

Cumulative Impact Monitoring Program Database Climate Change Inventory Methodology Report

Background

A literature review was completed from December 2022-March 2023 to identify climate change-related research relevant to the NWT since 2017 stored in the [NWT Discovery Portal](#) (the Portal). Applicable research included Cumulative Impact Monitoring Program (CIMP)-funded projects that identified a specific climate change impact to the natural or human environment, published between 2017-2023.

Methodology

Inclusion and exclusion criteria were applied throughout the literature review to determine which resources qualified to be included in the Inventory. Table 1 outlines the inclusion and exclusion criteria referenced throughout the searches. The criteria were provided to the contractor by the Climate Change and Air Quality (CCAQ) team at the beginning of the project.

Table 1. Literature review inclusion and exclusion criteria

Included	Excluded
<ul style="list-style-type: none"> • Research funded by CIMP and identified in the Portal 	<ul style="list-style-type: none"> • Research not funded by CIMP and not identified in the Portal*
<ul style="list-style-type: none"> • Publications from January 1, 2017-March 31, 2023 	<ul style="list-style-type: none"> • Publications prior to January 1, 2017
<ul style="list-style-type: none"> • Research related to climate change impacts to the natural or human environment in the NWT • Any research dealing with an adaptation measure in response to a climate change impact was included • Research dealing with governance or policy was included only if that research also included climate change impacts as a primary component 	<ul style="list-style-type: none"> • Any research that did not include a climate change impact as a primary component of the research (e.g., research dealing exclusively with adaptation policy or greenhouse gas reduction measures) • Any research dealing primarily with governance • Any research located outside the NWT
<ul style="list-style-type: none"> • Published journal articles, theses and final reports. If there was no final report available, then annual reports were included 	<ul style="list-style-type: none"> • Presentations, annual reports (if a final report was available), fact sheets, outreach materials

**An exception was applied to published scientific papers resulting from research identified in the Portal and located through online publication databases during the second phase of the literature review*

Search Strategies

Resources were first identified through searches in the Portal, followed by searches using online science databases. Searches were conducted in the Portal using a variety of advanced search

filters and keywords to capture all projects relating to climate change impacts published since 2017. Specific filters applied included:

- Filtering by: Cumulative Impact Monitoring Program (CIMP)
- Advanced search< Search Filters:
 - Subject area: Climate and Climate Change
 - Start date: 2017-01-01
 - End date: Present date
 - Filter results by location: Northwest Territories
 - Data Type: Articles, Papers & Reports

Portal search results were then screened to identify resources that met the literature review inclusion criteria. Additional searches were applied using the above filters and a variety of keywords in the simple search function, including “title:climate change”, “climate change”, and (“climate change” AND “impact*”). The same search filters were then applied for all other subject areas (Air Quality, Biodiversity, Birds, Fish Habitat/Population/Harvest, Fish Quality, Human Health and Community Wellness, Land Mammals, Marine Life, Snow/Ground Ice/Permafrost, Vegetation, Water Quality, Water and Sediment Quality).

Portal searches were subsequently conducted using the “NWT CIMP Library Public” spreadsheet, provided by CCAQ mid-project. This spreadsheet was created by a student at the GNWT a few years prior, summarizing CIMP resources in the Portal. This proved to be a helpful resource to identify relevant CIMP projects. First, all CIMP project titles and summaries were reviewed in the spreadsheet. If projects were deemed relevant after applying the inclusion criteria, the CIMP project number was entered in the Portal to locate copies of resources to download and review further. Peer reviewed journal articles were then identified from the authors of these resources by searching the Wilfrid Laurier University Omni online database. This method was much more effective at locating relevant resources than searching directly in the Portal given challenges encountered with the Portal, in particular, it’s inability to apply search filters correctly.

All entries in the “NWT CIMP 1999-2023 Project Factsheet” document were then reviewed. This factsheet was also provided by CCAQ mid-project. A preliminary scan of project titles and publication dates was performed. CIMP project numbers were entered in the Portal to locate relevant documents that met the inclusion criteria. Similar to the methods used when reviewing resources identified through the “NWT CIMP Library Public” spreadsheet, searches for peer reviewed publications were conducted once relevant documents were identified in the Portal by entering author names and project titles in the Laurier online database.

Searches were then performed to identify additional scientific publications that exist coming from the research identified in the Portal using Google Scholar, ResearchGate, and Web of Science.

Spreadsheet

All identified relevant literature was summarized in a Microsoft Excel spreadsheet with the relevant fields including: article title, author(s), publication date, author type (academic, government, NGO, etc.), publication type (journal article, report, thesis, etc.), abstract, relevance to the NWT, region (North Slave, South Slave, Sahtu, Dehcho, Beaufort Delta), area (community, park, geographic feature, etc.), keywords, Indigenous Knowledge (Yes/No), APA citation, link to the resource online, and CIMP project #. Literature was organized by topic

(climatology, fresh water/ice, marine water/ice, animals, vegetation, humans, ecosystems, landscape processes, archaeology/paleontology, and infrastructure/energy).

Challenges and Recommendations

Challenges were encountered with the Portal given its inability to correctly apply search filters. In particular, the Portal did not apply subject area, data type and publication date search filters correctly. For example, despite searching for CIMP articles, papers and reports addressing climate change impacts in the NWT published between 2017-2023, search results included hundreds of posters, presentations, fact sheets and datasets published prior to 2017 on unrelated topics. Therefore, significant time was required to manually screen the Portal search results to identify relevant documents. Few resources were identified using this method, and it proved to be time intensive. CCAQ and Geomatics were notified of these issues, but technical solutions within the Portal could not be provided.

The contractor circumvented these issues by reviewing the comprehensive lists of CIMP projects (the “NWT CIMP Library Public” spreadsheet and the “NWT CIMP 1999-2023 Project Factsheet”) to identify relevant CIMP project numbers to enter in the Portal. Therefore, rather than using the Portal search filters, it was most effective to identify relevant CIMP projects using comprehensive project listings provided by CCAQ and then use the Portal to locate documents by entering the specific CIMP project number.

The following are a summary of recommendations for future Inventory development:

- Update the “NWT CIMP Library Public” spreadsheet to have a comprehensive and current list of all CIMP projects
- Use comprehensive project listings (such as the “NWT CIMP Library Public” spreadsheet, the “NWT CIMP 1999-2023 Project Factsheet” and CIMP Annual Reports) as a starting point to identify relevant projects and project numbers to then enter in the Portal to identify resources
- Troubleshoot search filter issues with the Portal (Geomatics)

General comments

Research relating to marine water and ice, humans, archaeology, and paleontology were not identified through the literature review. This is likely because NWT CIMP is focused on cumulative impacts related to caribou, water and fish. Interestingly, the lack of climate change-related research relating to marine water and ice highlights the need for CIMP to fund more research on this topic to fill this gap in knowledge.

Further, it was noted that fewer CIMP-funded climate change-related projects have been conducted over the past five years in comparison to years prior to 2017. This could be due to the COVID-19 pandemic and subsequent project extensions which have delayed research reporting and publications.