increases, programs to care for such collected information must meet the demand of curating this knowledge over the long term.

Now in its ninth year, the Exchange for Local Observations and Knowledge of the Arctic (ELOKA) addresses the critical need to manage local and Indigenous knowledge so that (1) the information is not lost, but rather protected and preserved; (2) the information is discoverable; and (3) the information has influence on environmental research, policy, and public awareness. ELOKA provides data management services and user support to facilitate the collection, preservation, exchange, and use of local observations and knowledge of the Arctic. For example, ELOKA has collaborated with Alaskan, Canadian, and Siberian communities to create interactive online atlases mapping local place names and displaying important local knowledge. These atlases are actively used, maintained, and expanded by individuals in those communities. Websites provide context for the local and Indigenous knowledge and contain interviews from several Arctic Inuit hunters.

Other products include software applications to display near real-time weather conditions from stations on Baffin Island, Nunavut, Canada, and an interactive database of ongoing local observations of sea ice and weather on the Alaska coast. In this poster we will present products developed collaboratively with Arctic Indigenous communities that demonstrate the careful curation and presentation of Indigenous knowledge in digital resources.

The Canadian Consortium for Arctic Data Interoperability (abstract and poster)

Shannon Christoffersen Vossepoel, Arctic Institute of North America, University of Calgary, Canada

The Canadian Consortium for Arctic Data Interoperability (CCADI) is composed of a group of Canada's foremost Arctic scholars and Arctic data managers at the University of Calgary (Arctic Institute of North America), the University of Waterloo (Canadian Cryospheric Information Network and Polar Data Catalogue), Carleton University (Geomatics and Cartographic Research Centre), the University of Manitoba (Centre for Earth Observation Science), Université Laval (Centre d'études nordiques), Inuit Tapiriit Kanatami, and Polar Knowledge Canada. CCADI members are also leading contributors to the Arctic Data Committee (ADC) of the International Arctic Science Committee and Sustaining Arctic Observing Network, the International Study of Arctic Change (ISAC), the Canadian Network of Northern Research Operators (CNNRO), ArcticNet, and the Polar Libraries Colloquy. It is well-positioned to take leadership in advancing collaboration, nationally and internationally, through development of an integrated national data management system that facilitates information discovery, establishes metadata and data sharing standards, and enables interoperability.

CCADI

The Canadian Consortium for Arctic Data Interoperability

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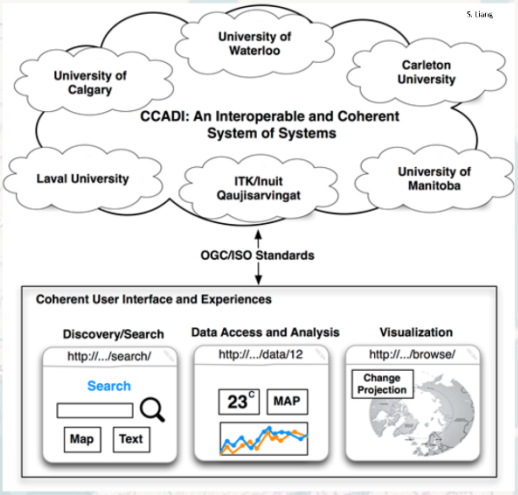
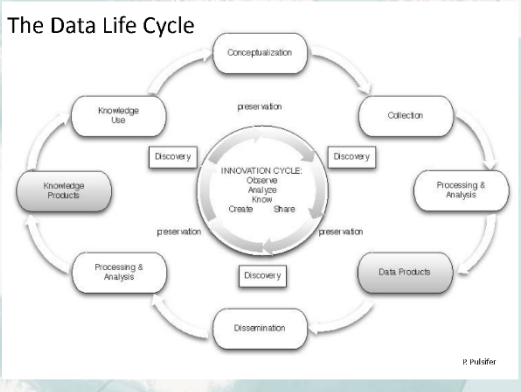
CCADI members are also leading contributors to:

- the Arctic Data Committee (ADC) of the International Arctic Science Committee and Sustaining Arctic Observing Network
- the International Study of Arctic Change (ISAC)
- the Canadian Network of Northern Research Operators (CNNRO) ArcticNet
- and the Polar Libraries Colloquy.

It is well-positioned to take leadership in advancing collaboration, nationally and internationally, through development of an integrated national data management system that facilitates information discovery, establishes metadata and data sharing standards, enables interoperability among existing data infrastructures, and is accessible to the broadest possible audience of users.





Improved Cyberinfrastructure Will:

1. Facilitate transformative research on priority science questions about the Arctic system;
2. Empower Inuit communities to address their data priorities;
3. Demonstrate Canada's ability to lead in providing accessible, interoperable, and useable data to the international community; and
4. Enable translation of complex scientific information and Inuit TK into policy-relevant material.

Key Elements:

- Standards and mechanisms for metadata interoperability, semantic interoperability and implementation of these.
- Distributed data exchange platform for contributors, users and repositories.
- Streamlined data services with common entry, access, search, match, analysis, visualization & output tools.
- Intellectual property and sensitive data service.
- Data stewardship capacity.

Table 1. Summary of Common Cyberinfrastructure Needs and CCADI Proposed Solutions.

Common Needs	CCADI Proposed ACI Solutions
Standards & mechanisms to enable interoperable cyberinfrastructure among institutes & online archives.	Best practices based on established international interoperability protocols for MD/data using ISO & OGC standards (i.e., ISO 19115 & ISO 15836 for metadata, OGC & ISO 19156 for observations, OGC WMS/WFS/WCS for sharing mapping data over the web etc.) linking our cyber-infrastructure & other organizations as the project matures.
Multiple nodes to accommodate geographically & thematically dispersed MD/data contributors, users & repositories.	A distributed interoperable cyber platform that integrates existing, independent data portals into a coherent system of systems, including computing, storage, DBs, file systems, & web applications. Access to uniform MD/data resources while portals provide information in preferred & previously unavailable ways.
Simple, streamlined data entry with common access, search, match, analysis, output & visualization tools.	Intuitive, interoperable data entry mechanisms for project & dataset MD/data, including new & intelligent data authoring tools, mobile applications, mobile-enabled repository websites & web-based tools for visualization and analysis of heterogeneous data. Five-star Linked Data[3] based on standard ontologies for searching & reasoning external systems.
Protection of intellectual property rights, sensitive data.	Standard system mechanisms to transmit and respect intellectual property & data sharing agreements between researchers, communities & institutions.
Data stewardship capacity for the long term.	Educational & training materials for data collectors & users to enable data sharing, & open access as per international standards & protocols.

[3] Heath, Tom, and Christian Bizer. "Linked data: Evolving the web into a global data space." *Synthesis lectures on the semantic web: theory and technology* 1.1 (2011): 1-136.

Murray, Maribeth (1), S. Vossepoel (1), D. Barber (2), C. Barnard (3), B. Chu (4) J. Friddell (5), A. Hayes (6), E. LeDrew (5), S. Liang (7), G. Ljubicic (6), S. Luque (2), S. Nickels (8), T. Papakyriakou (2), P. Pulsifer (9), C. Re's (2), J. Sokol (10), F. Tay or (6) and W. Vincent (3)
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