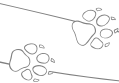


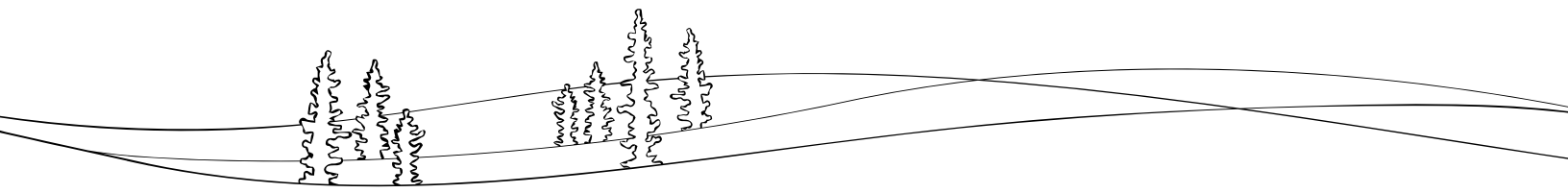


NWT Climate  
Change Action Plan:  
ANNUAL REPORT 2019/20

RAPPORT ANNUEL 2019/20  
sur le plan d'action  
sur le changement  
climatique des TNO

Le présent document contient la traduction française du résumé et du message du ministre.





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# Abbreviations and Acronyms

## **Annual Report**

NWT Climate Change Action Plan  
Annual Report 2019/20

## **Action Plan**

2030 NWT Climate Change  
Strategic Framework 2019-2023  
Action Plan

## **ARI**

Aurora Research Institute

## **CCCS**

Canadian Centre for Climate  
Services

## **CCMEO**

Canada Centre for Mapping and  
Earth Observation

## **CCSF**

2030 NWT Climate  
Change Strategic Framework

## **CFS**

Canadian Forest Service

## **CIRNAC**

Crown-Indigenous Relations  
and Northern Affairs Canada

## **ECCC**

Environment and Climate  
Change Canada

## **ECE**

Department of Education,  
Culture and Employment

## **EIA**

Department of Executive  
and Indigenous Affairs

## **Energy Strategy**

2030 Energy Strategy

## **ENR**

Department of Environment  
and Natural Resources

## **FIN**

Department of Finance

## **GNWT**

Government of the  
Northwest Territories

## **GSC**

Geological Survey of Canada

## **HSS**

Department of Health  
and Social Services

## **IGO**

Indigenous governments  
and organizations

## **INF**

Department of Infrastructure

## **ISSS**

Information Systems Shared  
Services (Department of Finance)

## **ITI**

Department of Industry, Tourism  
and Investment

## **MACA**

Department of Municipal and  
Community Affairs

## **MSC**

Meteorological Survey of Canada

## **NWT**

Northwest Territories

## **NGO**

Non-governmental organizations

## **NTGS**

Northwest Territories  
Geological Survey

## **OAG**

Office of the Auditor General  
of Canada

## **PCF**

Pan-Canadian Framework on Clean  
Growth and Climate Change

## **LGANT**

Local Government  
Administrators of the NWT

## **PCA**

Parks Canada Agency

## **PSC**

Public Safety Canada

## **NWTAC**

Northwest Territories  
Association of Communities

## **SCC**

Standards Council of Canada

## **NRCan**

Natural Resources Canada

# Minister's Message



**The Honourable  
Shane Thompson**  
*Minister of Environment  
and Natural Resources*

Climate change is one of the greatest challenges of our time, and its impacts are being felt more acutely in the North than anywhere else in Canada.

The people of the Northwest Territories (NWT) know this intimately. They see it in changing ice conditions, later freeze-up in the fall, coastal erosion and changes in wildlife distribution.

A long-term and coordinated response in collaboration with our partners is needed to address climate change in our territory. That is why the Government of the Northwest Territories (GNWT) released the 2030 NWT Climate Change Strategic Framework (CCSF) in May 2018 and the 2030 NWT Climate Change Strategic Framework 2019-2023 Action Plan (Action Plan) in April 2019.

The release of the NWT Climate Change Action Plan: Annual Report 2019/20 provides Northerners with an update on the activities and progress we've made as a government and as a territory to address climate change and support strong, resilient communities.

I am pleased to say much progress has been accomplished. Of the 104 action items identified in Part 1 of our Action Plan, 96 are on track and three are complete. Furthermore, 25 of 57 tasks have been initiated from Part 2 of the Action Plan. Some specific highlights of this work include implementing the NWT Carbon Tax, establishing the Thaidene Nëné Territorial Protected Area and funding 28 projects under the Cumulative Impact Monitoring Program.

The CCSF, implemented in tandem with the the 2030 Energy Strategy and the NWT Carbon Tax, form the pillars of our government's response to climate change. These pillars provide a clear path forward, with actions to reduce greenhouse gas emissions as well as opportunities for adaptation. The GNWT is prepared to meet the significant challenges of climate change and deliver meaningful action and leadership. However, we are not acting alone.

Collaboration with communities and Indigenous governments and organizations, as well as other partners in industry and non-governmental organizations, is critical to meeting the goals in the Action Plan.

Examples of that collaboration can be found throughout this report, and I look forward to working with our partners as we move toward establishing a lower carbon economy, increasing our knowledge of climate impacts, and building resiliency to support a sustainable future for the NWT.

**The Honourable Shane Thompson**  
Minister of Environment and Natural Resources

# Message du ministre



**Shane Thompson**  
*Ministre de l'Environnement et  
des Ressources naturelles*

**Le changement climatique est l'un des plus grands défis de notre époque, et ses effets se font sentir plus fortement dans le Nord que partout ailleurs au Canada.**

Les Téoïis le savent mieux que quiconque : ils le remarquent dans les changements de l'état des glaces, le gel tardif à l'automne, l'érosion des côtes et les changements dans la distribution des espèces sauvages. Une réponse coordonnée et à long terme, en collaboration avec nos partenaires, est nécessaire pour résoudre le problème du changement climatique sur notre territoire. C'est pourquoi le gouvernement des Territoires du Nord-Ouest (GTNO) a publié le Cadre stratégique sur le changement climatique des TNO pour 2030 (CSCC) en mai 2018, et le

Plan d'action 2019-2023 relatif au Cadre stratégique sur le changement climatique des TNO pour 2030 (le plan d'action) en avril 2019.

La publication du Rapport annuel 2019/20 sur le plan d'action sur le changement climatique des TNO fournit aux Téoïis une mise à jour des activités et des progrès que nous avons réalisés, en tant que gouvernement et en tant que territoire, pour atteindre nos objectifs en lien avec le changement climatique et soutenir des collectivités fortes et durables.

Je suis heureux d'annoncer que beaucoup de progrès ont été accomplis. Sur les 104 mesures cernées dans la première partie de notre plan d'action, 96 sont en voie d'achèvement, et 3 sont achevées. En outre, 25 des 57 tâches ont été lancées dans le cadre de la deuxième partie du plan d'action. Parmi les faits saillants de ces chantiers, citons la mise en œuvre de la taxe sur le carbone aux TNO, la création de l'aire protégée territoriale de Thaidene Nëné, et le financement de 28 projets dans le cadre du programme de surveillance des effets cumulatifs.

Mis en œuvre en même temps, le CSCC, la stratégie énergétique 2030 et la taxe sur le carbone des TNO forment la clé de voûte de la réponse de notre gouvernement au changement climatique. Ces initiatives tracent une voie claire vers l'avenir, et comprennent des mesures visant à réduire les émissions de gaz à effet de serre et des mesures d'adaptation. Le GTNO est prêt à faire preuve de leadership, à relever les défis

importants que pose le changement climatique et à prendre des mesures concrètes. Heureusement, nous ne sommes pas seuls.

La collaboration avec les communautés, gouvernements et organisations autochtones, ainsi qu'avec des partenaires provenant de divers secteurs d'activité et d'organismes non gouvernementaux, est essentielle pour atteindre les objectifs du plan d'action.

Le présent rapport regorge d'exemples de telles collaborations, et je me réjouis de travailler avec nos partenaires pour mettre en place une économie à faibles émissions de carbone, ainsi qu'améliorer notre connaissance des répercussions du changement climatique, afin d'accroître la stabilité et d'offrir aux TNO un avenir durable.

**Monsieur Shane Thompson**  
Ministre de l'Environnement et des Ressources naturelles

# Executive Summary

The Government of the Northwest Territories (GNWT) is committed to providing strong leadership to address climate change mitigation and adaptation in the Northwest Territories (NWT).

The Mandate of the Government of the Northwest Territories (2019-2023) prioritizes the GNWT's commitment to climate change issues including strengthening the government's leadership and authority on climate change, ensuring climate change impacts are specifically considered when making government decisions, and reducing the cost of power and increasing the use of alternative and renewable energy.

While the GNWT recognizes its leadership role, collaboration with partners is integral to the NWT's success in mitigating and adapting to the effects of climate change, including reducing the cost of power and increasing the use of alternative and renewable energy.

The **2030 NWT Climate Change Strategic Framework** (CCSF) sets out the GNWT's long-term plan for addressing climate change. The **2030 NWT Climate Change Strategic Framework 2019-2023 Action Plan** (Action Plan) guides the implementation of the CCSF and presents a summary of priority actions and areas for future collaboration with both GNWT and external partners. The CCSF is being implemented in tandem with the **2030 Energy**

**Strategy** (Energy Strategy) which sets a path to more affordable, secure and sustainable energy in the NWT, and the **NWT Carbon Tax**, which outlines the NWT's approach to carbon pricing.

The NWT Climate Change Action Plan Annual Report 2019/20 (Annual Report) documents progress on the first year of implementation and reporting on the Action Plan. The purpose of the Annual Report is to ensure government transparency and accountability by sharing information about implementation with the public.

**The Action Plan is focused on three goals:**

- **Goal 1:** Transition to a strong, healthy economy that uses less fossil fuel, thereby reducing

greenhouse gas emissions by 30% below 2005 levels by 2030

- **Goal 2:** Improve knowledge of the climate change impacts occurring in the NWT
- **Goal 3:** Build resilience and adapt to a changing climate

The two cross cutting themes are leadership, communication and capacity-building, and economic impacts and opportunities. The two cross-cutting themes include actions which can apply to all three goals.

## REPORTING RESULTS FOR YEAR 1 – PART 1

The Action Plan is divided into two parts. Part 1 is work that was already underway or will be initiated and resourced in the 2019-2023 timeframe. There are a total of 104 action items under Part 1; 96 of these actions are on track, three are complete and five are not initiated. Although five action items are not initiated, all action items are anticipated to be complete by March 31, 2023. Status updates for each Part 1 action are presented in Appendix A.



## Goal 1: Transition to a Lower Carbon Economy

Implementation of the Energy Strategy and the NWT Carbon Tax are the primary action items in Goal 1 to support the NWT in its transition to a lower carbon economy.

### Highlights for 2019/20 include:

- Greenhouse gas (GHG) emissions reduction projects funded through support from the Capital Asset Retrofit Fund, Arctic Energy Alliance programs, and GHG Grant Program projects resulting in a 6 kilotonne (kt) CO<sub>2</sub>e (carbon dioxide equivalent) reduction.
- The NWT Carbon Tax came into force on September 1, 2019, meeting the GNWT commitment on carbon pricing under the Pan-Canadian Framework on Clean Growth and Climate Change. This was also a commitment made by the Department of Finance under Goal 1 of the Action Plan. The NWT Carbon Tax will increase annually from \$20 per tonne in 2019 to \$50 per tonne in 2023.

## Goal 2: Improve Knowledge of Climate Change Impacts Occurring in the NWT

For Year 1, actions under Goal 2 focus on using existing data, filling in baseline data and information gaps, and processing data to develop tools that can inform decision making. Fifty-one out of 54 action items related to Goal 2 were initiated in 2019/20. Research and monitoring focused

on permafrost, water and wetlands, forests and vegetation, wildlife, fish and marine mammals, human health and well-being, public safety, culture and heritage, and public and community infrastructure.

### Highlights for 2019/20 include:

- GNWT departments and external partners continued monitoring programs to assess water/snow quantity, forest conditions, ground temperature and permafrost, key fish and marine mammal species, wildlife, and the condition of infrastructure.
- Risk assessments were initiated in relation to wildfires, community and public infrastructure, and wildlife, including species at risk and zoonotic diseases (infectious diseases that are transmitted from animals to humans), to better understand vulnerability to climate change impacts.
- A working group was established to advance an NWT Council on Pests, Pathogens and Invasive Species.
- Updates on permafrost monitoring being led by the Northwest Territories Geological Survey were published on Open Report, an online resource available to the public.
- The NWT Cumulative Impact Monitoring Program (NWT CIMP), which supports the collection, analysis, and

synthesis of traditional knowledge to better understand environmental trends and cumulative impacts to inform decision-making, funded 28 projects in 2019/20. Many of these projects addressed multiple themes within the focus areas of traditional knowledge, water, caribou and fish, all of which related to climate change.

- In May 2019, an NWT Emergency Management Organization Public Awareness Campaign on Emergency Preparedness was launched, as the GNWT continues to work on improving communications with the public regarding important public safety risks related to climate change.
- In July 2019, the NWT released its first ever public health advisory for extreme heat exposure affecting seven communities.
- Engagement with NWT partners and residents on water related programs and initiatives continued in 2019/20, as part of the GNWT's efforts to ensure local, traditional, and scientific knowledge are integrated in climate change research and projects.

### Goal 3: Build Resilience and Adapt to a Changing Climate

This goal focuses on using results obtained from the research and monitoring undertaken in Goal 2 to better manage and adapt to climate change influenced impacts already occurring, and those yet to come. A total of 26 of 28 action items under Goal 3 are underway. There are four action areas under this goal.

#### Highlights for 2019/20 include:

- Enactment of the *Protected Areas Act* in June 2019.
- Establishment of Thaidene Néné Territorial Protected Area in August 2019 as the first area to be formally designated through regulations under the *Protected Areas Act*. Thaidene Néné, situated at the eastern end of Great Slave Lake, is an example of collaboration between multiple partners as it also includes a National Park Reserve, a conservation area under the *Wildlife Act*, and collectively is an Indigenous Protected Area.
- The GNWT and the K'asho Got'ıne signed an establishment agreement for Ts'udé Nilıne Tuyeta Protected Area in September 2019. This area lies west of the Mackenzie River and the community of Fort Good Hope.
- Work progressed towards an establishment agreement for the candidate protected area Dinàgà Wek'èhodì, located on the North Arm of Great

Slave Lake. Protected areas contribute to the protection of diverse ecological and culturally-significant values in the NWT.

- In August 2019, ENR released and began implementation of the Bathurst Caribou Range Plan as well as A Framework for Boreal Caribou Range Planning.
- Significant progress was made on the implementation of the Sustainable Livelihoods Action Plan 2019-2023, which prioritizes ENR's resources and capacity to support climate change adaptation programs that focus on harvesting, traditional economy and country food security across the NWT.
- The Department of Industry, Tourism and Investment (ITI) supported access to agricultural training and expertise to meet regional and community-specific needs, and improve regional and local capacity through the Canadian Agriculture Partnership program. This program will be in place until March 2023.
- The Department of Infrastructure improved monitoring and assessment of existing public infrastructure, such as buildings, highways and airports. This will inform the development of standards, tools and measures to ensure our infrastructure meets the challenges posed by current and future climate conditions.

## CROSS-CUTTING THEMES

The complexity and breadth of climate change requires an integrated and collaborative approach. Across the GNWT, progress has been made to work collaboratively to address climate change. ENR is supporting the establishment of an NWT Climate Change Council, comprised of members from Indigenous governments and organizations (IGOs), which will be initiated in 2020/21 and will provide guidance to the GNWT on climate change actions, including implementation of the Action Plan.

In 2019/20, the GNWT helped strengthen capacity within IGOs and community governments by supporting project proposals and informing funding opportunities through the federal Climate Change Preparedness in the North Program and the federal Indigenous Community-Based Climate Monitoring Program. Workshops, an in-person climate change course, and a webinar series were also delivered through the Department of Municipal and Community Affairs.

## REPORTING RESULTS FOR YEAR 1 – PART 2

Part 2 identifies high priority action areas that require funding and/or additional capacity to proceed. Of the 57 tasks identified in Part 2, 25 were initiated in



*Tundra Ecosystem Research Station at Daring Lake*

2019/20. However, many action areas under Part 2 are not fully resourced and require additional funding or staff to achieve their intended outcomes. Work initiated and conducted under Part 2 action areas will be tracked and reported on in future Action Plan annual reports. Select highlights from initiated action areas in 2019/20 under Part 2 are presented in this report, and progress updates on all initiated action areas are provided in Appendix A.

As the Year 1 report was being drafted, important activities and milestones occurred, such as the October 2020 announcement that the GNWT has secured additional funding for staff and operations and management, which will support Part 2 action areas. This milestone, and others, will be reported on in Year 2 (April 1, 2020 – March 31, 2021).

## MONITORING PROGRESS, RESOURCES EXPENDED, AND LOOKING AHEAD

To support annual reporting, a monitoring and evaluation framework with performance measurement indicators and targets was developed in 2019/20 for the Action Plan. The GNWT will use these indicators and targets to monitor the implementation of the Action Plan from 2019-2023 and evaluate the Action Plan's effectiveness in achieving its goals and cross-cutting themes. The GNWT spent an estimated \$54 million on operations and management (e.g., salaries, contracts, contribution agreements) in Year 1 to implement the Action Plan. This estimate includes federal funding for energy and adaptation related projects as well as staff time.

The first year of implementing the Action Plan has seen several successes. Several challenges were also identified and are being addressed. These challenges include the unique and complex governance structure and authority over land, water and resources in the NWT, the high cost of living and transitioning to alternative energy sources.

The GNWT will provide annual progress reports for the next three years. In 2024, an evaluation and formal review of the CCSF and Action Plan will be conducted to inform potential revisions to the CCSF and the development of the 2025-2029 Action Plan.

# Sommaire

Le gouvernement des Territoires du Nord-Ouest (GTNO) s'est engagé à jouer un rôle de premier plan dans l'atténuation des effets du changement climatique et l'adaptation à ce phénomène sur son territoire.

Le mandat du GTNO pour 2019 à 2023 donne la priorité à l'engagement du gouvernement à s'occuper de l'enjeu du changement climatique, notamment en renforçant le leadership et l'autorité du gouvernement dans le domaine, en veillant à ce que les effets du changement climatique soient expressément pris en considération dans le processus décisionnel du gouvernement ainsi qu'en réduisant le coût de l'électricité et en augmentant le recours aux énergies nouvelles et renouvelables.

Même si le GTNO reconnaît son rôle de chef de file, la collaboration avec ses partenaires est essentielle à la réussite des efforts consentis dans l'atténuation des effets du changement climatique et dans l'adaptation à ceux-ci, notamment pour réduire le coût de l'électricité et augmenter l'utilisation des énergies nouvelles et renouvelables.

Le **Cadre stratégique sur le changement climatique des TNO pour 2030** (CSCC) définit le plan à long terme du GTNO pour lutter contre le changement climatique. **Le Plan d'action pour 2019 à 2023** (Plan d'action) oriente la mise en œuvre du

CSCC et présente un résumé des mesures prioritaires et des domaines de collaboration future avec le GTNO et les partenaires externes. Le CSCC est mis en œuvre parallèlement à la **Stratégie énergétique 2030** (Stratégie énergétique), qui ouvre la voie à l'approvisionnement en énergie plus abordable, plus fiable et plus durable aux TNO, et à la **taxe sur le carbone des TNO**, qui décrit l'approche des TNO pour la tarification du carbone.

Le Rapport annuel 2019/20 sur le Plan d'action sur le changement climatique des TNO (Rapport annuel) documente les progrès accomplis au cours

de la première année de mise en œuvre et de production de rapports sur le Plan d'action. L'objectif du Rapport annuel est de garantir la transparence et la responsabilité du gouvernement en partageant avec le public les informations sur la mise en œuvre.

**Le Plan d'action comporte trois objectifs :**

- **Objectif 1** : Se doter d'une économie saine et forte, où l'utilisation des combustibles fossiles sera diminuée de sorte à réduire l'émission de gaz à effet de serre de 30 % d'ici 2030 (par rapport à 2005);
- **Objectif 2** : Mieux comprendre les effets du changement climatique aux TNO;
- **Objectif 3** : Accroître l'autonomie et s'adapter au changement climatique.

Les deux thèmes transversaux sont d'une part le leadership, la communication et le renforcement des capacités et, d'autre part, les répercussions et les possibilités économiques. Les deux thèmes transversaux sont assortis de mesures qui peuvent s'appliquer aux trois objectifs.

# RAPPORT SUR LES RÉSULTATS DE L'ANNÉE 1 — PARTIE 1

Le Plan d'action comporte deux parties. La partie 1 concerne les travaux en cours ou ceux qui seront lancés et pourvus en ressources au cours de la période 2019 à 2023. Cette partie compte 104 mesures; 96 sont en cours, trois sont achevées et cinq ne sont pas encore mises en branle. Même si cinq mesures ne sont pas encore mises en œuvre, toutes les mesures devraient être réalisées d'ici le 31 mars 2023. Les mises à jour sur l'état d'avancement de chaque mesure de la partie 1 du Plan d'action sont présentées à l'annexe A.

## Objectif 1 : Établir une économie à faibles émissions de carbone

La mise en œuvre de la Stratégie énergétique et de la taxe sur le carbone des TNO sont les principales mesures de l'objectif 1 qui ont pour but de soutenir les TNO dans leur transition vers une économie à faibles émissions de carbone.

### Quelques faits marquants pour 2019/20 :

- Projets de réduction des émissions de gaz à effet de serre (GES) financés grâce au Fonds de modernisation des immobilisations, aux programmes de l'Arctic Energy Alliance et au Programme de subventions publiques pour la réduction des GES entraînant une

réduction de six kilotonnes (kt) d'éq. CO<sub>2</sub> [équivalent dioxyde de carbone].

- Entrée en vigueur de la taxe sur le carbone des TNO le 1er septembre 2019, conformément à l'engagement du GTNO sur la tarification du carbone pris en vertu du Cadre pancanadien sur la croissance propre et les changements climatiques. Il s'agit également d'un engagement pris par le ministère des Finances en regard de l'objectif 1 du Plan d'action. La taxe sur le carbone des TNO augmentera chaque année, passant de 20 dollars la tonne en 2019 à 50 dollars la tonne en 2023.

## Objectif 2 : Mieux comprendre les effets du changement climatique aux TNO

Pour l'année 1, les mesures au titre de l'objectif 2 sont concentrées sur l'utilisation des données compilées, l'élimination des lacunes dans les données de base et l'information ainsi que sur le traitement des données afin de mettre au point des outils pour la prise de décisions. En 2019/20, 51 des 54 mesures liées à l'objectif 2 ont été mises de l'avant. La recherche et la surveillance se sont concentrées sur le pergélisol, l'eau et les milieux humides, la végétation, dont les peuplements forestiers, la faune, dont les poissons et les mammifères marins, la santé et le bien-être humains, la sécurité publique, la culture et le patrimoine ainsi que

les infrastructures publiques et communautaires.

### Quelques faits marquants pour 2019/20 :

- Les ministères du GTNO et les partenaires externes ont poursuivi l'exécution des programmes de surveillance afin d'évaluer les quantités d'eau et de neige, la température du sol et du pergélisol, ainsi que l'état de différents milieux et espèces sauvages (p. ex. forêts, principales espèces de poissons et de mammifères marins), et des infrastructures.
- Des évaluations des risques menaçant les infrastructures communautaires et publiques ainsi que les espèces sauvages, notamment les espèces en péril (p. ex. incendies de forêt), ou les humains (p. ex. les zoonoses, maladies infectieuses transmises des animaux aux humains), ont été entreprises afin que l'on puisse mieux comprendre la vulnérabilité aux effets du changement climatique.
- Un groupe de travail a été créé pour faire avancer le dossier du Conseil des TNO sur les espèces envahissantes, les parasites et les agents pathogènes.
- Des mises à jour sur la surveillance du pergélisol menée par la Commission géologique des Territoires du Nord-Ouest ont été publiées sur Open Report, une

ressource en ligne accessible au public.

- Le Programme de surveillance des effets cumulatifs des TNO (PSECTNO), qui permet de soutenir la collecte, l'analyse et la synthèse du savoir traditionnel afin que l'on puisse mieux comprendre les tendances environnementales et les effets cumulatifs et appuyer la prise de décisions, a financé 28 projets en 2019/20. Nombre de ces projets ont porté sur de multiples thèmes dans les domaines du savoir traditionnel, de l'eau, du caribou et du poisson tous liés au changement climatique.
- En mai 2019, l'Organisation de gestion des urgences des Territoires du Nord-Ouest a lancé une campagne de sensibilisation du public sur la préparation aux situations d'urgence. Le GTNO, quant à lui, continue d'améliorer les communications avec la population concernant les risques importants que le changement climatique fait peser sur la sécurité publique.
- En juillet 2019, les TNO ont émis leur tout premier avis de santé publique concernant l'exposition à la chaleur extrême qui touchait sept collectivités.
- L'engagement avec des partenaires et des Ténos dans les programmes et les initiatives liés à l'eau s'est poursuivi en 2019/20 dans le cadre des efforts du GTNO pour garantir que le savoir local, traditionnel et

scientifique est intégré à la recherche et aux projets liés au changement climatique.

### **Objectif 3 : Accroître l'autonomie et s'adapter au changement climatique.**

Pour réaliser cet objectif, on devra mieux gérer les effets actuels et à venir du changement climatique et s'y adapter. On se servira pour cela des résultats obtenus grâce à la recherche et à la surveillance mises en œuvre pour atteindre l'objectif 2. Au total, 26 des 28 mesures prévues pour atteindre l'objectif 3 sont en cours. Cet objectif est associé à quatre domaines d'action.

#### **Quelques faits marquants pour 2019/20 :**

- Promulgation de la *Loi sur les aires protégées* en juin 2019.
- Création de l'aire protégée territoriale Thaidene Néné en août 2019 en tant que première aire à être officiellement désignée par des règlements en vertu de la *Loi sur les aires protégées*. L'aire de Thaidene Néné, située à l'extrémité est du Grand lac des Esclaves, est un exemple de collaboration entre de multiples partenaires, car elle comprend également une réserve de parc national, une aire de conservation en vertu de la *Loi sur la faune* et, collectivement, est une aire protégée autochtone.
- Le GTNO et le K'asho Got'ıneq ont signé un accord de création de l'aire protégée de Ts'udé Nilıne Tuyeta en

septembre 2019. Cette aire se trouve à l'ouest du fleuve Mackenzie et de la communauté de Fort Good Hope.

- Les travaux ont progressé vers l'accord de création de l'aire protégée proposée Dinàgà Wek'èhodı, dans le bras nord du Grand lac des Esclaves. Les aires protégées contribuent à la protection de divers actifs écologiques et culturels importants aux TNO.
- En août 2019, le ministère de l'Environnement et des Ressources naturelles (MERN) a publié et commencé à mettre en œuvre le Plan pour l'aire de répartition des caribous de Bathurst, ainsi que le Cadre de planification de l'aire de répartition du caribou boréal.
- Des progrès importants ont été accomplis dans la mise en œuvre du Plan d'action sur les moyens de subsistance durables pour 2019 à 2023, qui donne la priorité aux ressources et à la capacité du MERN à soutenir des programmes d'adaptation au changement climatique qui se concentrent sur l'économie traditionnelle et la stabilité de l'approvisionnement en aliments traditionnels partout aux TNO.
- Le ministère de l'Industrie, du Tourisme et de l'Investissement (MITI) a soutenu l'accès à la formation et à l'expertise agricoles pour combler les besoins particuliers des régions et des collectivités et améliorer les capacités régionales et



Station de recherche sur l'écosystème de la toundra au lac Daring

locales par l'intermédiaire du Partenariat canadien pour l'agriculture. Ce programme sera en place jusqu'en mars 2023.

- Le ministère de l'Infrastructure a amélioré la surveillance et l'évaluation d'infrastructures publiques comme les immeubles, les routes et les aéroports. Cette amélioration contribuera à l'élaboration de normes, d'outils et de paramètres pour adapter les infrastructures aux conditions climatiques actuelles et futures.

## THÈMES TRANSVERSAUX

La complexité et l'ampleur du changement climatique exigent l'adoption d'une approche intégrée et collaborative. Des

progrès de collaboration à la lutte contre le changement climatique ont été réalisés dans l'ensemble des TNO. Le MERN soutient la création d'un Conseil sur le changement climatique des TNO composé de représentants des gouvernements et des organisations autochtones et qui entrera en scène en 2020/21 afin d'orienter le GTNO sur le choix des mesures à prendre au regard du changement climatique, y compris la mise en œuvre du Plan d'action.

En 2019/20, le GTNO a contribué à renforcer les capacités des gouvernements et des organisations autochtones ainsi que des gouvernements communautaires en soutenant des projets et en fournissant de l'information sur les possibilités de financement par l'intermédiaire du programme. Se préparer au changement

climatique dans le Nord et du Programme de surveillance du climat par les communautés autochtones. Le ministère des Affaires municipales et communautaires a aussi organisé des ateliers, un cours en personne sur le changement climatique et une série de webinaires.

## RAPPORT SUR LES RÉSULTATS DE L'ANNÉE 1 — PARTIE 2

La partie 2 dresse la liste des domaines d'action hautement prioritaires qui doivent voir augmenter le financement ou les capacités pour que le travail démarre. Sur les 57 tâches recensées dans la partie 2, 25 ont été entreprises en 2019/20. Toutefois, pour de nombreux domaines d'action de la partie 2,

les ressources, le financement ou l'effectif sont insuffisants pour que l'on puisse atteindre les résultats escomptés. Les travaux lancés et menés dans le cadre des domaines d'action de la partie 2 feront l'objet d'un suivi et de mises à jour dans les futurs rapports annuels sur le Plan d'action. L'actuel rapport présente certains faits saillants des domaines d'action décrits dans la partie 2 et qui ont été mis de l'avant en 2019/20, tandis que l'annexe A présente des mises à jour sur les progrès réalisés dans tous les domaines d'action où le travail a commencé.

Au moment de la rédaction du rapport de la première année, des activités avaient été réalisées et des étapes importantes franchies; par exemple, le financement supplémentaire pour l'effectif, les opérations et la gestion afin de soutenir les domaines d'action de la deuxième partie, annoncé en octobre 2020 par le GTNO. Ce jalon et d'autres étapes importantes feront l'objet d'une mise à jour au cours de la deuxième année (du 1er avril 2020 au 31 mars 2021).

## SUIVI DES PROGRÈS, RESSOURCES UTILISÉES ET PERSPECTIVES

Pour alimenter les rapports annuels, un cadre de suivi et d'évaluation assorti d'indicateurs et d'objectifs de mesure du rendement a été élaboré en 2019/20 pour chaque mesure du Plan d'action. Le GTNO utilisera ces indicateurs et ces objectifs pour suivre la mise en œuvre du Plan d'action pour 2019 à 2023

et évaluer son efficacité dans l'atteinte des objectifs établis et l'exploitation des thèmes transversaux.

Le GTNO a dépensé environ 54 millions de dollars en fonctionnement et en gestion (p. ex. salaires, contrats, accords de contribution) au cours de la première année pour la mise en œuvre du Plan d'action. Cette estimation comprend le financement fédéral pour les projets liés à l'énergie et aux mesures d'adaptation, ainsi que le temps du personnel.

La première année de la mise en œuvre du Plan d'action a été marquée par plusieurs réussites. Plusieurs problèmes ont aussi été relevés et sont en train d'être réglés. Ces problèmes concernent notamment les particularités et la complexité de la structure de gouvernance et de l'exercice de pouvoirs sur les terres, l'eau et les ressources aux TNO, le coût élevé de la vie et la transition vers de nouvelles sources d'énergie. Le GTNO produira des mises à jour sur ces questions au cours des trois prochaines années. En 2024, on effectuera l'évaluation et l'examen officiel du CSCC et du Plan d'action pour fonder d'éventuelles révisions du CSCC et l'élaboration du Plan d'action pour 2025 à 2029.



# 1.0 Introduction

Climate change is impacting NWT's natural environment, the health and safety of its residents, culture and heritage, infrastructure, and the economy.

Climate change is one of the most serious environmental, economic and political challenges of our time and requires meaningful action. The GNWT recognizes the importance of mitigating and adapting to climate change in collaboration with other governments, businesses and non-governmental organizations (NGOs).

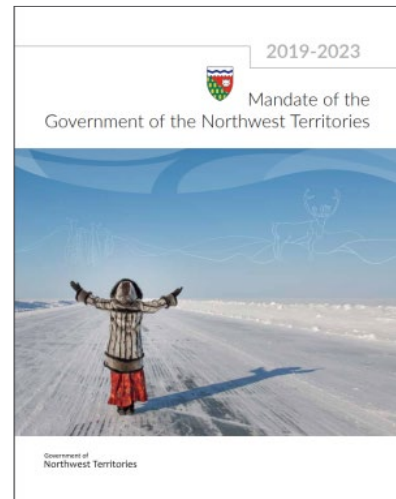
The GNWT is committed to providing strong leadership towards effective climate change mitigation and adaptation activities. This commitment is highlighted in the CCSF which sets out our government's long-term plan for addressing climate change. It is also highlighted in the GNWT's Energy Strategy, which sets out a path to more affordable, secure and sustainable energy in the NWT, and the NWT approach to carbon pricing set out in the NWT Carbon Tax.

The **Mandate of the Government of the Northwest Territories (2019-2023)** (the Mandate) further reinforces the GNWT's commitment to addressing climate change issues. The Mandate includes priorities to

strengthen the government's leadership and authority on climate change, ensure climate change impacts are specifically considered when making government decisions, and reduce the cost of power and increase the use of alternative and renewable energy.

The CCSF was released in May 2018. It outlines a long-term (2018-2030) vision towards a strong, healthy economy that is less dependent on fossil fuels, while at the same time developing the knowledge, tools and measures needed to increase our resilience and adapt to the changing northern climate. Figure 1 illustrates the GNWT's approach to achieving the vision of the CCSF. Under the CCSF, the GNWT is focusing on three climate change goals and two cross-cutting themes:

1. Transition to a lower carbon economy
2. Improve knowledge of climate change impacts
3. Build resilience and adapt to a changing climate



The two cross-cutting themes include actions that apply to all three goals. The two themes are focused on leadership, communication and capacity-building and understanding the economic impacts and opportunities resulting from climate change. They have been combined under one heading to simplify reporting.



## 2030 NWT CLIMATE CHANGE STRATEGIC FRAMEWORK 2019-2023 Action Plan

### CADRE STRATÉGIQUE SUR LE CHANGEMENT CLIMATIQUE DES TNO 2030 Plan d'action 2019-2023

Le présent document contient la traduction française du résumé

The Action Plan was released in April 2019 and guides the implementation of the CCSF for the first five years. The Action Plan presents a summary of priority actions that are currently under way, as well as areas for future collaboration to address the three goals and two cross-cutting themes of the CCSF.

The Annual Report ensures public transparency and accountability by keeping residents informed of the progress, key next steps,

partnerships and contributions that support the implementation of the CCSF for the period of April 1, 2019, to March 31, 2020.

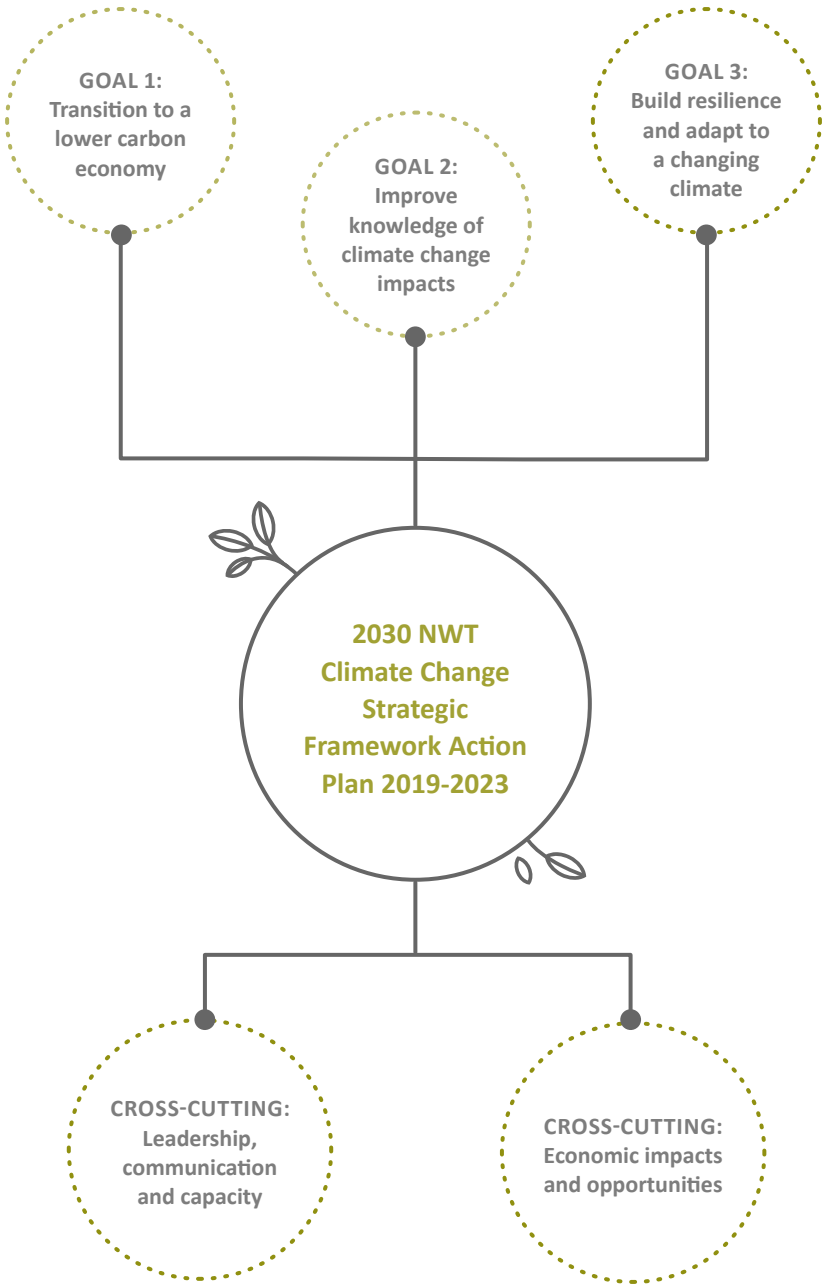
The Action Plan is divided into three parts:

- Part 1 Actions: Contains 104 action items that are resourced and either underway or anticipated to begin within the 2019-2023 timeframe.
- Part 2 Areas for Future Collaboration: Identifies 28 critical and high priority action areas made up of 57 tasks that require additional resources to

be initiated. Significant federal investment and funding are required, as well as support from the GNWT, academia, NGOs and industry to advance the action areas identified.

- Part 3 Implementation, Reporting and Measuring Progress: Outlines the steps needed to implement, report and measure progress on the Action Plan.

FIGURE 1. OVERVIEW OF GOALS AND CROSS-CUTTING THEMES IN THE ACTION PLAN



## OUR PARTNERS

### NWT PARTNERS:

Indigenous governments and organizations

Community governments

Northwest Territories Association of Communities

Co-management boards

Industry

Non-governmental organizations

Public

### FEDERAL DEPARTMENTS:

Crown-Indigenous Relations and Northern Affairs Canada

Environment and Climate Change Canada

Fisheries and Oceans Canada

Indigenous Services Canada

Natural Resources Canada

Parks Canada Agency

### OTHER GNWT DEPARTMENTS:

Education, Culture and Employment Executive and Indigenous Affairs

Finance

Health and Social Services

Industry, Tourism and Investment

Infrastructure

Lands

Municipal and Community Affairs



JOHN MCKAY

## IMPORTANCE OF PARTNERSHIPS

While the GNWT recognizes its leadership role as outlined in the CCSF and Action Plan, the responsibility for taking action on climate change is shared with our partners, including NWT residents. It is critical that the GNWT works together with all Northerners to ensure our way of life that is closely tied to the land can continue in a changing climate. Collaboration with our partners is integral to the NWT's success in mitigating and adapting to the effects of climate change. The collective wisdom of partners, including traditional, local and scientific knowledge, will help guide the territory's response to climate change.

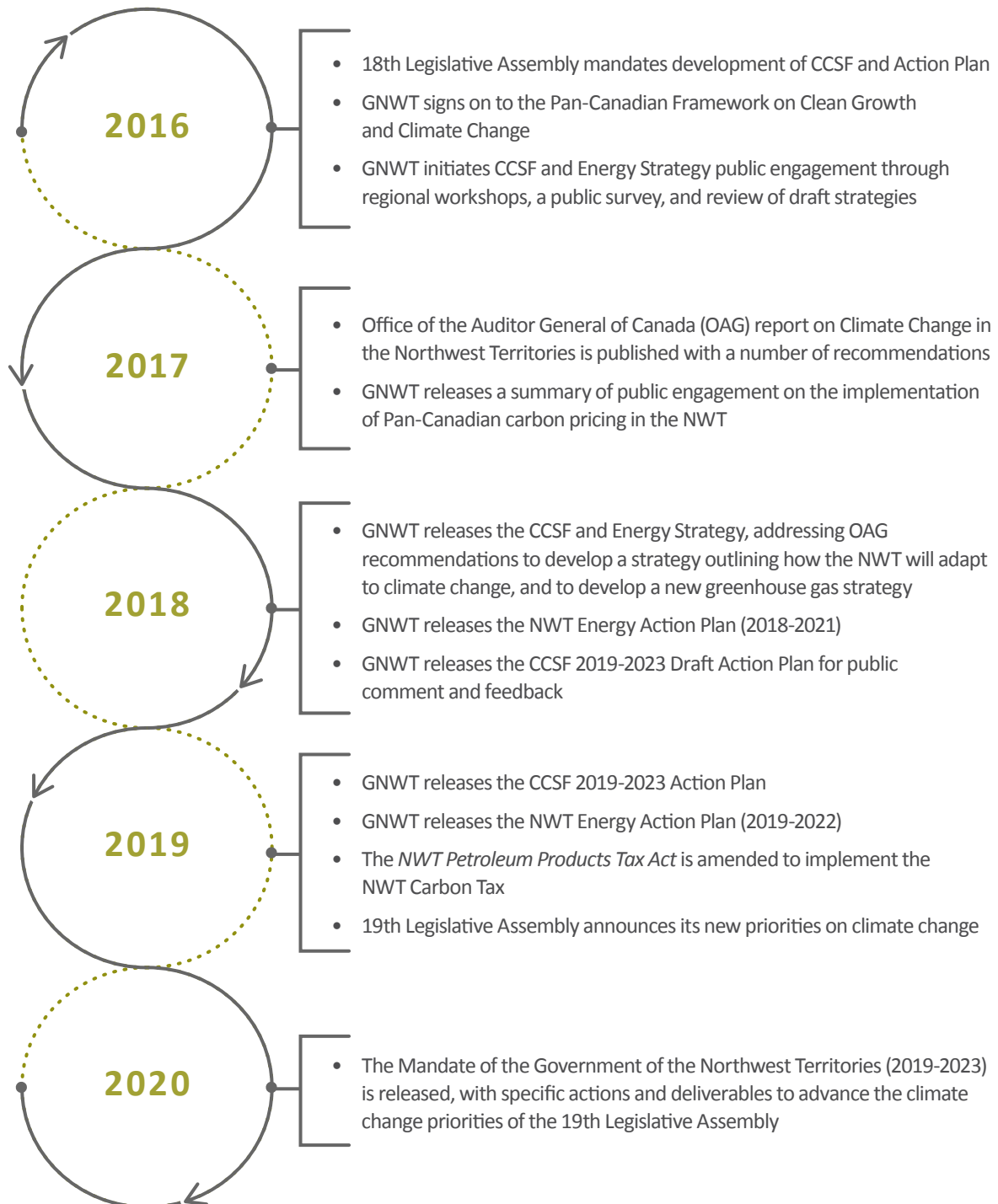
Environment and Natural Resources (ENR) is the lead GNWT department for addressing climate change. ENR is responsible for overseeing the implementation of the CCSF and

Action Plan, and coordinates progress reporting annually for all GNWT and partner-led actions identified in the Action Plan. Although ENR is the overall lead, addressing climate change is a cross-governmental priority, drawing together GNWT departments, IGOs, community governments, and external partners to work collaboratively. The Department of Infrastructure (INF) implements the Energy Strategy and the Department of Finance (FIN) implements the NWT Carbon Tax.

To meet the goals set out in the Action Plan, the GNWT requires the ongoing support and commitment of its internal and external partners (see sidebar). For further information on each partner, please see Appendix C of the Action Plan.

## EVOLUTION OF GNWT CLIMATE CHANGE POLICY, 2016-2020

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*A barge cruises on the Mackenzie River, near Fort Good Hope*

## 1.1 Purpose of the Action Plan

The Action Plan guides the implementation of the CCSF over the first five years. It summarizes significant actions underway and the areas for future collaboration needed to address climate change in the NWT. Each year, the Annual Report will demonstrate the progress made on Part 1 and 2 actions identified within the Action Plan.

The annual review and reporting allows the GNWT and its partners to demonstrate progress in a transparent and accountable manner to the residents of the NWT. Progress highlights

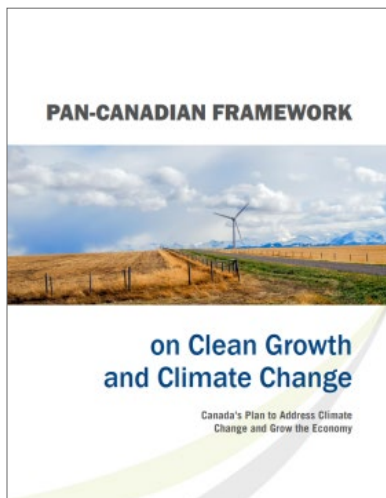
for each goal and for cross-cutting themes are described in sections 2 and 3, and progress on each action item is documented in Appendix A.

Since 1948, annual average temperatures across northern Canada have increased by 2.3°C. This is causing significant changes in the natural environment. In the Mackenzie Delta, Inuvik has warmed by about 5°C in the same time period. Observed changes include thawing and degradation of permafrost, shorter winters, longer and drier summers, shrinking sea ice, and coastal erosion. These changes impact water quality and quantity, species, ecosystems, Indigenous cultures, transportation infrastructure, buildings, some economic activities and the health and well-being of residents.<sup>1</sup>

<sup>1</sup> Information retrieved from Zhang, X., Flato, G., Kirchmeier-Young, M., Vincent, L., Wan, H., Wang, X., Rong, R., Fyfe, J., Li, G., Kharin, V.V. (2019): *Changes in Temperature and Precipitation Across Canada*; Chapter 4 in Bush, E. and Lemmen, D.S. (Eds.) *Canada's Changing Climate Report*. Government of Canada, Ottawa, Ontario, pp 112-193.

# 1.2 Link to the Pan-Canadian Framework on Clean Growth and Climate Change Commitments

The Pan-Canadian Framework on Clean Growth and Climate Change (PCF) is the Government of Canada's plan to grow the national economy while reducing national greenhouse gas (GHG) emissions and building resilience to adapt to a changing climate.



The GNWT became a signatory to the PCF in 2016. The pillars of the PCF are: pricing carbon pollution, taking actions to reduce emissions, taking actions to adapt to current and future climate impacts, and investing in clean technology, innovation and jobs to ensure that society thrives in a changing climate.

These broad objectives of the federal government are similar to those of the GNWT, and are reflected in the three goals of the CCSF and the two cross-cutting themes. The timeline of the CCSF

and Energy Strategy align with the PCF, spanning 12 years to encompass the long-term actions required to address climate change and achieve federal GHG targets by 2030.

The most significant link between the PCF and the CCSF and Energy Strategy is the importance of climate change mitigation through the reduction of GHG emissions. Consistent with the PCF, the GNWT has committed to reduce GHG emissions to 30% below 2005 levels by 2030.

# 1.3 Key linkages to the 2030 Energy Strategy and NWT Carbon Tax

The CCSF and Action Plan are being implemented in tandem with the 2030 Energy Strategy and the NWT Carbon Tax (see Figure 2). The implementation of these interconnected actions will help the NWT transition to a lower carbon economy, and will contribute significantly to meeting the GHG reduction target.

Updates on activities under the Energy Strategy and NWT Carbon Tax are detailed in the NWT

Energy Initiatives Report 2019/20 and NWT Carbon Tax Report 2019/20, and summarized in Section 2.1 of this report. The departments of ENR, INF and FIN are working collaboratively to ensure coordination and implementation of these initiatives, which are key action items under Goal 1. All three reports are summarized and reported on together in the Plain Language Overview Report 2019/20.

## ADDRESSING THE OFFICE OF THE AUDITOR GENERAL OF CANADA REPORT ON CLIMATE CHANGE

In October 2017, the Office of the Auditor General (OAG) of Canada submitted its report, Climate Change in the Northwest Territories, to the Legislative Assembly. The OAG report contained specific recommendations that have been incorporated in the CCSF. The CCSF, Energy Strategy, and accompanying action plans were key documents released in response to the OAG recommendations.

Throughout the Action Plan, action items that address OAG recommendations are noted. Updates on the action items being implemented to address OAG recommendations are highlighted in Appendix A.

# 1.4 Key linkages to Mandate Items

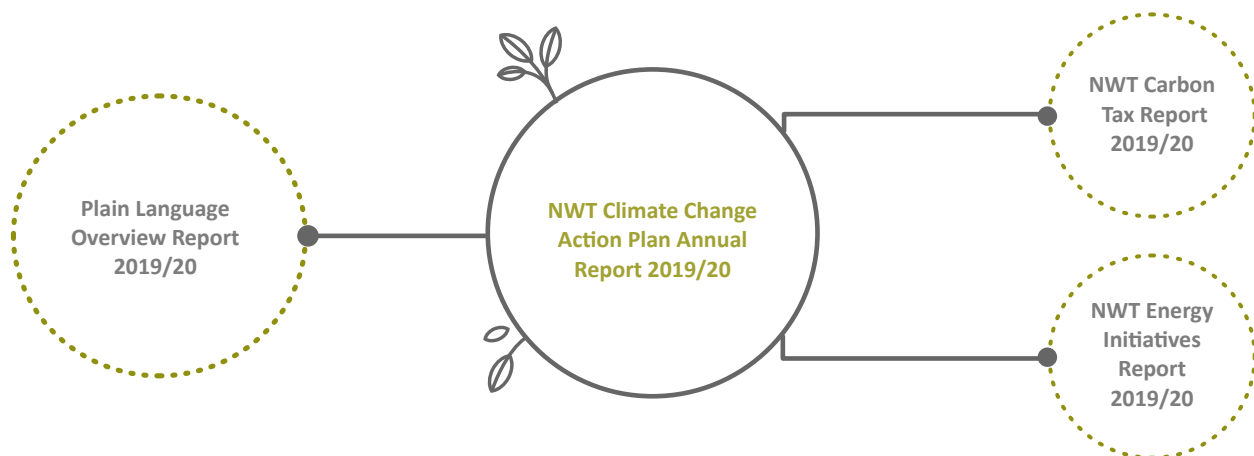
The Mandate outlines three priorities relating to climate change:

- Strengthen the government's leadership and authority on climate change,
- Ensure climate impacts are considered when making government decisions, and
- Reduce the cost of power and increase the use of alternative and renewable energy.

The Mandate demonstrates the GNWT's commitment to provide action, leadership and authority on climate change issues by considering the full range of climate change impacts. These include changes in the natural environment, the associated increase in needs and costs related to

infrastructure, concerns related to human health, food security, cultural well-being, and potential economic impacts and opportunities related to climate change. A key step in strengthening the government's leadership and authority on climate change is to implement the CCSF, Energy Strategy and NWT Carbon Tax.

FIGURE 2. NWT CLIMATE CHANGE ACTION PLAN REPORT 2019/20 COMPONENTS







*The northern lights near Pontoon Lake on the Ingraham Trail*

## NWT CLIMATE CHANGE COUNCIL

The GNWT recognizes the key roles IGOs, community governments, and other external partners have in responding to climate change. Within the Mandate, the GNWT committed to demonstrating progress on improving coordination and communication for climate change by establishing an NWT Climate Change Council.

*What is the purpose of the NWT Climate Change Council?*

The Council will inform GNWT leadership on climate change, including the implementation of the Action Plan. The core of the Council will be formed by IGOs, with the potential for advisory panels consisting of youth, Elders and external partners.

An initial Council planning meeting with Indigenous leadership and support staff was scheduled for March 19, 2020. The meeting was rescheduled to August 2020 due to COVID-19.

# 2.0 Reporting Results – Summary of Action Item Progress to Date

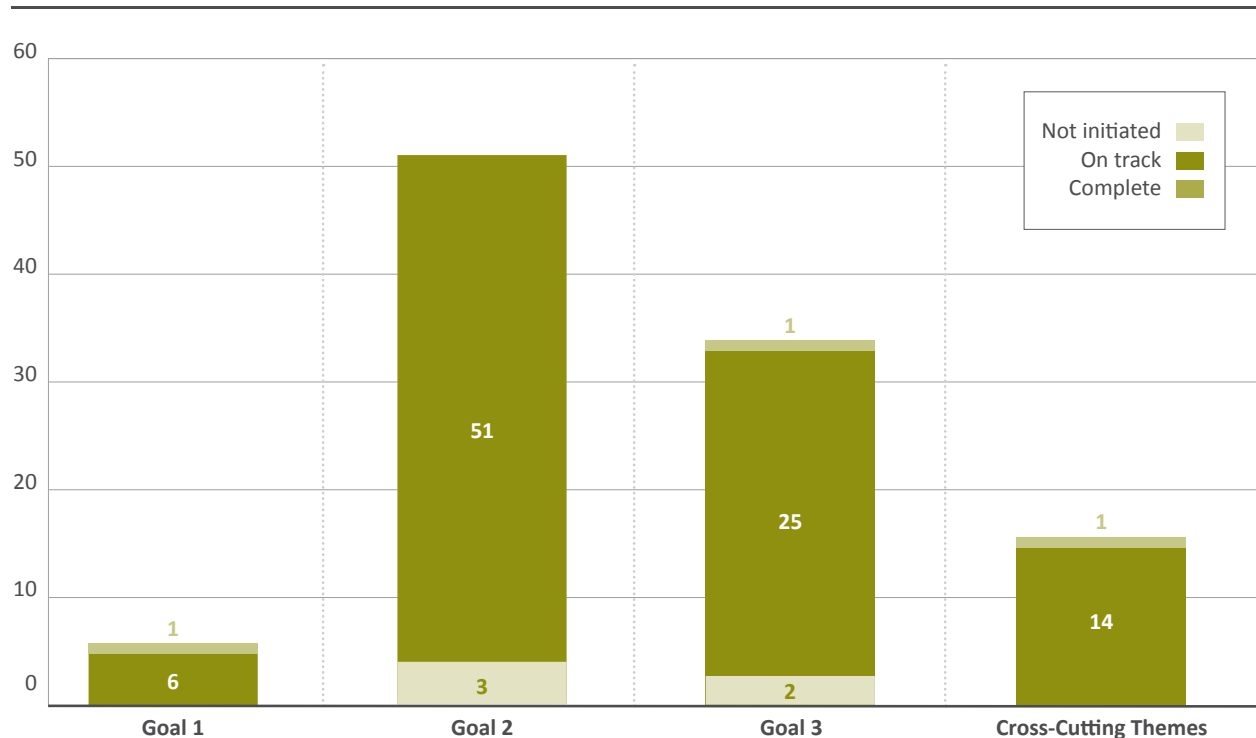
The Action Plan is divided into two parts, each with three goals and two cross-cutting themes. There are a total of 104 resourced action items in Part 1. This section provides an update on the progress and milestones of Part 1 action items during the first year of implementation from April 1, 2019 to March 31, 2020.

In Year 1, 96 Part 1 action items are on track to be completed by 2023, three are complete, and five are yet to be initiated (Figure 3). All Part 1 action items are expected to be completed within the 2019-2023 timeframe. Highlights of selected progress and milestones are outlined in this section. A detailed table with a status update on all

action items can be found in Appendix A. Two of these action items (2.1C and 2.9D) have not been initiated as they require the establishment of councils (the NWT Climate Change Council and the NWT Pests, Pathogens and Invasive Species Council, respectively). Both councils will provide guidance on

the activities and efforts to complete the action items. Action items 2.2A and 3.3D have not been initiated as work has instead been focused on the new *Protected Areas Act* and the establishment of three protected areas. Lastly, 3.1B was not scheduled to start in 2019-2020; work will begin in 2020-2021.

FIGURE 3. STATUS OF PART 1 ACTION ITEMS BY GOAL AND CROSS-CUTTING THEME



# 2.1 Goal 1: Transition to a Lower Carbon Economy

The implementation of the Energy Strategy and the NWT Carbon Tax are the primary ways the GNWT will achieve Goal 1, transitioning to a lower carbon economy and reducing GHG emissions.

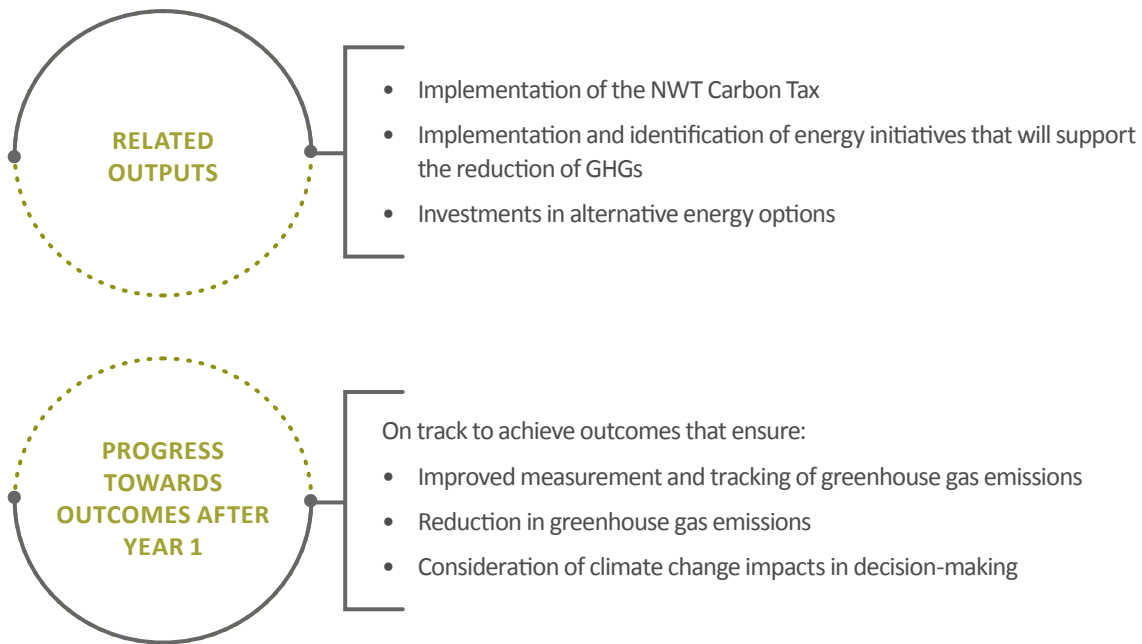
In Year 1 of implementing the Action Plan, many important steps have been taken to better understand, track and report on GHG emissions. This will

improve measuring progress to meet the GNWT commitment, under the PCF, to reduce to reduce GHG emissions to 2005 levels.

We are also examining ways to mitigate climate change in the licensing and permitting of resource development and other projects.

## OUTCOMES SUMMARY

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# 2.1.1 2030 Energy Strategy Implementation

## RELATED ACTION ITEM: 1.1A

The implementation of the Energy Strategy is led by INF and its partners, which include the federal government, NWT Power Corporation and Arctic Energy Alliance. In total, the GNWT and its partners invested approximately \$25.84 million to implement the Energy Strategy in 2019/20 to reduce emissions while ensuring the NWT has access to secure and affordable energy.

Highlights include continued progress to upgrade and refurbish the NWT's existing hydroelectric generating facilities

in the Snare and Taltson electric grids, and ongoing planning for other large capital projects such as transmission lines. Examples of successful GHG emissions reduction initiatives include the Capital Asset Retrofit Fund resulting in a 3.8kt CO<sub>2</sub>e decrease in emissions, Arctic Energy Alliance programs resulting in a 1.4 kt CO<sub>2</sub>e decrease, and GHG Grant Program projects resulting in a 0.5 kt CO<sub>2</sub>e decrease. For more details on these and other programs and initiatives underway, please see the Energy Initiatives Report 2019/20.

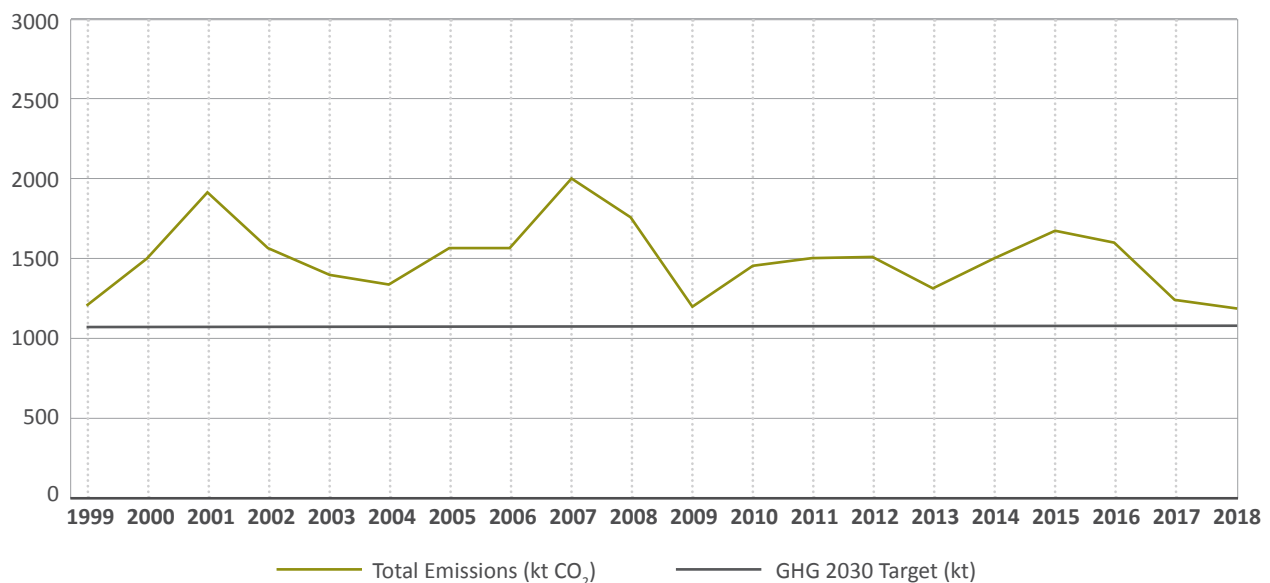
Figure 4 shows the NWT's historical annual GHG emissions. For 2018, the most recent year for

which data are available, the NWT's annual emissions were 1,260 kt CO<sub>2</sub>e. There has been a decline in emissions since 2015 and the NWT is striving to meet its 2030 GHG target of a 30% reduction from 2005 levels (1,094 kt).

### CO<sub>2</sub>e

Carbon dioxide equivalent is a measure used to compare the emissions from various greenhouse gases based upon their global warming potential.

FIGURE 4. HISTORICAL NWT GREENHOUSE GAS EMISSIONS (1999-2018)





Solar panels in Paulatuk

## 2.1.2 NWT Carbon Tax Implementation

### RELATED ACTION ITEM: 1.1B

NWT carbon pricing is led by FIN. The NWT Carbon Tax was implemented on September 1, 2019. The NWT Carbon Tax meets the GNWT's commitment on carbon pricing under the Pan-Canadian Framework on Clean Growth and Climate Change and fulfills action item 1.1B to implement carbon pricing in the NWT. The tax started at \$20 per tonne of GHG emissions and will increase annually until 2022, when it will reach \$50 per tonne of GHG emissions for various types of fuel. Aviation fuel will be exempted.

The GNWT's carbon pricing approach is intended to encourage carbon conservation and substitution to reduce GHG emissions while minimizing the effect on the local cost of living and avoiding creating additional barriers to economic development. Carbon tax offset expenditures are set out in the *Petroleum Products and Carbon Tax Regulations*, with the exception of Cost of Living Offset, which can be found under provincial and territorial programs on the Government of Canada website.

The GNWT has made priority investments in alternative energy options for territorial

residents and businesses to provide reliable, affordable alternatives to carbon-intensive fuels and will continue to work closely with internal and external partners to make priority investments. Since fuel usage changes annually due to factors like weather, economic activity and new technology, conclusions about the direct contribution of carbon pricing cannot be clearly drawn at the end of Year 1. ENR and FIN will report collaboratively on year-over-year comparisons in future annual reports. For more detailed information on carbon pricing and implementation, please see the NWT Carbon Tax Report 2019/20.

## 2.1.3 Other Actions to Support a Transition to a Lower Carbon Economy

### RELATED ACTION ITEMS: 1.2A, 1.2B, 1.4A, 1.4B

#### Improving tracking and reporting of GHG emissions

For the GNWT to meet its PCF commitments and reduce emissions by 30% from 2005 levels by 2030, it is critical to track and accurately report on GHG emissions for the entire NWT. In 2019/20, ENR worked with Environment and Climate Change Canada (ECCC) to better align how the GNWT and ECCC calculate emissions.

Improving internal GHG emissions tracking and reporting is also important for the GNWT to understand and reduce its emissions. In 2019/20, ENR and INF developed a memorandum of understanding with the Northwest Territories Power Corporation (NTPC) to facilitate the transfer of data to ENR to improve GNWT GHG emission calculations. The memorandum of understanding is expected to be signed in 2020/21. The GNWT has also been working internally to improve the way utility and fuel data are tracked.

#### Incorporating climate change in environmental impact assessment and regulatory processes

Addressing climate change in environmental assessment and licensing/permitting of resource development and other projects allows regulators, developers, decision-makers and stakeholders to have a better understanding of a project's contribution to climate change. It also allows for early and ongoing opportunities to incorporate the potential mitigation and adaptation responses to climate change required during a project's life cycle.

In 2019-2020, the **Mackenzie Valley Environmental Impact Review Board** (Review Board) finalized a perspectives paper, **Evolving Environmental Impact Assessment in the Mackenzie Valley and Beyond** (released April 2020). This paper outlines the Review Board's intent to improve and strengthen the consideration of climate change in environmental assessment, along with other topics. This includes the need to consider climate change resilience and adaptability of projects, improving GHG

accounting and ways to minimize these emissions, and the consideration of carbon policy and best practices in Canada.

In addition to contributing to the Review Board's perspectives paper, the GNWT continues to develop and enhance the way climate change considerations are provided to the Review Board, Environmental Impact Review Board (Inuvialuit), and other regulatory boards in regulatory submissions.



*An elder from Fort Good Hope talks with an ENR biologist at a cabin along the Rampart River*

## 2.2 Goal 2: Improve Knowledge of Climate Change Impacts

With Goal 2 representing over half the actions in Part 1, much of the focus in Year 1 of implementation was on planning, management and use of information generated through research and monitoring. Understanding how climate change impacts the natural environment, human health and well-being, public

safety, culture and heritage, and infrastructure is essential to develop the tools necessary to support climate resilience in the future. Out of 54 action items related to Goal 2, 51 were started in 2019-2020.

In Year 1 of implementing the Action Plan, many important steps have been taken to

improve our knowledge of climate change impacts, including:

- Establishing research partnerships that will help fill knowledge gaps
- Acquiring baseline data and information
- Processing and assessing the data or information

# 2.2.1 Planning, Management and Use of Information

## RELATED ACTION ITEMS: 2.1A, 2.1B, 2.1D, 2.1E, 2.3A, 2.3B, 2.4A, 2.4B, 2.4D

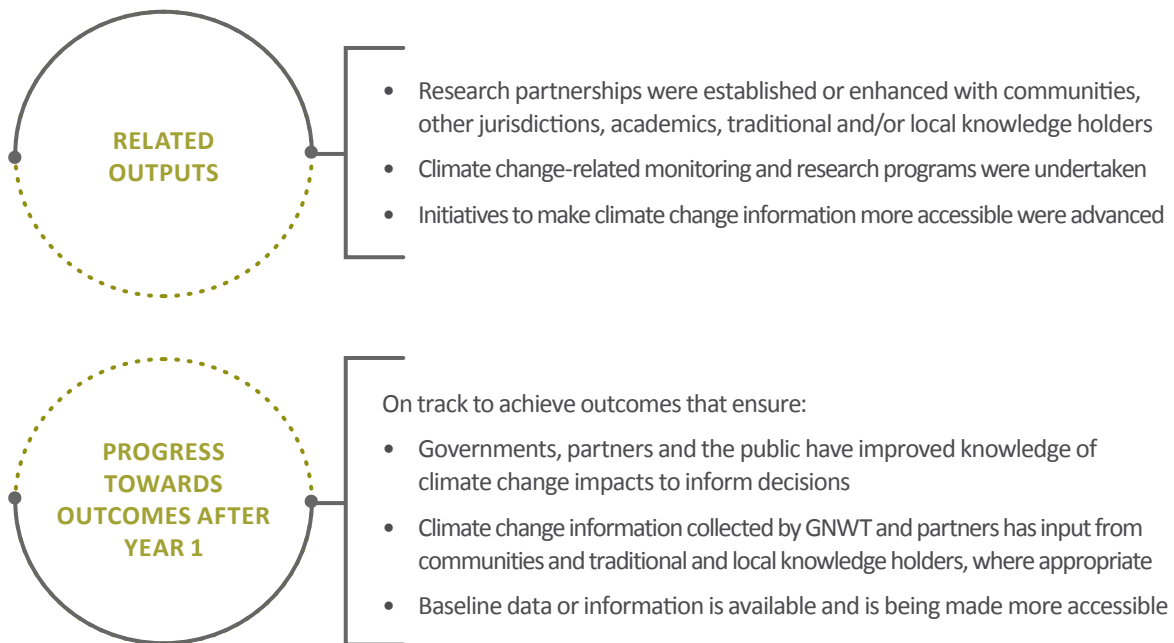
The GNWT and its partners have made progress in acquiring and processing baseline data or information, and the assessment of the information.

The intent is for the work from Year 1 to be built upon in future years. Ongoing identification and collection of baseline data and information needs will

provide continual enhancement and development of tools to support the integration of climate change considerations in GNWT decision making.

### OUTCOMES SUMMARY

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**IN AUGUST 2019,  
TUKTOYAKTUK  
SCIENCE DAY WAS HELD.**

Supported by ENR, the event was aimed at drawing attention to the impacts of climate change in the NWT and the Beaufort-Delta region, as well as the community's research needs. The event brought together federal research funders, regional IGOs and the Tuktoyaktuk Community Corporation. Tuktoyaktuk residents, particularly youth, had plenty to say about climate change and its impact on their community.

DAN ANTHON



*An elder examines a poster at Tuktoyaktuk Science Day – August 2019*

**Supporting the GNWT  
Knowledge Agenda  
– climate change research**

The GNWT Knowledge Agenda identifies key themes to focus GNWT research on NWT interests, improve the quality of life of residents, and maintain the integrity of NWT cultures, communities and ecosystems.

In June 2019, the GNWT released the **GNWT Knowledge Agenda: Action Plan 2019-2024**, which identifies climate change research as a key cross-cutting theme. To support its implementation, the GNWT leverages existing research

programs to encourage community-based participation through the development of partnerships with academic institutions. The GNWT also supports interdisciplinary research that addresses economic, health, social and environmental issues related to climate change.

The GNWT continues to strengthen and enhance partnerships with communities and academics. ENR actively participates in research networks, such as Arctic Net and the Canadian Mountain Network. Throughout 2019/20,

GNWT departments and Canadian research funders came together to promote northern climate change-focused research, emphasizing the need for partnerships with IGOs and communities. One notable accomplishment was the renewal of the GNWT-Laurier partnership (with Wilfrid Laurier University). This renewed partnership resulted in two new Canada Research Chairs that will focus their research efforts on the NWT, including a remote sensing specialist to focus on climate change impacts on NWT lakes.



*Guardians from Fort Good Hope preparing for safety certification*

### Supporting conservation network planning

A conservation network contributes to stronger collective ecological, economic and social stability, ensuring that the landscape is connected by providing corridors to reproductive areas for wildlife. This supports species migration and adaptation. To advance a renewed strategy for conservation network planning in the NWT, ENR hosted a Conservation Network Gathering in Yellowknife in February 2020. The event brought together more than 100 participants, including Indigenous leaders, federal

and territorial governments, academia, non-governmental organizations, and conservation leaders from across Canada, to exchange knowledge, build partnerships and nurture collaboration. Climate change-focused topics were discussed throughout the gathering, which will inform the development of renewed conservation network planning. The renewed planning document will be released for public engagement in 2021.

Alongside the gathering, a workshop was delivered to explore the development of climate change vulnerability assessments for established

and future territorial and Indigenous protected areas in the NWT. These assessments are important as they will help Northerners understand the potential future risks posed by climate change for these areas. This work will continue in 2020/21.



Members of K'at'l'odeeche First Nation work alongside a scientist to measure and record fish data

### Enhancing the use of traditional and local knowledge

Informed climate change research, monitoring, mitigation and adaptation actions depend on appropriate and respectful collection and use of traditional and local knowledge, in addition to robust scientific knowledge.

To improve knowledge of climate change impacts, NWT CIMP is supporting a project in Délı̄ne, focused on

collecting and cataloguing traditional knowledge about key environmental and cultural aspects of Great Bear Lake and its watershed. This includes knowledge about changes to fish, water, wildlife and the land caused by climate change and development. The information gathered will allow the community and decision-makers to assess the impacts of past, present and future development on the Great Bear Lake watershed.

Numerous IGOs are leading traditional knowledge research and programs to better understand impacts of climate change to support decision-making in specific communities and regions. The federal Climate Change Preparedness in the North and Indigenous Community-based Climate Monitoring programs supported several traditional knowledge focused projects in 2019/20.

### Improving management and use of data and information

In 2019/20, ENR conducted an inventory and preliminary evaluation of NWT environmental data and data products to support climate change actions. This included tracking how GNWT data and information was collected and stored, as well as documenting climate change-related data and information needs and gaps.

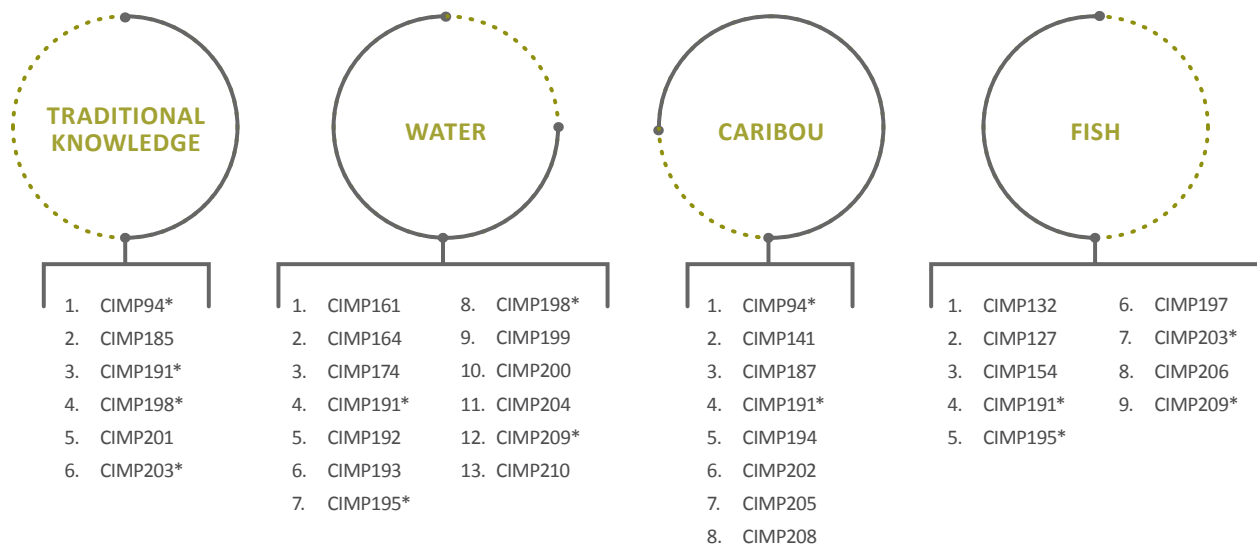
Understanding the gaps and improving data management processes will help to increase internal and external sharing of climate change data.

Steps towards the development of a GNWT Climate Change Portal were taken in 2019/20. The Climate Change Portal will meet both internal and external user needs and help facilitate the dissemination of climate change results and products

from one central location. A scan of other central online resources took place in 2019/20, as well as the collection and review of feedback from data and information collectors on the role and benefits of a portal. A potential candidate platform to share information was identified by ENR and business case development was initiated in 2019/20. Work will continue in 2020/21 to develop and implement the portal.

The Northwest Territories Cumulative Impact Monitoring Program (NWT CIMP) coordinates, conducts and funds the collection, analysis and reporting of information related to environmental conditions, particularly cumulative impacts and environmental trends.

The following NWT CIMP-funded projects focus on traditional and local knowledge, water, caribou or fish. Some projects (indicated with \*) incorporate more than one theme. Final reports for completed projects will be available online at the [NWT Discovery Portal](#).



## 2.2.2 Research and Monitoring to Improve Knowledge

**RELATED ACTION ITEMS:** 2.5A, 2.5B, 2.5C, 2.5D, 2.5E, 2.6A, 2.6B, 2.6C, 2.6E, 2.6F, 2.7A, 2.7B, 2.7C, 2.7D, 2.8A, 2.8B, 2.8C, 2.8D, 2.8E, 2.9A, 2.9B, 2.9C, 2.9E, 2.9F, 2.9G, 2.9H, 2.10A, 2.10B, 2.10C, 2.10D, 2.11A, 2.12A, 2.13A, 2.14A, 2.14B, 2.14C, 2.14D, 2.14E, 2.14F

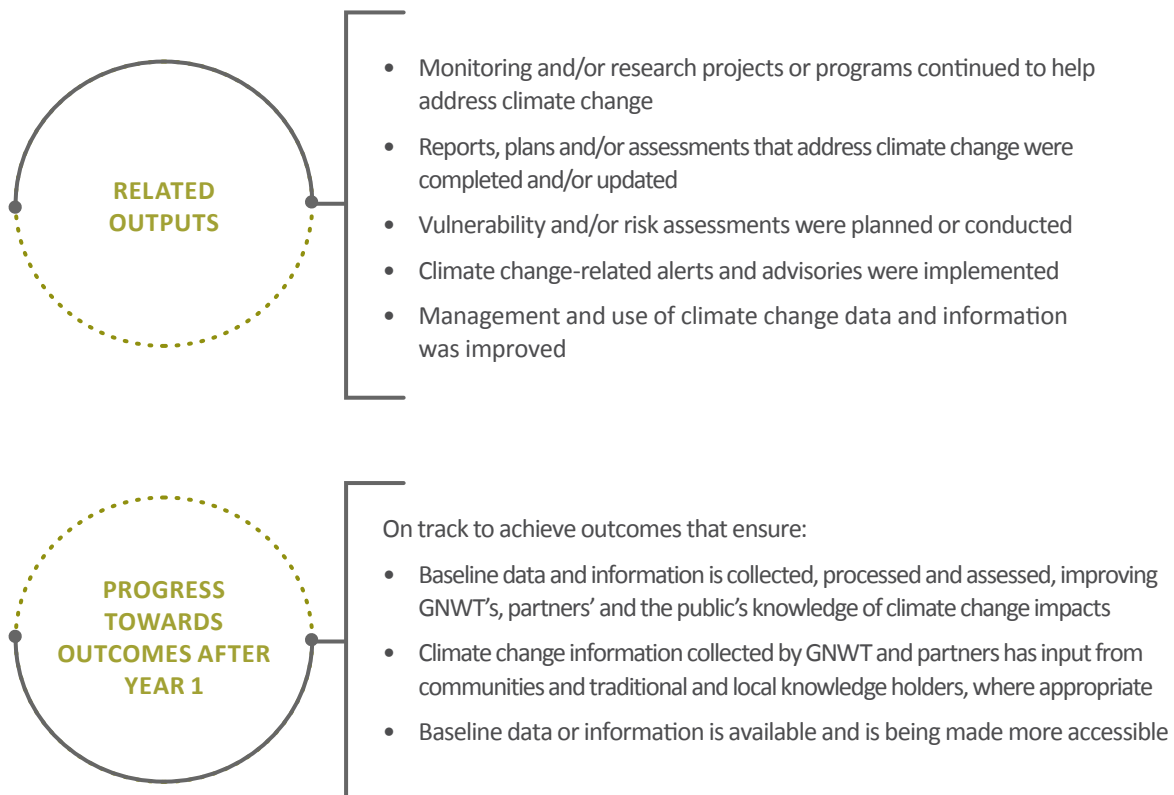
The GNWT and its partners have started several research and monitoring initiatives and programs addressing climate

change knowledge gaps. These gaps are focused on the natural environment, human health and well-being, public safety,

infrastructure and culture and heritage and are described in this section.

### OUTCOMES SUMMARY

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*ENR staff monitoring at a weather station on the Dempster Highway*

### Climate and weather

Improved climate and weather information in the NWT is critical to inform adaptation planning. Progress was made on several actions to better our understanding of climate and weather data. In December 2019, the GNWT signed a memorandum of understanding with ECCC to share weather and climate information and formalize the establishment of the Canadian Council for Weather and Climate Monitoring. The sharing of real time data allows for better weather forecasting. ENR actively participated on the Council in 2019/20 and raised a number of priorities with regards to climate monitoring in the NWT. Work will continue in 2020/21 to develop options to enhance climate monitoring in the NWT.

The GNWT, along with the Governments of Yukon and Nunavut, met several times

in 2019/20 with the ECCC Canadian Centre for Climate Services to discuss northern climate service needs and to provide input to guide the development and proposed operation of a future northern climate services hub, to meet the climate data services needs of the three territories.

ECCC developed and released the **Climate Atlas of Canada** and **ClimateData.ca** online resources in late 2019. The Climate Atlas of Canada combines climate science, mapping, storytelling and videos focused on climate change to support community decision-making. ClimateData.ca provides higher-resolution and daily climate data, as well as information on climate projections and indices.

Monitoring led by Natural Resources Canada, in partnership with the communities of Tuktoyaktuk,

Aklavik and Paulatuk, continued in 2019/20. This monitoring will help to better understand rates and dynamics of coastal change specific to these communities and the impacts to critical marine ecosystems, and will inform future coastal adaptation and mitigation measures. For example, the community-based monitoring program in Tuktoyaktuk (the Climate Resilience Project) has provided ongoing observations of change through measurements of active layer thickness, ice breakup and sedimentation. This co-managed project with the Hamlet of Tuktoyaktuk produced several plain language summaries on coastal erosion and flooding that were delivered to the community during an extensive engagement in March 2020.

## Permafrost

Permafrost is the geological manifestation of climate and the 'glue' that holds northern land together. Changes to climate can result in permafrost thaw that can impact infrastructure and the environment. The Northwest Territories Geological Survey (NTGS) conducts research and compiles information to improve the understanding of permafrost conditions across the NWT.

Permafrost data includes ground temperatures, geotechnical information such as ground ice content, and environmental data such as snow, vegetation and surface water conditions. The NTGS is working with collaborators to develop a permafrost database. In 2019/20, progress continued toward the development of the database, and permafrost data collected in the design and construction of the Inuvik to Tuktoyaktuk Highway (ITH) was compiled and published by the NTGS. The database will inform the maintenance of the ITH and other infrastructure and research projects in the region. Permafrost data represents tens of millions of dollars of field drilling, sample analysis and instrumentation costs, that if managed responsibly, provide the foundation for monitoring permafrost, planning development and mitigating climate change impacts. Permafrost thaw is the primary cause of climate-driven landscape change in the north.

In 2019/20, the NTGS initiated a collaborative project to map thaw-sensitive permafrost terrain across the NWT using satellite imagery. Mapping methodologies were developed for four terrain themes: slopes and mass-wasting, hydrological features, organic terrain, and periglacial landforms. Although there are several local-scale products that describe permafrost conditions, there are no empirically-derived maps that show permafrost thaw features that cover the entire territory. This project relies on collaboration with permafrost experts and Northerners from 15 organizations including: Wilfrid Laurier University, Aurora Research Institute, NWT Centre for Geomatics, ENR, Prince of Wales Northern Heritage Centre, Geological Survey of Canada, Yukon Geological Survey, Queen's University, University of Guelph, University of Victoria, University of Auckland, Ehdiitat Renewable Resources Council, Tet'it Renewable Resources Council, and the Inuvialuit Land Administration.

In 2019/20, the NTGS continued research on thaw slumps in the Beaufort-Delta region. Thaw slumps consist of a headwall made predominantly of ice and a muddy slump floor. They occur in areas of ice-rich permafrost and develop on hillslopes and along the shores of lakes, rivers and coasts. Although thaw slumps are common, the size and activity of these features has increased

Updates on much of the permafrost monitoring and research being led by the NTGS have been published on **Open Report**, an online resource available to the public which hosts datasets with minimal interpretation, allowing for geoscience information to be accessible in a timely manner. See below for Open Report numbers.

### **GROUND TEMPERATURE REPORTS:**

2017-008, 2019-017,  
2019-016, 2019-014,  
2017-009, 2018-009,

### **PERMAFROST GEOTECHNICAL REPORTS:**

2019-008, 2019-011,  
2019-010, 2019-009,

### **DATA SYNTHESIS:**

2019-020, 2019-012

over the last few decades due to changes in air temperature and precipitation. The NTGS in collaboration with the Northwest Territories Centre for Geomatics uses drones to survey the slumps to understand how these features change over time. In 2019, in partnership with INF, the NTGS established permafrost monitoring at a site where a thaw slump could lead to a landslide that would threaten the Dempster highway.



ENR staff conducting water sampling from a float plane

### Water and wetlands

ENR continued to maintain long-term monitoring programs across the NWT in 2019-2020 to assess water quality and quantity. Long-term monitoring is critical to informing climate change knowledge, assessments, policies and related decisions. For example, snow survey monitoring contributes to a better understanding of changes in winter precipitation and informs the **spring water levels outlook**.

ENR also worked with Indigenous and community water partners to support aquatic community-based monitoring and research programs as well as transboundary aquatic monitoring programs. Community-based monitoring fosters a wide range of innovation, including increased

awareness of water stewardship issues, improved traditional knowledge collection and application, as well as increased direct community involvement in research and monitoring program design. Water quality results from the community-based aquatic monitoring can be found at [www.mackenziedatastream.ca](http://www.mackenziedatastream.ca).

Engagement for water-related programs and initiatives with water partners occurred throughout the year, including Water Strategy Aboriginal Steering Committee meetings and the Water Stewardship Strategy annual meeting hosted by ENR with the theme “Northern Waters in a Changing Climate” in October 2019.

One example of monitoring and research is a project being conducted by ECCC to assess the present-day and future stability

### CARBON FLUX

The amount of carbon exchanged between Earth’s carbon pools – the oceans, atmosphere, land and living things

of legacy arsenic contamination stored in Yellowknife Bay sediments that originated from local gold mining activities. This project will generate new information on how long-term climate change may impact the recovery and stability of legacy arsenic contamination in sediments and the overlying waters of Yellowknife Bay.

Several external partners have a keen interest in water and climate change-focused work. Through partnerships with the GNWT and IGOs, Ducks Unlimited Canada has been leading NWT wetland mapping classifications of three protected areas, Dinàgà Wek’èhodì, Ts’udé Niljné Tuyeta and Thaidene Nënë, recognizing that wetlands play a key role in adapting to a changing climate.



## Forests and vegetation

ENR began work on the first phase of a two-phase project to conduct vulnerability assessments for forest landscape areas of interest in 2019/20. A draft report was developed with the Canadian Forest Service focusing on the following themes: climate, forest inventory and productivity, permafrost thaw, wildfire, insects and pathogens, drought, flooding, carbon balance, and caribou habitat. It will serve as a reference resource for any future projections of forest conditions.

A workshop was held on March 4-5, 2020, in Yellowknife to initiate the second phase. GNWT, Canadian Forest Service and ECCC staff identified key climate change vulnerabilities to NWT forests and developed options for incorporating adaptation into forest management, wildlife management, and land use planning. Results of the workshop and the NWT Forest Baseline Report will be available in 2020/21 and will inform next steps, including engagement with IGOs.

ENR also made progress on baseline NWT-wide vegetation classifications, which included the re-measurement of a multi-source vegetation inventory (combining various sets of data to produce a digitally mapped inventory); permanent sample plots; initiating mapping of permanent sample plots in the Hay River area; and acquisition of satellite imagery for analysis. Work will continue over three years to



*ENR staff using a Go-Pro camera to document a forest measurement plot*

update a vegetation classification in the Taiga Plains, which will provide important baseline information for tracking forest health and change including changes in carbon flux.

Monitoring of changes to forest growth, productivity, health and regeneration after natural and human-caused wildfires was undertaken in the summer of 2019 to better understand forest regeneration following wildfires, in the context of a changing

climate. A post-fire regeneration report for multiple sites is planned for 2020/21. In addition, work continued on a multi-year field program to assess the frequency, location and size of wildfire occurrence over the last 200 years, and to document changes over time to improve understanding of changing wildfire regimes. **The NWT Forest Health Report and Newsletters** are published on the ENR website and provide annual overviews of NWT forest health.

The Deninu Kųé First Nation is conducting a project funded through NWT CIMP to sample forage lichens at wildfire sites to learn how long it takes for forage habitat to become suitable for boreal caribou. The results of this project will help determine when disturbed areas become functional habitat for boreal caribou, which is essential to range planning and forecasting future habitat for boreal caribou under climate change (see 2.3.2 for more information on range planning).

CARILAUSEN



*The Northern Myotis (pictured above) is listed as a species of Special Concern on the NWT list of Species at Risk and as Endangered on the federal Species at Risk list*

## Wildlife

ENR initiated work on wildlife climate change vulnerability assessments for species at risk and a final report of assessment results will be available in 2020/21. Following completion of these assessments, a second phase will be initiated to add additional species, including other keystone species, harvested species, and species of cultural and spiritual significance.

The NWT Species General Status Ranking Program enhances the knowledge of species presence, distribution and status through updates of species information and rankings, every five years. This rapid status ranking system results in official species lists that form the baseline for measuring movements and change in the biological status of species due to climate change. The NWT Species 2016-2020 report is available on the ENR website and work has been initiated on the next report (NWT Species 2021-2025). The program also sets priorities for detailed assessment by the

NWT Species at Risk Committee of the conservation status of species, including the assessment of levels of threats such as a changing climate. The public was invited to provide input on recovery and management options for two species at risk in the summer of 2019; specifically barren-ground caribou and bats.

Knowledge-sharing through the dissemination of current and new information on the health and distribution of wildlife, including diseases and parasites, is critical for increasing territory-wide understanding. Visible diseases or pathogens are tracked using hunter interviews and self-reporting using sample kits, regular wildlife health surveillance via regional ENR offices and through collaboration with academia and other partners. Results are reported at regional wildlife workshops, renewable resources board meetings and/or community meetings, as well as through publications by partners.

A working group to advance the development of the NWT Council on Pests, Pathogens and Invasive Species was established with representatives from ENR, ITI, and the Wek'èezhì Renewable Resources Board. This working group met twice in 2019. In future years, the NWT Council on Pests, Pathogens and Invasive Species will be able to support rapid response programs and educational materials on future pests, pathogens and invasive species issues due to the changing climate.

The NWT Invasive Alien Species Project continues to gather species information on new and potentially invasive species. The species information is continually verified and entered into the **Wildlife Management Information System**. This is an online database that stores observation data on the location and number of wildlife species and their habitats in the NWT and is available for government staff, industry, researchers, and the general public upon request.



*A man removes a fish from a net during a monitoring program*

### Fish and marine mammals

In 2019/20, monitoring continued for key fish and marine mammal species, with a focus on improved baseline monitoring of health and distribution. Fisheries and Oceans Canada (DFO) led several projects which monitor fish and marine mammals that are consumed by humans. Monitoring programs were also undertaken by ECCC, IGOs, ENR, academic institutions and resource management boards. Partnerships with Indigenous communities are essential to scientific and traditional knowledge being integrated into monitoring and reporting.

DFO contributes to improved collection of baseline conditions and ecosystem monitoring through a series of community-based monitoring programs throughout the NWT. In 2019, DFO reported results of a community-based annual monitoring program of mercury, viruses and other diseases in beluga at three locations, including Hendrickson Island (Beaufort Sea). It also released results of biannual monitoring of persistent organic pollutants as part of a program conducted collaboratively with Inuit, the Fisheries Joint Management Committee and the

### MONITORING INVASIVE AND NON-INDIGENOUS SPECIES IN A CHANGING CLIMATE

Monitoring the presence and distribution of invasive and non-indigenous species is imperative to determine changes in range for various wildlife, plant and insect species. NWT residents can contribute to these monitoring programs by reporting new or unusual sightings and information to ENR regional offices or by posting their observations online (e.g. NWT Species Facebook group or iNaturalist). ENR and its wildlife co-management partners also track information on ticks, parasites, and new and emerging wildlife pests and pathogens.

Northern Contaminants Program. Results were published through the Northern Contaminants Program and the Arctic Monitoring and Assessment Program.

The federal Northern Contaminants Program supports several monitoring and research programs which increase understanding of contaminants in fish and marine mammal species that are consumed by humans.



*A member of K'atl'odeeche First Nation holding Inconnu (coney) fish. Fish are an important food source for Northerners*

Projects are typically collaborations involving DFO, ECCC, IGOs, academic institutions, and/or resource management boards. In 2019/20, NWT projects included: monitoring heavy metals and persistent organic pollutants in beluga and ringed seal in the Inuvialuit Settlement Region; monitoring fish for mercury through the community-based Tłıchǫ Aquatic Ecosystem Monitoring Program; and monitoring other metals and persistent organic pollutants in lake trout and burbot in Great Slave Lake, led by ECCC in partnership with IGOs. Additionally, the Fort Good Hope Renewable Resources Council and ECCC led investigations on contaminant concentrations in burbot from the Mackenzie River, and mercury concentrations were monitored in partnership with the Dehcho First Nations across six

lakes in the Dehcho. The Northern Contaminants Program funds several monitoring and research programs to collect information on the influence of climate change on contaminant pathways, processes and effects.

Simon Fraser University is working with the community of Fort McPherson with funding from NWT CIMP to implement a community-based monitoring program to advance knowledge of the ecology and life history of Mackenzie Delta whitefish. Project results will be used by the Gwich'in Renewable Resources Board, the Fisheries Joint Management Committee and local renewable resources councils for harvest decision-making in the context of landscape and climate change happening in the region.

A collaborative project continues between the GNWT and the Government of Canada to carry out a Human Health Risk Assessment on legacy contamination in the areas around Yellowknife, Ndilo and Detah (a 25km radius around Yellowknife).

The study looks at potential exposure risks to environmental contaminants for people who hunt, fish and do recreational activities on and near the inland lakes in the area, as well as for local Indigenous people who carry out activities in traditionally-used areas. Work completed includes collecting information on how people use the study area, a gap analysis of data for arsenic in soils, water, sediment, fish and other country food in the study area, and additional sampling of fish tissue data through samples collected by ENR and through submissions from local community residents. Public engagement activities are anticipated for late 2020.

## HEAT WARNING INFORMATION IN THE NORTHWEST TERRITORIES

### When is a Heat Warning Issued?

A warming planet means exposure to heat is becoming more of a challenge – even in the NWT. A heat warning is issued 18 to 24 hours in advance for a community in the NWT. This is issued to protect the public's health when two or more consecutive days of daytime maximum temperatures are expected to reach 29° Celsius or warmer, and night time minimum temperatures are expected to be 14° Celsius or warmer.

### Who Does Extreme Heat Affect?

Extreme heat is a health risk that affects everyone. Risks are greater for young children, pregnant women, older adults, people with chronic illnesses, those on certain medications and anyone spending large amounts of time outdoors. Extreme heat affects the body's ability to regulate its core temperature, which can result in heat-related illnesses.

Some heat illnesses, such as heat strokes, can be life-threatening. The symptoms of heat illness include: dizziness/fainting, nausea/vomiting, headaches, rapid breathing and heartbeat, extreme thirst, and decreased urination with unusually dark urine.

### Where Can People Find More Information?

To find more information on extreme heat: <https://www.canada.ca/en/health-canada/services/sun-safety/extreme-heat-heat-waves.html>

To find weather conditions and forecasts for your community: [https://weather.gc.ca/forecast/canada/index\\_e.html?id=NT](https://weather.gc.ca/forecast/canada/index_e.html?id=NT)

ANGELA GZOWSKI



*Climate change is resulting in warmer days and more extreme heat in the NWT, which can create health risks for our residents and more wildfires*

## Human health and well-being

The health of NWT residents is linked to the health of the water, wildlife, vegetation and air quality. Climate change impacts can affect human health and well-being. That is why it is crucial that the GNWT provide timely public information related to extreme weather, natural disasters impacting health, zoonotic diseases (infectious diseases that are transmitted from animals to humans) and poor outdoor air quality. The frequency of these events is expected to increase due to climate change.

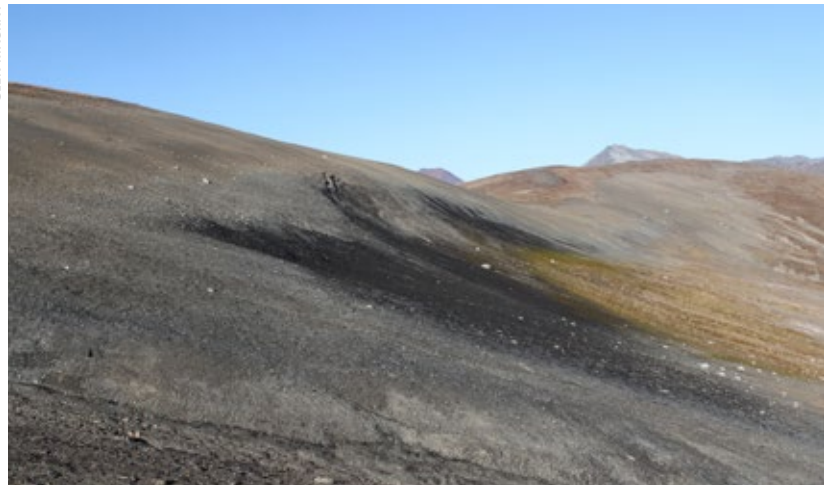
In July 2019, the Department of Health and Social Services (HSS) released its first ever public health advisory for extreme heat exposure, which affected seven communities (Kakisa, Enterprise, Fort Smith, Hay River, Jean-Marie River, Fort Simpson and Fort Providence) and lasted for 13 days. Two public health advisories for wildfire smoke exposure affecting ten communities were also released in 2019. Work will continue to inform the development of procedures to guide the release of future alerts and advisories.

## Public safety

The GNWT is working to ensure residents, first responders, communities and the territorial government are better prepared to deal with the impacts of climate-related hazards. The Department of Municipal and Community Affairs (MACA) is the lead GNWT department on public safety, and works closely



TOM ANDREWS



GLEN MACKAY

*The same ice patch archaeological site pictured in 2007 and 2019. The black material in the 2019 photo is caribou dung that has melted out of the ice, where well-preserved ancient hunting weapons were found. This ice patch is approximately 5,000 years old.*

with community governments to support planning and activities to ensure the safety of residents. In May 2019, an NWT Emergency Management Organization Public Awareness Campaign on Emergency Preparedness was launched. This involved newspaper and radio ads on flood preparedness and emergency preparedness activities, as well

as distribution of emergency preparedness information brochures.

## Culture and heritage

The numerous climate-related changes occurring on the landscape are a threat to important heritage resources, artifacts, and cultural practices in the NWT. The Department of Education, Culture

and Employment (ECE) conducts ongoing research to assess impacts to heritage resources from climate-driven landscape disturbances such as coastal erosion, thawing permafrost, melting alpine ice patches and wildfires. Traditional knowledge informs all field-based studies and is used extensively to identify areas of cultural significance that may be at risk of landscape disturbances due to climate change.

In 2019/20, ECE received external funding for research focused on mitigating the impacts of climate-driven change on alpine ice patches which preserve cultural artifacts, and on archeologically and ecologically significant wood caribou fences traditionally used when hunting caribou. Final reporting will be available in 2020-2021.

### Public and community infrastructure

GNWT infrastructure, such as buildings, public housing, airports, roads and bridges, is impacted by changes to the environment resulting from climate change. Monitoring of impacts on public infrastructure is led by INF. Monitoring of impacts on community infrastructure is led predominantly by community governments, with support from MACA, in partnership with Indigenous and federal governments, industry and academic institutions. The work underway to fill knowledge gaps on climate change impacts to infrastructure will allow for the development of standards, tools and new approaches to support climate change adaptation in the NWT.

PAT KAME



Highway 4, known as the Ingraham Trail, east of Yellowknife.

As a result of the Office of the Auditor General's 2017 report on climate change in the NWT, INF implemented a 10-point action plan to address the OAG's recommendations, including updating and enhancing review and inspection processes as part of the department's asset and life cycle management practices for public buildings and roads.

In 2019/20 the following actions were undertaken:

- Improvements to monitoring and documentation of GNWT infrastructure stability.
- A bridge management system and highway surface management system was put into place to inspect, monitor

and identify the condition of the infrastructure to plan for repairs, maintenance, rehabilitation or replacement.

- Maintenance of airports through the Airport Pavement Management System. Recommendations from inspections are prioritized based on various factors such as safety and severity of distress.
- Several airport drainage studies were conducted that examine additional actions that can build resiliency into airport infrastructure in a changing climate.



*Conducting fieldwork in Dinàgà Wek'èhodi*

- Monitoring snow loads and foundation systems for GNWT (public) buildings, and regularly tracking and analyzing data.
- Monitoring ground temperature at recently constructed buildings in thaw susceptible permafrost soils.
- In partnership with the NTGS, INF collected ground temperature data along the Inuvik-Tuktoyaktuk Highway and sections of Highway 3 to inform planning and required actions to address the impacts of permafrost thaw. Federal funding supports this monitoring.

INF continues to explore the potential for remote sensing and other technology to allow for monitoring and analysis of settlement and movement

of infrastructure. However, application of remote sensing and other technology for this purpose is relatively new. Work in 2019/20 focused on data gathering and initial analysis.

In 2019/20, MACA initiated an assessment of climate change impacts on public and community infrastructure in NWT communities, including a desktop infrastructure climate change risk assessment. The associated report will be finalized in 2020/21 and recommendations will be shared with communities. The results of the climate change risk assessment will support communities in making informed decisions about existing and future infrastructure, as well as inform the need for community specific risk assessments.

NWT community governments face a number of challenges as they deliver basic services to their residents, including funding to fill community infrastructure gaps. The Mandate commits to increasing funding to community governments by \$5 million. Funds were allocated in 2019-2020 and will continue over the next three years. This funding, together with new federal infrastructure funding programs for community governments, is allocated in ways that recognizes community infrastructure gaps. In addition, funding for community governments from the Investing in Canada Program is targeted at improving community roads and solid waste sites, which are likely to be at risk from a changing climate.



## 2.3 Goal 3: Build Resilience and Adapt to a Changing Climate

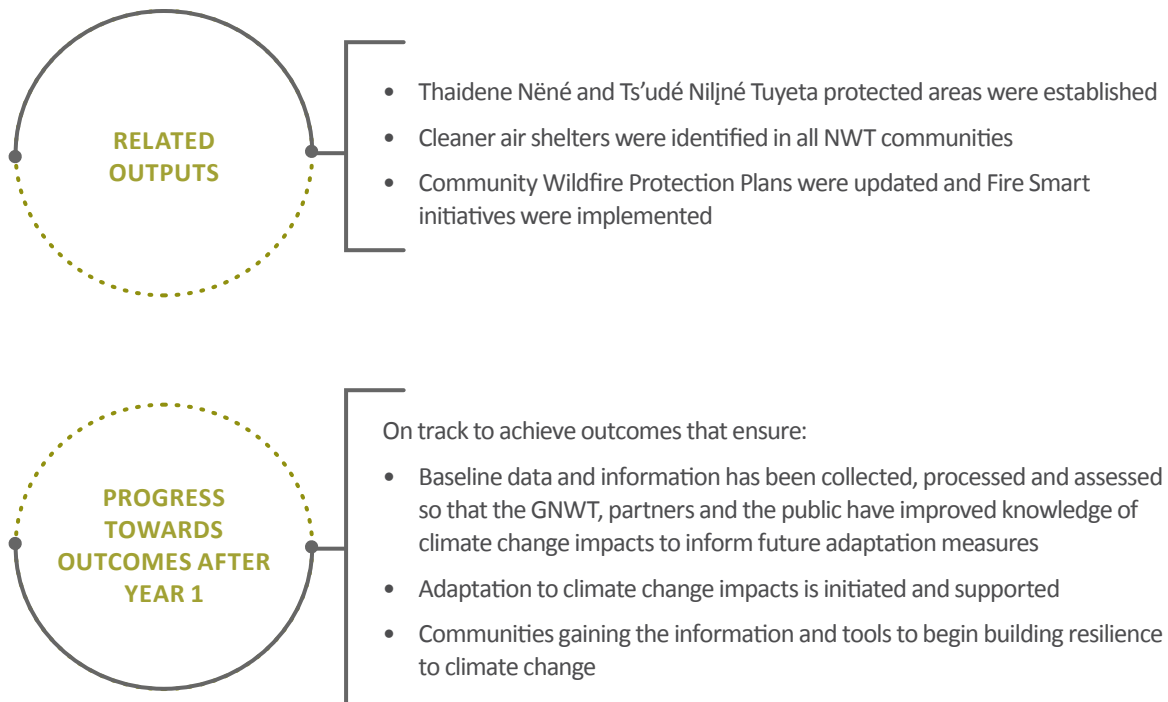
Actions to achieve Goal 3 will build on the work initiated and completed under Goal 2. To build resilience and adapt to the NWT's changing climate, we must improve our knowledge of climate change impacts through research and monitoring; this includes impacts that are already occurring, as well as those yet to come. As action items are completed under Goal 2, more progress can be made on action items under Goal 3.

In Year 1 of implementing the Action Plan, the GNWT has been working towards better accounting of climate change-related impacts and opportunities in existing processes and plans that govern and support the management of ecosystems and natural resources. Important knowledge gaps are being closed through work to make baseline data and information more widely accessible both to partners and

to the public. The GNWT will continue to monitor and collect data to fill knowledge gaps. Additionally, development of adaptation plans is underway to ensure that residents, communities, and infrastructure are resilient to the risks posed by climate change impacts.

### OUTCOMES SUMMARY

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## 2.3.1 Supporting Ecosystem Viability

### RELATED ACTION ITEMS: 3.2A, 3.3A, 3.3B, 3.3C

Ensuring that ecosystems remain healthy and diverse is a priority for the NWT, as food security and traditional economies rely on the maintenance of biodiversity.

#### Completing and reviewing regional land use plans

The Department of Lands is mandated to lead the GNWT's involvement in regional land use planning. Land use planning guides decision making about what activities should take place on public land in the NWT. Land use planning is an important tool for balancing investment and development opportunities with responsible environmental management, conservation and community aspirations. Land use plans can respond to climate change through zoning and by providing guidance and direction to land users and regulators on uses of land.

The Sahtu and Gwich'in land use planning boards are responsible for development, review and amendments, and monitoring and evaluation of land use plans within their respective planning boundaries. The Sahtu Land Use Planning Board (SLUPB)



*A Fort Good Hope guardian in the Ts'udé Niliné Tuyeta protected area, taking part in the biodiversity monitoring program, which is co-lead by the GNWT*

initiated the five-year Review of the Sahtu Land Use Plan in 2018 and held meetings with the general public and planning partners in 2018 and 2019 to discuss potential changes to the Plan. The Department of Lands participated in these sessions. In December 2019, the SLUPB released the draft 5-Year Review Amendment Application of the Sahtu Land Use Plan for public comment. The Department of Lands submitted comments to

SLUPB on behalf of the GNWT on the draft Amendment package in February 2020.

The Gwich'in Land Use Planning Board (GLUPB) is working to complete a review and amendment to the Gwich'in Land Use Plan that was initiated prior to 2019/20. Through its participation in these planning processes, GNWT identifies climate change considerations, as appropriate.

Multi-party work (GNWT, Government of Canada, Indigenous governments and organizations) is underway to develop a process for regional land use planning in Wek'èezhìi and the southeast NWT, and to complete the draft Interim Dehcho Land Use Plan. One of the GNWT's interests is that climate change considerations are appropriately reflected in these land use plans.

### Implementing the conservation network

Implementing an NWT conservation network is one way to support the maintenance of NWT's cultures, land and water for future generations. Protected areas play a key role in supporting ecosystem viability to adapt to climate change. Significant progress was made in 2019/20 on the development of the NWT conservation network, including the enactment of the *Protected Areas Act* in June 2019. The Act includes specific mention of climate change considerations, specifying that "climate change considerations must be factored into protected areas planning and management." Most importantly, the *Protected Areas Act* created a mechanism to permanently protect land in the NWT in collaboration with IGOs.

Significant progress was made on Ts'udé Niljné Tuyeta Territorial Protected Area, which lies west of the Mackenzie River and the community of Fort Good Hope. In this area the GNWT and its partners, the K'asho Got'ìne, will

strive to protect the biodiversity of the Taiga Plains and Taiga Cordillera, while contributing to the cultural continuity of an area that is a sacred place and harvesting area of the K'asho Got'ìne. The GNWT and the K'asho Got'ìne signed an establishment agreement for Ts'udé Niljné Tuyeta Territorial Protected Area in September 2019. The area is being managed by the Ts'udé Niljné Tuyeta Management Board, which held its first meeting in the fall of 2019.

The GNWT, in collaboration with several IGOs, including the Thìchq Government, North Slave Métis Alliance, Yellowknives Dene First Nation, and Northwest Territory Métis Nation, have continued to make progress toward the establishment of Dinàgà Wek'èhodì Territorial Protected Area in the North Arm of Great Slave Lake. It is anticipated that this area will be formally established in 2020/21.

Thaidene Nënë includes a National Park Reserve and a Territorial Protected Area. The Territorial Protected Area is the first created under the *Protected Areas Act*. The entirety of Thaidene Nënë is designated by Łutselk'e Dene First Nation as an Indigenous Protected Area (see sidebar).

### THAIDENE NĒNÉ NATIONAL PARK RESERVE AND TERRITORIAL PROTECTED AREA

Established in August 2019, Thaidene Nënë Territorial Protected Area was the first area to be formally designated through regulations under the *Protected Areas Act*. Alongside the Territorial Protected Area, there is a territorially designated Wildlife Conservation Area and a National Park Reserve established by Parks Canada. Together, the three areas create a 33,690 km<sup>2</sup> Indigenous Protected Area situated at the eastern end of Great Slave Lake, which encompasses a number of key ecological features, cultural sites and critical habitat for diverse wildlife.

As an area with deep ties to many communities in the NWT, Thaidene Nënë is being collaboratively managed by the GNWT, Parks Canada Agency, Łutsël K'e Dene First Nation, Northwest Territory Métis Nation, Yellowknives Dene First Nation and Deninu K'ue First Nation. The Management Plan for the protected area must include climate change considerations, as stated in the *Protected Areas Act*.

## 2.3.2 Managing the Natural Environment and Demands on It



*Caribou on the Tibbitt to Contwoyto Ice Road*

### RELATED ACTION ITEMS: 3.5A, 3.5B, 3.6A

As research and monitoring continues, important knowledge gaps will be filled to better understand the NWT's natural environment. Results along the way will be integrated into climate change planning and adaptation.

#### Implementing wildlife plans and strategies

Caribou hold cultural and spiritual significance for Indigenous peoples in the NWT and are respected as an important part of northern biodiversity. Ensuring appropriate management and conservation of caribou in a changing climate is critical.

In August 2019, ENR released and began implementing the **Bathurst Caribou Range Plan**. This plan is a living document that guides and supports land use, regulatory and wildlife decision-making in support of recovery of the Bathurst barren-ground caribou herd. The plan is based on knowledge sources and perspectives grounded in both traditional knowledge and contemporary western science. This plan considers key habitats where climate change impacts are expected to be pronounced. ENR held three workshops with several IGOs to document important water crossings and winter range habitat for Bathurst Caribou. A visioning workshop for the Caribou Guardians Coalition was held in early 2020 and three years of funding has been secured from Polar Knowledge Canada

to support ongoing development of the guardians program, which aims to support Indigenous guardians as watchers of caribou and environmental conditions.

Boreal caribou are a distinct population of woodland caribou. In August 2019, ENR finalized **A Framework for Boreal Caribou Range Planning**, which provides a common approach for developing regional range plans for the NWT. Due to the extensive range of boreal caribou and the overlap with several settled and unsettled land claim regions, five range plans will be developed for boreal caribou in the NWT.

#### Capturing carbon in forests

ENR is working to increase forest carbon sequestration through silvicultural practices, including planting in areas that have not returned to forest after natural disturbances and thinning in areas that are overly dense. In 2019, a planting assessment was completed in Cameron Hills in the Dehcho region, and two thinning assessments were completed in Birch Creek (South Slave region) and the Sandy Lake area (North Slave region). Thinning was not recommended for Birch Creek. However, planting and thinning programs will be implemented in Cameron Hills and the Sandy Lake area in 2021.



*Climate change is impacting traditional ways of life in the NWT such as the availability and harvesting of country foods*

## 2.3.3 Protecting and Supporting People

**RELATED ACTION ITEMS: 3.7A, 3.7B, 3.8A, 3.8B, 3.8C, 3.9A, 3.10A, 3.11A, 3.11B, 3.12A, 3.13A, 3.13B, 3.13C**

Protection of people and culture is of paramount importance. This responsibility is shared by community, Indigenous, territorial and federal governments and NWT residents. As the climate changes, various levels of government must be able

to anticipate, address and minimize emerging risks and associated impacts to human health, public safety, and culture and heritage. Climate change is resulting in increased unpredictability in seasonal weather. This affects decision-making in many aspects of

Northerners' lives, including whether or not it is safe to travel on the land for subsistence harvesting. Building resilience and adapting to climate change impacts will be critically important for NWT residents.

### **Increasing local food security and food production**

Food security through country food harvesting and local food production is necessary to support the health and well-being and resilience of NWT residents and communities. Country foods in particular have cultural, spiritual and nutritional value, and can be impacted by the effects of climate change. Local food production through agricultural practices is also increasingly important and valued by many NWT residents, especially in the context of food security in a changing climate.

The **Sustainable Livelihoods Action Plan 2019-2023** was released by ENR in August 2019 and outlines collaborative actions to support country food research and programs, food security, traditional economy and land-based learning. Climate change is one of the plan's guiding principles. The plan is now in its first year of implementation.

As per the Sustainable Livelihoods Action Plan, ENR has initiated work to support country food-related research, including climate change impacts to community food security in partnership with academic researchers, IGOs, and other collaborators. In 2019/20, an application was approved by the Canadian Institutes of Health Research to undertake a collaborative

four-year research project focused on the intersection of Indigenous health and wellness, climate change and food security.

In addition to country food and climate change research, the Sustainable Livelihoods Action Plan also identifies a number of actions to help support skills development for harvesting and land-based pursuits. This includes development of harvester mentorship programs and support for regional training opportunities, including butchering, processing, safety and navigation.

The implementation of the **NWT Agriculture Strategy** supports the increase of local food production through actions, industry investments and the development of legislative tools. These measures are focused on increasing production of fresh, healthy, safe and more affordable locally-grown food choices, while creating new economic opportunities for NWT residents. In 2019/20, the GNWT assisted the newly formed Territorial Agri-food Association during its 2019 annual general meeting and strategic planning session. ITI also supports access to agricultural training and expertise to meet regional and community-specific needs, and improve regional and local capacity through the Canadian Agriculture Partnership program, which is in place until March 2023.

A GNWT interdepartmental committee has been established to review current statutes, regulations, policies and guidance documents related to agriculture that require updating. The committee will also work to develop specific agriculture policies and regulatory frameworks to encourage the growth of the commercial agricultural sector.

### **Improving capacity and resilience of health and social services and responding to human health risks**

HSS advanced key initiatives in 2019/20 in planning to respond to risks to human health and well-being, and to improve the capacity and resilience of health and social services in the NWT.

Draft reports completed for each community for the Cleaner Air Shelter Identification Project were shared with community governments for review. In addition, evacuation plans for each of the five major health care facilities were completed in 2019. Tabletop exercises, which are discussion-based sessions with emergency response team members to discuss, clarify, and practice the procedure for an emergency, were completed for three of the facilities. As part of emergency evacuation planning, assessments of whether essential services can be provided during extreme weather and climate-related events have been initiated and will continue in 2020/21.



*A young NWT resident helping FireSmart her property with her family for the FireSmart contest held in summer 2020*

A new federally-funded climate change coordinator delivered a presentation to community health representatives on climate change impacts to health and regularly liaised with other departments, including ENR, to advance planning for climate change initiatives focused on human health and well-being.

### **Updating community emergency plans and operations and maintenance procedures**

A community emergency plan prepares communities to deal with emergencies, including climate change risks. The GNWT works with communities to support emergency planning. In 2019-2020, MACA delivered three workshops

to communities to support updates of their community emergency plans. The workshops highlighted methods for identifying and monitoring climate change related hazards. Three community emergency plans were updated in 2019/20. In all, 18 community governments have emergency plans that are less than five years old and reflect updated information about climate change hazards and risks.

In 2019-2020 one community plan was approved, four were submitted to MACA for review, and seven other communities began the process of updating their plans. All of these communities included climate change as an item in the plan development.

All 33 NWT communities have identified facilities suitable for use as cleaner air shelters and extreme heat event cooling centres.

### **Enhancing wildfire disaster mitigation**

ENR works with communities to develop and implement Community Wildfire Protection Plans (CWPP). A CWPP assesses wildfire/urban interface hazards and risks, and makes recommendations to lessen the threat and impact from wildfire. In 2019/20, 29 CWPPs were updated for every NWT community potentially at risk from wildfire. Updated plans will be available on the ENR website in 2020-2021.

FireSmart is implemented through seven principles: education, emergency planning, vegetation management, legislation, development, interagency cooperation, and cross training. In 2019-2020, ENR led a number of activities to support these FireSmart principles. These activities included FireSmart information sessions, participating in workshops to support community adaptation planning in Kakisa, Samba K'e and Fort Smith, assisting with writing and advising communities, such as Fort Providence, on federal funding proposals and presenting information through webinars.

Vegetation management is a strategy to reduce wildfire hazard. In 2019-2020, research and mitigation work was completed in the west channel next to Hay River. Preparatory work was also completed at Enterprise's Community Protection Research site to understand eight community vegetation management treatments. This work will support scientific and operational research, public education and firefighter training.

### Community hazard mapping

In 2019-2020, the GNWT undertook work to support the development of a community hazard mapping program to identify hazards that represent risks to communities from thawing permafrost, flooding, wildfire, erosion and other climate related impacts. An inventory of data was developed and key data gaps identified. Fine-scale surficial geology was identified as a missing base layer that would be of value for multiple disciplines. As a result a pilot project was initiated to test the development of a fine scale surficial geology map for one NWT community.

Led by the NTGS, the Thermokarst Mapping Project started in 2019 and focused on identifying all permafrost features at a coarse scale around the 33 NWT communities. This work will inform priorities for further finer scale investigations to support hazard mapping.

### Safely accessing land, water and ice

Northerners rely on land, water, and ice for recreation, travel, and sustaining cultural practices. A pilot project led by the Canadian Ice Service and the Canadian Centre for Climate Services will prioritize providing community-focused ice information products to support on-ice travel and travel in ice-filled waters. The Canadian Ice Service initiated the development of community ice products for Sachs Harbour, Tuktoyaktuk and Ulukhaktok.

SmartICE is a cross-sector social enterprise working in partnership with academia, industry, government and community to develop a sea-ice monitoring and information sharing system that blends Inuit traditional knowledge with state-of-the-art technology. SmartICE is working together with IGOs and community governments to implement the SmartICE monitoring and information service in select NWT communities to facilitate safe passage over ice. In 2019/20, in partnership with Tuktoyaktuk Community Corporation and Inuvialuit Regional Corporation, SmartICE equipment was deployed, community operators received training, and SmartICE monitoring was initiated in Tuktoyaktuk and Paulatuk. SmartICE also participated in a community engagement meeting in Paulatuk. Funding has been secured for introduction of SmartICE to two other Inuvialuit

Settlement Region communities between 2020-2022.

The ability to incorporate extreme weather warnings into a public alert system will be an important way to keep northern communities safe. A website, [www.NWTAlert.ca](http://www.NWTAlert.ca), has been developed as a single source for alerts and other public safety messaging. Public access to alerts after broadcast, other public safety notifications, a library of past alerts, and a map to display an impacted geographical area, will be available on the site. NWT Alert is expected to be launched in 2020-2021.





*The Kò Gocho Centre in Behchokò*

## 2.3.4 Designing, Building and Maintaining Resilient Infrastructure

### RELATED ACTION ITEMS: 3.14A, 3.15A, 3.15B, 3.15C

Strengthened monitoring and assessment of existing public infrastructure such as buildings, highways and airports (see Goal 2, Public and Community Infrastructure), will inform the development of standards, tools and measures to adapt infrastructure in the NWT so that it is resilient to current and future climate conditions and climate change-related risks.

The GNWT and NWT Association of Communities (NWTAC) actively participate in the development of northern-focused standards to better adapt to a changing climate through the Northern Infrastructure Standardization Initiative (see page 58).

In 2019/20, three new national standards were released:

- CSA PLUS 4011.1:19 – Technical Guide: Design and construction considerations for foundations in permafrost regions

- CSA W205:19 – Erosion and sedimentation management for northern community infrastructure
- CSA S504:19 – Fire resilient planning for northern communities

Work is progressing to ensure recent climate change considerations are being accounted for in new and revised standards for infrastructure planning and construction.

## NORTHERN INFRASTRUCTURE STANDARDS

The Northern Infrastructure Standards (NISI), established by the Standards Council of Canada, supports the development of infrastructure standards that are specific to infrastructure in the North and consider the impacts of climate change such as permafrost thaw, coastal erosion, and changing temperature and precipitation patterns. Standards have been developed to support community infrastructure and to mitigate extreme weather challenges. The standards can be found at [www.scc.ca/en/nisi](http://www.scc.ca/en/nisi)

In 2019 four standards focusing on improving community drainage, managing changing snow loads, preventing permafrost degradation, and understanding thermosyphon foundation systems were summarized in plain language. Further information can be found at [www.ecologynorth.ca/project/northern-adaptation/](http://www.ecologynorth.ca/project/northern-adaptation/).

DEPARTMENT OF INFRASTRUCTURE



*Ditch excavation for the Tłı̨chų Highway*

The NWT's transportation system is also being impacted by climate-related changes, particularly thawing permafrost and variable ice conditions, and these impacts are being felt more intensely in northern regions. The GNWT has continued to work on replacing winter roads with all-season roads and adapt its infrastructure to respond to shorter and increasingly unpredictable winter road seasons resulting from a changing climate.

In 2019-2020, progress was made on the following all-season road projects:

- Following an environmental assessment and regulatory permitting, construction began on the Tłı̨chų Highway in September 2019. The 97 km road will provide year-round

access to Whatì, as well as increase the winter road operational season to Gamètì and Wekweètì. It is on track to be open to the public in November 2021.

- The Great Bear River Bridge and its subsequent road alignment tie-ins to the existing Mackenzie Valley Winter Road are in the design and engineering phase. Several community engagement sessions took place between April and November 2019, and geotechnical investigations were completed 2019 and early 2020.
- Engagement on the Mount Gaudet and Prohibition Creek All-Season Roads took place throughout 2019/20 and geotechnical drilling was completed in early 2020 for certain segments of the roads.

# 2.4 Cross-cutting Themes

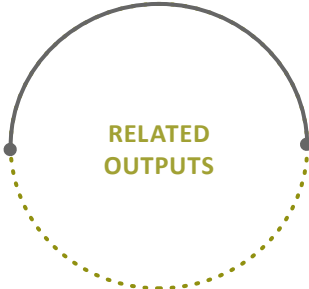
Responding to the complexity and breadth of climate change requires an integrated and collaborative approach. Progress has been made on a number of actions focused on the Action Plan’s cross-cutting themes of leadership, communication and capacity-

building, as well as economic impacts and opportunities.

Through implementation of various climate change actions, many relationships have been strengthened and new relationships built between the GNWT, IGOs, community

governments, NGOs, federal departments, pan-territorial partners, academia and others. These relationships are integral to the territory’s progress and advancement in responding to and addressing the challenges and opportunities resulting from climate change.

## OUTCOMES SUMMARY



- Climate change related communication, outreach and educational programs were developed and shared
- Training programs related to climate change were developed or provided to IGOs and community governments
- Support was provided to IGOs and communities to access climate change funding



- On track to achieve outcomes that ensure:
- Co-ordination and accountability by the GNWT for mitigating and/or adapting to the potential impacts of climate change is improved
  - IGOs and community governments have support to build resilience and adapt to potential climate change impacts
  - Climate change information is available and is being made more accessible

## 2.4.1 Leadership

### RELATED ACTION ITEMS: 4.1A, 4.1B, 4.1D, 4.2A, 4.3A

The Mandate highlights the GNWT's commitment to climate change issues, and includes the priority to strengthen the government's leadership and authority on climate change.

The GNWT Director-level Climate Change Working Group, and corresponding Assistant Deputy Minister, Deputy Minister and Ministerial Energy and Climate Change committees, have played important leadership and coordinating roles across departments in seeking funding, establishing and strengthening partnerships, and sharing knowledge to support the implementation of the Action Plan.

Importantly, at the time of drafting this report, the GNWT secured additional internal funding, intended to increase capacity to implement CCSF and

Mandate commitments. This major funding commitment will be reported on in more detail in the next annual report.

As the lead GNWT department for climate change, ENR has collaborated within the GNWT and with external partners to provide overall leadership, coordination and guidance on climate change. This includes:

- Coordinating Pan-Canadian Framework 2019/20 reporting with GNWT departments
- Participating on Canadian Council of Ministers of the Environment Climate Change Committees to ensure NWT perspectives and needs inform the development of national guidance, such as the Good Practices in Climate Change Risk Assessments (to be released in 2020/21)
- Participating on the Pan-Territorial Adaptation Committee to support knowledge exchange and capacity building between the three territories

ENR has also started work to support the establishment of an NWT Climate Change Council (Council). The Mandate commits the GNWT to improving coordination and communication for climate change through the establishment of a Council. Due to the unexpected challenge of COVID-19, work on its establishment was delayed; however, the Council is anticipated to be established in 2020/21. During a preliminary meeting to discuss the Council, IGO representatives expressed support for the establishment of a Council. There was also broad support for seeking and incorporating input from Elders, youth and other interest groups.

## 2.4.2 Communication

### RELATED ACTION ITEMS: 4.4A

Climate change is a complex, cross-cutting issue that requires clear information about current and future challenges, and options available to address these challenges. Communicating with and reaching out to partners and the public to share and exchange knowledge and ideas is vital to understanding issues, identifying options available, and taking action to address climate change.

ENR is responsible for leading the development and delivery of a climate change outreach plan through a collaborative and coordinated effort with various GNWT departments and partners. In 2019-2020, a draft outreach plan was developed and several outreach activities were implemented. Examples of outreach activities that were completed include:

- Participated in the NWTAC Annual General Meeting in February 2020 to provide climate change information during a themed session and at tradeshow booths, and partnered to recognize communities for their leadership in adapting to climate change and energy efficiency
- Visited communities to meet with IGOs and community governments to better understand their climate change issues and needs, as well as discuss progress on current projects and potential funding opportunities and support for future projects
- Participated in community workshops



ENR, INF and the NWT Association of Communities partnered to fund two new awards to recognize communities that are taking leadership in climate change. Inuvik received the Energy Excellence Award and Ulukhaktok received the Climate Resiliency Award in 2020.



Hide tanning in Łutselk'e

## 2.4.3 Capacity-building

### RELATED ACTION ITEMS: 4.5A, 4.6A, 4.6B, 4.6C, 4.7A, 4.7B

Enhancing capacity of decision makers in our communities is a key focus area for the GNWT. In 2019/20, the GNWT supported steps to strengthen IGOs and community government capacity on climate change by:

- Reviewing and providing climate change related advice for funding applications and project proposals
- Sharing funding opportunities (see a list of NWT projects funded under **Climate Change Preparedness in the North** and **Indigenous Community-Based Climate Monitoring Program**),
- Connecting researchers with communities
- Presenting information or

research results (e.g. in person, webinars, and through video and teleconference calls)

- Supporting community-based monitoring, and working with partners, such as NWTAC, to respond to community needs

The GNWT assists communities with funding applications. For example, in 2019-2020 the GNWT supported the community of Wekweètì, alongside Wilfrid Laurier University, in writing a successful funding proposal to look at socio-economic impacts of climate change on the winter road. In 2020-2021, this project will expand to look at developing a vulnerability assessment and framework that can be used by other winter road communities.

Another way the GNWT assists communities with funding is through its role as a member of the Climate Change Adaptation Committee. As an advisory member, the GNWT reviews and provides climate change-related advice for project ideas and applications received through the Climate Change Preparedness in the North and Climate Change Health Adaptation programs.

Increasing climate change knowledge for decision-makers and community government staff to use is vital to incorporate climate change into community planning, operations, policy and projects. To support climate change knowledge building for communities, MACA and ENR partnered

to deliver a three day in-person course, Integrating Climate Change Measures into Municipal Planning and Decision Making, through MACA's School of Community Government in Fort Simpson. The course material will be continually revised as new climate change resources become available. The course will be delivered in other regions in the future, and is also available online for self-directed learning.

In addition to the in-person course, the School

of Community Government Webinar Series featured two webinars related to climate change in 2019/20. The webinars are titled Climate Change for Councillors and Climate Change. They are available to watch online at: <https://elearning-sofcg.org/program/webinars>.

The GNWT has worked on a number of projects to help communities strengthen various planning tools to address risks associated with climate change. NWTAC, MACA and ENR partnered

to develop a Climate Change Community Planning Guide to integrate climate change considerations into community plans. A workshop with NWT planning-related professionals was held in January 2020, and information was used to develop a draft guide outline and description of contents. The guide will be completed in 2020/21.

## 2.4.4 Economic impacts and opportunities

### RELATED ACTION ITEM: 5.1A

As the NWT is warming at a rate approximately three times the global rate, the potential for significant impacts to the NWT's infrastructure, economy, and resident's health and well-being is high. In 2019/20, the NWTAC and GNWT collaborated on a

study to begin to assess the economic cost implications of climate change in the territory. The four modules in the draft Estimated Cost Implications of Climate Change in the NWT report include: the impacts of climate change on infrastructure, the impacts of

climate change on quality of life for residents, the impacts of climate change on economic activities, and clarifying climate change adaptation practices. The report and a plain language summary will be finalized in 2020/21.

# 3.0 New Actions Responding to Part 2 – Areas for Future Collaboration

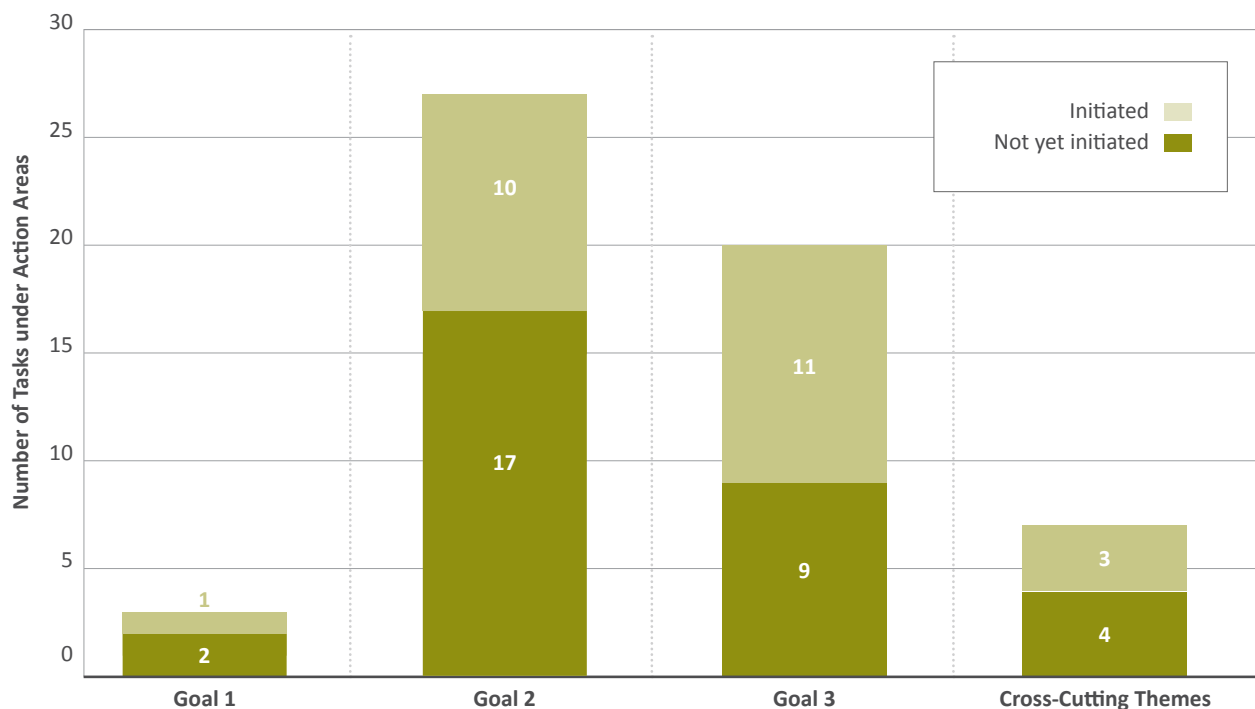
The climate of the NWT will continue to change in the coming decades. This will alter both natural and built environments, and impact human health and well-being, public safety, and culture and heritage.

Part 2 - Areas for Future Collaboration identifies 28 high priority action areas with 57 associated tasks that require additional resourcing to be initiated. Of the 57 tasks,

25 have been initiated in 17 action areas during 2019/20 (see Figure 5). However, many are not fully funded or staffed and require additional resources to achieve their

intended outcomes. The Action Plan is a living document. As the Part 2 tasks are fully resourced, they will be updated and transitioned into action items and tracked.

FIGURE 5. STATUS OF TASKS UNDER PART 2 ACTION AREAS





Seventeen of the initiated Part 2 action areas in 2019/20 were funded through the Climate Change Preparedness in the North funding from the federal government, through Crown-Indigenous

Relationships and Northern Affairs Canada (CIRNAC).

In October 2020, the GNWT announced the creation of 15 new positions to meet present and future commitments

under Part 2 of the Action Plan and achieve the climate change Mandate priorities. As the additional funding was finalized in 2020/21, it will be reported on in the next annual report.

## 3.1 Climate Change Preparedness in the North Funding

The Climate Change Preparedness in the North program (CCPN), funded by CIRNAC, is intended to assist the GNWT in mainstreaming, integrating and considering climate change adaptation in day-to-day operations.

CCPN has a territorial government stream and a community stream. More information on the community stream can be found online at [www.rcaanc-cirnac.gc.ca/en/g/1481305554936/1594738066665](http://www.rcaanc-cirnac.gc.ca/en/g/1481305554936/1594738066665). The territorial stream, managed by ENR, focused on supporting GNWT departments in initiating Part 2 action areas linked to adaptation.

Selected highlights of initiatives funded in 2019/20 are provided in this section, and status updates on Part 2 action areas that have been initiated can be found in Appendix A.

### Permafrost and community hazard mapping

As mentioned under community hazard mapping in section 2.3.2, the NTGS led a Thermokarst Mapping project in 2019. Additional project funding was obtained through CCPN. This funding supported a permafrost mapping technician position through the Wilfrid Laurier University research office in Yellowknife, as well as summer student positions within the GNWT. The funding will continue in 2020-2021, and the project will inform priorities for further investigations to support hazard mapping.

ENR partnered with the NWT Centre for Geomatics to acquire radar imagery for 52 target areas in the NWT. This imagery will be used to track ground movement over time and will inform hazard mapping. Radar imagery of target areas was acquired in 2019/20, and includes all NWT communities and other areas of interest, such as the Inuvik to Tuktoyaktuk Highway, mines, and hydroelectric facilities.



*NTGS staff utilizing a procedure to document and inventory permafrost and thermokarst features from helicopters*

### Community and public infrastructure assessments

INF completed a LiDAR (Light Detection and Ranging) survey of a 2 km-wide corridor of the Dempster Highway from Inuvik to the NWT/Yukon border to improve the monitoring of geohazards along the highway, including thaw slumps. The survey was completed in 2019/20 and the information collected will assist in the prioritization and optimization of operations and maintenance of the highway.

Assessments of foundation capacity of adfreeze piles supporting GNWT and community buildings were also conducted. Adfreeze piles are a type of foundation that derive their strength from the bond of the frozen ground around them to the pile. Foundations were assessed to determine if pile capacity may have decreased since building construction, due to permafrost thaw, by identifying buildings that

are likely to be founded on adfreeze piles. The geotechnical and structural assessment was initiated in 2019/20 and will continue in 2020/21.



*A thaw slump adjacent to the Dempster Highway where permafrost ground temperature monitoring stations have been installed*

### **Public safety**

MACA initiated a process to update the NWT Hazard Identification Risk Assessment to inform emergency management and planning in 2019-2020. The previous assessment, which was originally released in April 2014, provided a ranking of the greatest risks posed to the people, property, environment and economy of the NWT and included consideration of climate change impacts and local knowledge. Planning and preparing for future emergencies requires updates to risk information, such as potential climate change impacts, to ensure the GNWT

emergency response system is prepared to respond potential future changes. Planning will continue in 2020/21.

### **Forests and vegetation**

ENR initiated a two-year project to support field work to build on an aerial photo library of landscape change features to match on-the-ground land cover types with changes noticed in tasseled cap imagery. Tasseled cap imagery analysis detects changes in brightness, greenness and wetness between images.

As discussed under forests and vegetation in section 2.2.2, ENR continued work

on a multi-source vegetation inventory around Fort Liard, Hay River, Fort Providence and Enterprise. The completion of the remaining plots around these areas was possible due to additional funding from CCPN. In 2020-2021, the intention is to establish additional ground plots and collect LiDAR further north in the Sahtu and Beaufort-Delta regions.



*Bison on the side of Highway 3*

### **Wildlife**

ENR initiated a two-year project to develop a Climate Change Adaptation Plan for Wildlife in the NWT, working with its co-management partners. In the first year of this project, interviews with Conference of Management Authorities members, internal and external subject matter experts, target personnel from neighbouring jurisdictions, and other potential partners were conducted to collect information required to understand potential climate change impacts on NWT

wildlife. In 2020/21, further engagement will be undertaken to inform the development of the plan.

### **Protecting heritage resources, and enhancing the use of traditional and local knowledge**

ECE initiated a two-year project to conduct a vulnerability assessment for cultural places in the Kugmallit Bay region of the Beaufort Sea coast. The goal is to create accurate maps and spatial data of cultural places to facilitate management

planning by establishing the anticipated rate of destruction of cultural landscape features. This will assist in prioritizing future mitigation efforts. In 2019/20, coastal erosion rates were updated with high-resolution imagery to extend the geographic scope of the efforts to other important Inuvialuit sites. Map-interview sessions were conducted with members of the community of Tuktoyaktuk, to collect and document local and traditional knowledge. In 2020/21, work will continue on the vulnerability assessment.



Fort Good Hope elder installs a trail camera in the Ts'udé Niljné Tuyeta protected area

## 3.2 Other Initiatives

In addition to the projects that were initiated through CCPN funding, other action areas were initiated through newly acquired external and internal resources that support climate change action. Select highlights are provided below.

### Indigenous-led guardians programs

ENR is working with IGOs to support and/or implement guardian initiatives that are included in the establishment agreements for territorial protected areas. Indigenous-led guardians programs empower communities to manage ancestral lands grounded in traditional laws and values, built upon longstanding relationships with the environment. The GNWT and IGOs received

four years of funding in 2019/20 under the Nature Fund Challenge to support the establishment and management of three territorial protected areas.

The funding will be used for training, positions and on-the-land camps to build local guardians programs for Ts'udé Niljné Tuyeta, Thaidene Nënë and Dìnàgà Wek'èhodì. Protected areas established under the *Protected Areas Act* require management plans to include

climate change adaptation and mitigation considerations. The management plans are also anticipated to include further details on guardian stewardship programming. Going forward, ENR will build from existing guardians programs to conduct monitoring in territorial protected areas with specific attention to climate change considerations.



*Attendees gather inside at the Inuvik Community Greenhouse during the 2019 Young Leaders' Summit on Northern Climate Change*

### Information sharing and education initiatives with youth

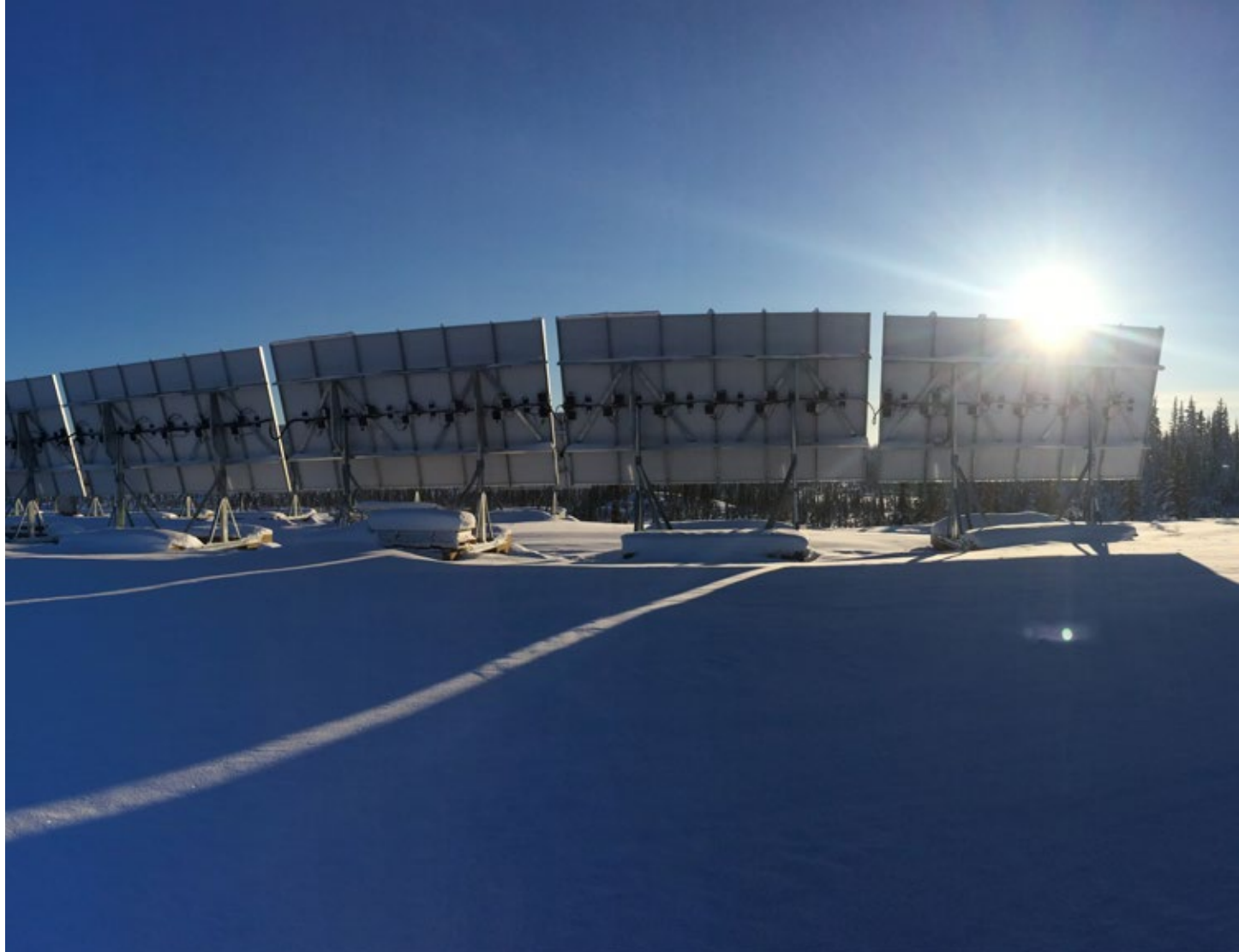
Although there are action items specifically directed towards outreach and education initiatives, it was recognized that development of youth-specific initiatives and programming was needed. The GNWT provided funding to Ecology North for the 2019 Young Leaders' Summit on Northern Climate Change. In addition, youth climate change programming was identified as a priority within the GNWT and a directed effort to strategically address youth needs was initiated in early

2020. A webinar series for youth, led by Ecology North with support from ENR, ran through January and February 2020. The series focused on gaining knowledge, skills and resources to take action to address climate change.

In 2020/21, ENR will draft a youth outreach programming plan and a youth climate change handout. These will support youth climate change-focused outreach programming with external partners. In addition to providing

educational resources to youth, ENR is funding climate change projects led by youth. One example is a social media campaign in collaboration with Ecology North, where posts are drafted by youth for youth.

A youth panel is also expected to be created to feed into the NWT Climate Change Council. The Council will be established in 2020/21 and a youth panel would be able to provide input to the GNWT and IGOs on specific climate change-related matters.



*Solar panels capturing the winter sun in Colville Lake*

## 4.0 Monitoring and Evaluating Progress

Preliminary indicators to track progress and assess the effectiveness of Action Plan implementation are provided in Part 3 of the Action Plan.

Based on these preliminary indicators, a monitoring and evaluation framework, consisting of a logic model and a performance measurement plan, was developed in 2019 for internal reporting on the Action Plan. Performance measurement indicators and targets were developed for the Action Plan. These measures

describe the information that will be collected or the activities that will be taken to monitor and evaluate progress on the actions. The GNWT will annually monitor and track the implementation of the Action Plan and progress in meeting the three goals and two cross-cutting themes identified in the CCSF. After all reporting

information is collected and the 2019-2023 Action Plan is complete, an independent review and evaluation will take place in 2024. Results of that review will inform the development of the 2025-2029 Action Plan.



*The Ramparts River and its watershed, within Ts'udé Nilíne Tuyeta Territorial Protected Area near Fort Good Hope*

## 4.1 Effectiveness of Activities in Reducing Greenhouse Gas Emissions

Accurate reporting of GHG emissions will show the GNWT's progress on meeting international climate goals. The targets to reach Goal 1 include annual internal agreement on the GHG emission calculation as well as agreement externally with the federal calculation. The indicators and targets that have been developed reflect these needs.

In 2019, successful GHG emissions reduction projects completed through the Capital Asset Retrofit Fund, Arctic Energy Alliance programs, and GHG Grant Program projects resulted in a net 6 kt CO<sub>2</sub>e decrease. Preliminary forecasting of annual GNWT-led GHG emissions reductions initiatives to 2025 is presented in Appendix D of the Energy Initiatives Report 2019/20. As additional energy projects and programs are developed and implemented in future years, the forecast of GHG emission reductions will be updated

every year and emissions are expected to continue decreasing to meet our 2030 target.

The NWT's GHG emissions fluctuate annually, depending on economic activity, climate conditions, and investments in renewable energy systems—all of which affect the total demand for fossil fuels. NWT GHG emissions are calculated by ECCC each year and published 16 months after the end of the calendar year. The most recent year for which data is available is 2018,

when the NWT's total annual emissions were 1,260 kt CO<sub>2</sub>e. The NWT has set a target to reduce GHG emissions to 1,550 kt CO<sub>2</sub>e by 2020. This target is a 3.7% reduction from 2016. By meeting this goal, the GNWT will be making progress to reduce GHG emissions by 30% below 2005 levels by 2030, as per the commitment within the PCF. Since the NWT's total GHG emissions for 2020 will be calculated by ECCC in 2022/23, it will be provided in future annual reports and considered in the 2024 evaluation.



## 4.2 Effectiveness of Activities in Improving Climate Change Knowledge

Numerous research and monitoring initiatives and programs addressing climate change knowledge gaps have been undertaken by the GNWT and its partners including IGOs and community governments, non-government organizations, the federal government, and academic institutions.

To measure the effectiveness of these activities to improve climate change knowledge, it is important to track baseline data and/or information that has been collected and documented.

Out of 54 action items related to Goal 2, 51 were initiated in

2019-2020. The work from Year 1 will be built upon in Year 2 with further identification and collection of baseline data and information needs, continued progress towards processing available data and creating data sets, and increasing outreach activities with NWT

communities and residents. Tracking information is a first step, and will support the development of indicators to reflect how the information and data is linked to the growing base of climate change knowledge.

## 4.3 Effectiveness of Activities in Building Resilience and Adapting to Climate Change

In the NWT, comprehensive research and monitoring is needed to determine approaches to build resilience and adapt to climate change. As the NWT's knowledge base grows, more

information will be available to inform plans, policies, and operational practices, to support climate change focused decision-making in the short and long term. While 26 of 28

action items under Goal 3 are underway, advancement of Goal 3 is dependent on the results obtained from the research and monitoring in Goal 2.



*Nearly complete section of the Tłı̄ch̄o Highway*

## 5.0 Resources Expended

Significant resources have been expended to implement the Action Plan. As the need to respond to climate change in the NWT continues to grow, additional capacity and funding will be required to address these challenges. Resources continue to be sought and leveraged from numerous partners, primarily from the federal government.

On page 75 of this report is an estimate of resources expended by GNWT from April 1, 2019, to March 31, 2020, to implement action items in Part 1 and to begin to implement some action areas in Part 2. It is important to note these are estimated expenditures that consider staff time and general operational costs.

These estimates include financial resources that have been provided by the federal government (including Climate Change Preparedness in the North funding from CIRNAC) and distributed by the GNWT.

In Year 1, approximately \$53.9 million in financial and human resources were expended by

the GNWT across both Part 1 and Part 2 actions. This total includes funds attributed to GNWT salaries for time spent implementing the action items and areas, associated operation and management expenses, as well as federal funding which was distributed by the GNWT for energy and adaptation related projects.

## ESTIMATE OF RESOURCES EXPENDED IN 2019/20

GOAL/THEME	GNWT-LED ACTIONS
Part 1, Goal 1	\$25,937,686
Part 1, Goal 2	\$7,771,783
Part 1, Goal 3	\$7,049,494
Part 1, Cross-Cutting Themes	\$809,352
Part 2, Goal 1	\$39,553
Part 2, Goal 2	\$720,023
Part 2, Goal 3	\$405,709
Part 2, Cross-Cutting Themes	\$11,260,000
<b>TOTAL</b>	<b>\$53,993,600</b>

## 6.0 Challenges

This first year of implementation of the Action Plan has seen successes as well as some challenges. Acknowledging and beginning to address these challenges will help to inform and modify the next steps into the second and subsequent years of Action Plan implementation.

### COVID-19 pandemic

On March 11, 2020, the World Health Organization declared a pandemic due to the rapid outbreak of COVID-19. The GNWT implemented safety measures and declared a public health emergency on March 18, 2020. As this was near the end of Year 1 of the 2019-2020 Action Plan, there were some impacts on final reporting and some action items were delayed. Some field work was cut short due to the pandemic and some reporting was given extensions. Staff within GNWT departments were redeployed to work

on COVID-19-specific tasks. While there were only minimal impacts to Year 1 Action Plan activities, it is anticipated that with the continuation of the NWT public health emergency into 2020/21, there will be significant challenges and delays for Year 2 implementation of the Action Plan.

### High costs in the North

As work begins to implement carbon pricing systems across Canada, the federal government has committed to working with the three territories to find solutions

that address their unique circumstances, including high costs of living. Due to these challenges, some of the easiest and least costly changes that could be made to reduce consumption of carbon-based fuels may already have been pursued. As the carbon tax rate increases over time, further reductions in carbon-based fuels will be increasingly difficult without considerable technological improvements that allow economically viable reductions in fuel use.



Winter time in Ts'udé Niljné Tuyeta Protected Area

### Limitations as a small jurisdiction

A challenge across all Canadian jurisdictions is capacity and funding to meet the requirements to conduct and complete the work to address climate change. While Part 1 action items are fully funded, Part 2 areas are only partially funded. The GNWT continues to work internally and with external partners to identify potential funding sources, develop funding proposals, and secure funding to move forward with initiation and implementation in the areas outlined in Part 2 of the Action Plan.

### Reliable, affordable and sustainable energy

The 2030 Energy Strategy is focused on improving the NWT's energy system. The policy, program and project initiatives being implemented are designed to ensure NWT

communities, businesses, industry and people have access to reliable, affordable and sustainable energy.

Balancing these priorities is a significant challenge. Investments in certain energy initiatives, such as refurbishing Taltson and Snare hydroelectric generating facilities or rebuilding diesel-electric plants, are required to maintain reliability and affordability but do not provide immediate benefits in terms of reducing GHG emissions. Similarly, investments in renewable energy systems help reduce GHG emissions but sometimes create challenges in terms of impacts on system reliability or energy costs. Over time, energy investments will yield more emission reductions as these projects come online.

### Governance

Climate change is an issue

that does not recognize jurisdictional boundaries. The NWT has a unique and complex governance structure, in which land, water and resource management are a shared responsibility of the GNWT, IGOs, regulatory and co-management boards and the federal government. By identifying the role of ENR and the internal and external partnerships required to meet the goals of the CCSF, the Action Plan helps to clarify the governance structure and authority for climate change-related actions. This work has led to the creation of committees, working groups and councils. However, there is a continued need to build and expand formal and informal partnerships and processes to address climate change across NWT as a whole. The NWT Climate Change Council is intended, in part, to address this challenge.



*Délı̄nę Drummers help celebrate Délı̄nę's UNESCO status*

## 7.0 Next Steps

The GNWT will continue providing annual progress reports for Year 2 (2020/21), Year 3 (2021/22), and Year 4 (2022/23). Updates on activities under the Energy Strategy and NWT Carbon Tax will continue to be summarized within future annual reports, and ENR, INF and FIN will work

collaboratively to ensure the implementation of the linked initiatives under Goal 1 are coordinated. In 2024/25, an evaluation and formal review of the CCSF and Action Plan will be conducted by an independent third party to assess the progress made towards the outlined goals of the CCSF and Action Plan

during the first five years of implementation. The findings from the review, along with emerging issues, new technologies and new opportunities, will inform potential revisions to the CCSF and support the development of the 2025-2029 Action Plan.

## 7.1 NWT Climate Change Council

As mentioned on page 25, during an August 2020 meeting, representatives from IGOs expressed support for the establishment of an NWT Climate Change Council. ENR will continue to work with IGOs in Year 2 (2020/21) to establish a

Council and finalize a Terms of Reference. The Council will provide mechanisms to include important perspectives and expertise from youth, Elders, and other external partners. Once in place, the Council will offer guidance and input on the

implementation of the Action Plan to ensure it remains effective and relevant. The Council could also guide the GNWT on how to best support IGOs and communities in addressing climate change.



*Setting up a frame for hide tanning in Łutselk'e*

## 7.2 Looking Ahead

The NWT's climate will continue to warm and change, and the GNWT is committed to addressing the current and future climate change impacts and potential opportunities. The GNWT will continue to work collaboratively with IGOs, community governments, federal, territorial and provincial governments, industry, NGOs, and academic institutions to identify funding opportunities, and form or strengthen partnerships which will allow for the full implementation of the Action Plan.

In 2020/21, 15 new positions across five departments were created to allow the GNWT to be better positioned to comprehensively implement the Action Plan. However, further funding to support these positions is still required.

As more information regarding climate change becomes available, a flexible approach to addressing climate change in the NWT will be necessary. Decisions made at all levels to address and respond to climate

change should consider the full range of climate change impacts, including changes in the natural environment, the associated increase in needs and costs related to infrastructure, and concerns related to human health, food security, and cultural well-being. Decisions should also be informed by potential economic development opportunities related to climate adaptation.

# Appendix A:

## Summary of progress to date for Part 1 Action Items and Part 2 Areas for future collaboration

### PART 1: ACTION ITEMS

#### GOAL 1

ACTION ITEMS	LEAD, PARTNERS	2019/20 PROGRESS TO DATE	STATUS
<b>1.1 Transitioning to a lower carbon economy</b>			
1.1A - Implement the actions and initiatives outlined in the 2030 Energy Strategy: Energy Action Plan 2019-2022 <sup>1</sup>	INF, AEA, NTPC, HCorp, federal departments, IGOs, community governments, industry, NGOs	Detailed reporting on projects and initiatives completed in 2019/20 to implement the 2030 Energy Strategy are provided in the Energy Initiatives Report 2019/20.	On track
1.1B - Implement NWT carbon pricing	FIN	Detailed reporting on the implementation of carbon pricing through the NWT Carbon Tax is provided in the NWT Carbon Tax Report 2019/20.	Complete

<sup>1</sup> This action item intends to address recommendations from Office of the Auditor General of Canada's 2017 report on climate change in the NWT. Refer to the 2030 NWT Climate Change Strategic Framework (Appendix A) for further details.

ACTION ITEMS	LEAD, PARTNERS	2019/20 PROGRESS TO DATE	STATUS
<b>1.2 Addressing climate change in environmental assessment and licensing/permitting of resource development and other projects</b>			
1.2A - Collaborate on policy development, information requirements and tools to integrate climate change considerations	ENR, ITI, Lands, <b>regulatory boards</b> , industry, NGOs	<p>The Mackenzie Valley Environmental Impact Review Board finalized a perspectives paper, Evolving Environmental Impact Assessment in the Mackenzie Valley and Beyond (released April 2020), outlining the need to consider climate change resilience of projects and working to align environmental impact assessment processes and decisions with carbon policy in Canada. The GNWT provided input and continues to discuss the importance of climate change considerations in environmental impact assessment in the NWT with the Review Board.</p> <p>The GNWT also provided comments on the ECCC's draft Strategic Assessment of Climate Change, which applies mostly to the Inuvialuit Settlement Region. The SACC outlines the inclusion of the requirement for proponents to provide basic GHG emission information, GHG emission mitigation measures, and information on how a proposed project is resilient to both the current and future impacts and risks of a changing climate.</p>	On track
1.2B - Include climate change considerations in GNWT submissions to regulatory boards	ENR, GNWT	The GNWT continues to develop and enhance the way climate change considerations are provided to the Mackenzie Valley Environmental Impact Review Board, Environmental Impact Review Board (Inuvialuit), and regulatory boards in regulatory submissions.	On track
<b>1.3 Determining the potential value of natural carbon sinks</b>			
1.3A - Undertake work to estimate carbon stored in NWT ecosystems	ENR, FIN, academia, NRCan (CFS), NGOs	Through a partnership with an academic institution, work is underway to explore methods to estimate carbon stored in NWT ecosystems.	On track



ACTION ITEMS	LEAD, PARTNERS	2019/20 PROGRESS TO DATE	STATUS
<b>1.4 Improving GHG emissions tracking and reporting</b>			
1.4A - Improve GNWT emissions tracking	ENR, INF, ECCC	<p>ENR engaged with other territorial departments and NTPC to ensure that data used to calculate GNWT corporate emissions were complete and robust. A memorandum of understanding (MOU) was developed with NTPC to facilitate the transfer of data to ENR to improve GHG emission calculations. The MOU is anticipated to be signed in 2020/21.</p> <p>To support robust data entry, an initiative across the GNWT was led by ENR to improve the accuracy of utility/fuel data entry to inform corporate GHG emissions reporting. ENR also received specific data that were previously not accessible that will improve the GNWT's ability to accurately report on GHG emissions.</p> <p>Significant progress has been made to develop the groundwork for better emissions tracking in future years.</p>	On track
1.4B - Refine GNWT and NWT reporting methods <sup>2</sup>	ENR, INF, FIN, ECCC	<p>ENR engaged with ECCC to discuss the type of data being used by the federal government to calculate NWT GHG emissions. Progress was made to ensure that emissions calculated by ECCC aligned with emissions calculated by the GNWT. INF is exploring options for improving its tracking and reporting of GHG emissions reductions from energy projects being implemented in the NWT by external partners.</p>	On track

<sup>2</sup> This action item intends to address recommendations from Office of the Auditor General of Canada's 2017 report on climate change in the NWT. Refer to the 2030 NWT Climate Change Strategic Framework (Appendix A) for further details.

## PART 1: ACTION ITEMS

### GOAL 2

ACTION ITEMS	LEAD, PARTNERS	2019/20 PROGRESS TO DATE	STATUS
<b>2.1 Supporting the GNWT Knowledge Agenda – climate change research</b>			
2.1A - Leverage existing research programs to incorporate community-based participation through the development of community and academic partnerships <sup>3</sup>	GNWT, IGOs, academia, community governments, NGOs	<p>ENR helped organize and deliver Tuktoyaktuk Science Day in August 2019, which included meetings for federal research funders with the community, regional IGOs and the Tuktoyaktuk Community Corp.</p> <p>A community science day offered an opportunity for scientists and community members to share experiences, build partnerships, and guide research towards issues that are Northerners, and especially youth, in research and ensuring integration of traditional knowledge in research where appropriate, was highlighted.</p>	On track
2.1B - Support additional interdisciplinary research addressing economic, health, social and environmental change related to climate change	GNWT, IGOs, academia, community governments, NGOs	In June 2019, the <i>GNWT Knowledge Agenda: Action Plan 2019-2024</i> was released, and climate change research is reflected as a key cross-cutting theme in its implementation. Partnerships with academic institutions, such as the GNWT-Laurier partnership, are also supporting climate change focused research.	On track
2.1C - Link traditional and local knowledge holders with researchers in discussions or research about climate change	GNWT, IGOs, academia, community governments	Not scheduled to be initiated in 2019/20. This action is delayed because the GNWT is in the process of setting up the NWT Climate Change Council which will provide a forum to link traditional and local knowledge holders with researchers to discuss climate change. Significant progress is expected next year when the NWT Climate Change Council will be in operation.	Not yet initiated
2.1D - Work with other jurisdictions, industry and academia on climate change related research, development and best practices for public infrastructure	INF	INF participated in the National Executive Forum of Public Property, where climate change is actively discussed, and in the National Research Council National Codes Commission Standing Committee for Energy Conservation in Buildings, which is responsible for developing the National Energy Code of Canada and contributes to reducing energy and greenhouse gas emissions from buildings.	On track

<sup>3</sup> This action item intends to address recommendations from Office of the Auditor General of Canada's 2017 report on climate change in the NWT. Refer to the 2030 NWT Climate Change Strategic Framework (Appendix A) for further details.

ACTION ITEMS	LEAD, PARTNERS	2019/20 PROGRESS TO DATE	STATUS
2.1E - Collaborate with the Transportation Association of Canada and the Canadian Permafrost Association on climate change related initiatives	INF, ITI (NTGS)	The GNWT actively participated in Transportation Association of Canada and Canadian Permafrost Association meetings throughout 2019/20.	On track
<b>2.2 Supporting conservation network planning</b>			
2.2A - Develop a renewed strategy for conservation network planning	ENR, Lands, EIA, IGOs, NGOs, land use planning boards	Conservation network planning is a key priority of <i>Healthy Land, Healthy People: GNWT Priorities for Advancement of Conservation Network Planning 2016-2021</i> . This work has not been initiated due to other priorities that have been achieved, including promulgating the <i>Protected Areas Act</i> and work towards the establishment of three territorial protected areas. Conservation network planning will continue to be a key priority in the renewed conservation work plan that will be developed in 2021.	Not yet initiated
<b>2.3 Enhancing the use of traditional and local knowledge</b>			
2.3A - Build climate change education into the Take A Kid Trapping and hunter education programs	ENR, IGOs, MACA, HSS	Work was initiated to integrate climate change programming into the Take A Kid Trapping program and hunter education programs. Additionally, ENR ran two multi-disciplinary camps for high school youth: the Tundra Science and Culture Camp and the Forest Ecology/Keepers of the Land Camp. These camps take place every summer and climate change is now holistically incorporated into the teaching materials and activities.	On track

ACTION ITEMS	LEAD, PARTNERS	2019/20 PROGRESS TO DATE	STATUS
<p>2.3B - Support the collection, analysis or synthesis of traditional knowledge through the NWT Cumulative Impact Monitoring Program to better understand environmental trends and cumulative impacts for use in decision-making</p>	<p>ENR, IGOs, community governments, co-management boards, academia</p>	<p>NWT CIMP funded six traditional knowledge focused projects in 2019/20, all of which were led by communities. Of the six projects, three were completed in 2019/20.</p> <p>NWT CIMP supports a project in partnership with Łutselk'e Dene First Nation that is exploring how to incorporate traditional and local knowledge in decision making. NWT CIMP will be considering how to implement results into its program in the coming year.</p> <p>The annual results workshop was held in Tulita in December 2019, and traditional knowledge and climate change were discussed throughout the workshop.</p> <p>NWT CIMP released one <b>Northern Environmental Research Bulletin</b> in 2019/20 for a traditional knowledge research project focused on caribou.</p>	<p>On track</p>
<p><b>2.4 Improving management and use of data / information<sup>4</sup></b></p>			
<p>2.4A - Inventory and evaluate NWT environmental data and data products to support climate change actions</p>	<p>ENR, ISSC, ITI (NTGS)</p>	<p>ENR worked on an inventory and preliminary evaluation of NWT environmental data and data products to support climate change actions. This included tracking how GNWT data and information was being collected and stored, and documenting climate change related data and information needs and gaps to improve climate change knowledge.</p>	<p>On track</p>

<sup>4</sup> This action item intends to address recommendations from Office of the Auditor General of Canada's 2017 report on climate change in the NWT. Refer to the 2030 NWT Climate Change Strategic Framework (Appendix A) for further details.

ACTION ITEMS	LEAD, PARTNERS	2019/20 PROGRESS TO DATE	STATUS
2.4B - Develop and implement a central online resource to share climate change knowledge and information	ENR, FIN (ISSC)	ENR has undertaken important steps to initiate the development of a Climate Change Portal, including a jurisdictional scan of other central online resources, and collecting and reviewing feedback on the role and benefits of a Portal received through discussion with data and information collectors. A potential candidate platform to share information was identified by ENR and business case writing was initiated in 2019/20. Work will continue in 2020/21 to develop and implement a Climate Change Portal to meet both internal and external user needs and will facilitate the dissemination of climate change results and products.	On track
2.4C - Improve dissemination of climate change results and products	ENR	See response to 2.4B.	On track
<b>2.5 Climate and weather</b>			
2.5A - Evaluate monitoring network requirements, potential monitoring redundancies and prioritize monitoring gaps	ENR, ECCC (MSC)	ENR initiated an evaluation of the GNWT's climate monitoring network. Work will continue in 2020/21 to develop options to enhance climate monitoring in the NWT. A memorandum of understanding with ECCC will facilitate shared network monitoring in the upcoming year.	On track
2.5B - Continue, and develop options to enhance, climate monitoring at NWT monitoring sites	ENR, ECCC, PCA, Industry, Academia	In December 2019, the GNWT signed a memorandum of understanding with ECCC to share weather and climate information and formalize the establishment of the Canadian Council for Weather and Climate Monitoring. ENR actively participated in the council in 2019/20 and raised a number of priorities with regards to climate monitoring in the NWT.	On track
2.5C - Develop a plan for a northern climate hub to support delivery of climate services and products	ENR, ECCC (CCCS)	ENR, along with the Government of Yukon and the Government of Nunavut, met several times in 2019/20 with ECCC's Canadian Centre for Climate Services to discuss northern climate service needs and to provide input to guide the development and proposed operation of a northern climate services hub. An initial concept note was developed and a budget proposal based on the concept note was submitted by ECCC for consideration for Budget 2020 in January 2020. However, announcements regarding potential funding were delayed due to COVID-19.	On track

ACTION ITEMS	LEAD, PARTNERS	2019/20 PROGRESS TO DATE	STATUS
2.5D - Develop climate projections and climate indices	ENR, ECCC, NRCan (CFS), Academia	ENR provided input into the ECCC <a href="#">Climate Atlas</a> of Canada and <a href="#">ClimateData.ca</a> online resources, which were released in late 2019. ENR will continue to work on the development of projections and indices collaboratively with ECCC in 2020/21.	On track
2.5E - Continue to monitor rates and dynamics of coastal erosion along the Beaufort Sea	NRCan (GSC), community governments, Federal Departments, ECE (ARI)	Monitoring led by Natural Resources Canada, in partnership with the communities of Tuktoyaktuk, Aklavik and Paulatuk, continued in 2019/20.  A co-managed project with the Hamlet of Tuktoyaktuk produced several plain language summaries on coastal erosion and flooding that were delivered to the community during an extensive engagement in March 2020.	On track
<b>2.6 Permafrost</b>			
2.6A - Collect existing ground temperature data along the Dempster and Inuvik-Tuktoyaktuk highways	ITI (NTGS), INF, NRCan (GSC)	Various reports were published and are available online through NTGS's <a href="#">Open Report</a> database.	On track
2.6B - Develop a plan to undertake regional terrain sensitivity and geohazard mapping and monitoring	ITI (NTGS), ENR, ISSC, NRCan (GSC), Academia	The project began in 2019 and has been presented at numerous venues to northern, scientific and GNWT audiences.	On track
2.6C - Compile ground temperature and geotechnical datasets for the NWT	ITI (NTGS), INF, ENR, NRCan (GSC), Academia	116 Inuvik-Tuktoyaktuk Highway (ITH) ground temperature-monitoring sites were maintained and downloaded in 2019. 28 additional ground temperature stations were installed along the Dempster Highway and ITH, adding to the existing 16 sites along the Dempster Highway to expand the permafrost monitoring network for the region.	On track
2.6D - Undertake community terrain mapping through a pilot study of two communities	ITI (NTGS), ENR, Academia	A publication was released August 8, 2019 which provides terrain mapping around Tuktoyaktuk, Inuvik, Tsiigehtchic and Fort McPherson. It was also presented at the Canadian Permafrost Conference.	On track

ACTION ITEMS	LEAD, PARTNERS	2019/20 PROGRESS TO DATE	STATUS
2.6E - Undertake permafrost related research along the Dempster and Inuvik-Tuktoyaktuk highways	ITI (NTGS), INF, NRCan (GSC), Academia	<p>The NTGS is working in partnership with the Inuvialuit Land Administration to train environmental monitors on permafrost data collection and field observation protocols. Permafrost monitoring was established at a site where a thaw slump/landslide threatens the Dempster Highway.</p> <p>This work was presented at the NWT Geoscience Forum, Inuvik Permafrost Monitoring workshop and at the NWT Project Management Conference.</p>	On track
2.6F - Collaborate and advise on academic permafrost research in NWT	ITI (NTGS), Academia	<p>The NTGS permafrost science group has contribution agreements with numerous universities and is actively engaged in several projects that leverage academic expertise. Specific details on the partnerships and work can be found on the NTGS website.</p>	On track
2.6G - Work to increase human resource capacity to enable progress on permafrost-related actions	ENR, NRCan (GSC)	<p>A geotechnical data scientist and permafrost specialist were staffed as term positions through external funding; however, further funding is needed to ensure ongoing human resource capacity. New funding approved in 2020/21 provided indeterminate funding for these critical positions. Further detail will be included in the next annual report.</p>	On track
<b>2.7 Water and wetlands</b>			
2.7A - Continue NWT water quality and water quantity monitoring which can contribute to the assessment of climate-related changes in quality and flow over time (including Community Based Water Monitoring Programs)	ENR, ECCC, IGOs	<p>ENR worked with Indigenous and community water partners to support aquatic community-based monitoring and research programs as well as transboundary aquatic monitoring programs. The need to consider and integrate climate change considerations in water monitoring and assessments is important and will be increasingly included moving forward. Water quality results from the community-based aquatic monitoring program can be found online at <a href="https://mackenziedatastream.ca/">https://mackenziedatastream.ca/</a>.</p> <p>A literature review of climate change related work in the Slave/Hay River basins to identify current state of knowledge in the transboundary area was completed.</p>	On track

ACTION ITEMS	LEAD, PARTNERS	2019/20 PROGRESS TO DATE	STATUS
2.7B - Continue to support the snow survey network to contribute to a better understanding of climate-related change in winter precipitation	ENR	Snow survey monitoring continues to contribute to a better understanding of change in winter precipitation and informs the spring water levels outlook which is available on the ENR website.	On track
2.7C - Undertake NWT Wetland Inventory Mapping	Ducks Unlimited Canada, IGOs	Through a partnership with the GNWT and IGOs, Ducks Unlimited Canada has been leading additional NWT wetland mapping classifications of three key areas: Dinàgà Wek'èhodi, Ts'udé Niljné Tuyeta, and Thaidene Nënë. Advanced wetland mapping methods were developed for Dinàgà Wek'èhodi, and are now being applied across the other regions.	On track
2.7D - Assess cumulative impacts to water, including climate change, as reflected in the NWT Cumulative Impact Monitoring Program Water Blueprint	ENR, Academia, ECCC, IGOs, community	<p>NWT CIMP funded 13 water focused projects in 2019/20, seven of which were completed. Each of the projects included community involvement.</p> <p>The annual results workshop was held in Tulita in December 2019, and traditional knowledge and climate change were discussed throughout the workshop as part of the three themes (water and fish; caribou and harvesting; changes - land and people).</p>	On track
<b>2.8 Forests and vegetation</b>			
2.8A - Monitor changes to forest growth, productivity, health and regeneration after natural and human-caused disturbances in the context of the changing climate	ENR, NRCan (CFS), Academia	This monitoring is aiming to better understand forest regeneration post-fire in light of a changing climate. In summer 2019, the regenerated forest stand inventory and interpretation for the Sambaa K'e burn site was completed. A post-fire regeneration report for multiple sites is planned for 2020/21.	On track



ACTION ITEMS	LEAD, PARTNERS	2019/20 PROGRESS TO DATE	STATUS
2.8B - Conduct vulnerability assessments for forest landscape areas of interest	ENR, NRCan (CFS)	<p>Conducting vulnerability assessments for forest landscape areas of interest is a two phased action item. In 2019/20 work progressed on an NWT Forest Baseline Report (Phase 1). The draft report outlines a comprehensive literature review of studies primarily conducted by the Canadian Forest Service on forest ecology in the NWT. It is focused on the following themes: climate, forest inventory and productivity, permafrost thaw, wildfire, insects and pathogens, drought, flooding, carbon balance, and caribou habitat. The report will be finalized in 2020/21 following Canadian Forest Service review and will serve as a reference resource for any future projections of forest conditions.</p> <p>To initiate Phase 2, a workshop was held on March 4-5, 2020 in Yellowknife to identify key climate change vulnerabilities to NWT forests and develop options for incorporating adaptation into forest management, wildlife management, and land use planning. Participants represented the GNWT and federal government. Results of the workshop and ongoing progress on Phase 2 will be available in 2020/21 and will inform next steps, including engagement with IGOs.</p>	On track
2.8C - Improve understanding of changing wildland fire regimes	ENR, NRCan (CFS), Academia	Research programs are ongoing via a multi-year field program to access frequency, location and size of wildfire occurrence over the last 200 years, and document changes over time.	On track
2.8D - Produce baseline NWT-wide vegetation classifications	ENR, ISSC, NRCan (CFS)	Progress on baseline NWT-wide vegetation classifications in 2019/20 includes: the re-measurement of all multi-source vegetation inventory (MVI) permanent sample plots, initiating mapping of permanent sample plots in the Hay River area, and acquisition of satellite imagery for analysis. Work will continue over 3 years to classify vegetation to better assess climate change impacts on forest carbon fluxes, forest health and overall contribution of forests to the ecosystem in the Taiga Plains.	On track
2.8E - Complete forest health surveys and reporting	ENR, NRCan (CFS)	The 2019 annual forest health survey was completed in summer 2019 and data was compiled for the 2019 NWT Forest Health Report and Newsletter. The newsletter and report have been published on the ENR website.	On track

ACTION ITEMS	LEAD, PARTNERS	2019/20 PROGRESS TO DATE	STATUS
<b>2.9 Wildlife</b>			
2.9A - Conduct wildlife climate change vulnerability assessments <sup>5</sup>	<b>ENR, IGOs, Resource Management Boards, ECCC, Academia</b>	Work on wildlife climate change vulnerability assessments for species at risk was initiated. A final report of assessment results will be available in 2020/21. Following completion of vulnerability assessments for species at risk, a second phase will be initiated to scope in additional species, including other keystone species, harvested species, and species of cultural and spiritual significance.	On track
2.9B - Continue monitoring invasive and non-indigenous species and assess impacts from range shifts on wildlife	<b>ENR, Resource Management Boards, IGOs, ECCC, Academia</b>	As part of the NWT Invasive Species Project, limited monitoring of invasive and non-indigenous species continued through tracking species distribution, monitoring for new and emerging wildlife diseases, and annual forest pest and pathogen surveys. Citizen science played an important role, through reports on wildlife and plant species to ENR regional offices and internet sites (e.g. NWT Species Facebook group, iNaturalist).  A summary of information, risk assessment, and recommendations regarding arthropod-borne zoonoses within the NWT was drafted and will be finalized in 2020/21.	On track
2.9C - Establish the NWT Pests, Pathogens and Invasive Species Council	<b>ENR, NWT PPISC, IGOs, Resource Management Boards</b>	A working group was established and met twice in 2019 to advance the development of the NWT Pests, Pathogens and Invasive Species Council (PPISC). To date, it includes ENR, ITI and the Wek'ezhii Renewable Resources Board. The Council will support rapid response programs and educational materials on current and future pests, pathogens and invasive species issues due to the changing climate.	On track
2.9D - Utilize the NWT Pests, Pathogens and Invasive Species Council to support rapid response programs and educational materials on future pests, pathogens and invasive species issues due to the changing climate	<b>ENR, NWT PPISC</b>	This action has not been initiated, as the NWT Pests, Pathogens and Invasive Species Council is not yet established. (See Action Item 2.9C for further details.)	Not initiated yet

<sup>5</sup> This action item intends to address recommendations from Office of the Auditor General of Canada's 2017 report on climate change in the NWT. Refer to the 2030 NWT Climate Change Strategic Framework (Appendix A) for further details..

ACTION ITEMS	LEAD, PARTNERS	2019/20 PROGRESS TO DATE	STATUS
2.9E - Disseminate current and new information on the health and distribution of wildlife, including diseases and parasites	ENR	Visible diseases or pathogens are tracked using hunter interviews and self-reporting using sample kits, through regular wildlife health surveillance through regional ENR offices and in collaboration with academic and other partners. Results are reported at regional wildlife workshops, renewable resource board meetings or community meetings as part of wildlife health reporting. Scientific manuscripts and plain language summaries are produced by academic partners and shared with contributing communities on a project basis. A portion of cases are summarized in quarterly and annual reports of the Canadian Wildlife Health Cooperative.	On track
2.9F - Continue using remote sensing techniques to assess wildlife habitat and impacts due to climate change	ENR, ECCC (CWS)	Support of academic research focusing on changing vegetation due to a warming climate in the range of the Bathurst caribou herd continued. The research program includes three areas: satellite imagery used to determine where and how much the Arctic is greening or browning; on the ground sampling from trees and shrubs in areas identified from satellite data as greening and from areas that are not demonstrating any change in vegetation to help determine the implications of greening; and looking at caribou populations and movements in combination with information on growth of vegetation to determine effects on caribou. A presentation was provided by the University of Alberta on August 14, 2019 in Yellowknife on "Vegetation changes in the North: What shrub dendrochronology can tell us about Bathurst Caribou range condition".	On track
2.9G - Enhance the knowledge of species presence, distribution and status to determine future needs based on a changing climate	ENR, Resource Management Boards, IGOs, ECCC, DFO	The NWT Species General Status Ranking Program updates species information and ranks every five years. The next update is scheduled for 2020/21. It is the official program tracking the arrival of new species, and change in status biological status arising from changes in our ecosystems, including climate change. The work compiles results from Action item 2.9B and other sources, and is conducted in collaboration with all agencies responsible for biodiversity in the NWT and in coordination with a national working group to allow for sharing resources and expertise in Canada.	On track

ACTION ITEMS	LEAD, PARTNERS	2019/20 PROGRESS TO DATE	STATUS
<p>2.9H - Assess cumulative impacts to caribou, including from climate change, as reflected in the NWT Cumulative Impact Monitoring Program Caribou Blueprint</p>	<p><b>ENR,</b> Academia, IGOs, community governments</p>	<p>NWT CIMP funded eight caribou focused projects in 2019/20, two of which were completed in 2019/20. Each of the projects included community involvement.</p> <p>The annual results workshop was held in Tulita in December 2019, and traditional knowledge and climate change were discussed throughout the workshop as part of the three themes (water and fish; caribou and harvesting; changes - land and people).</p> <p>NWT CIMP released one Northern Environmental Research Bulletin in 2019/20 for a TK research project focused on caribou (2019 Volume 4, Issue 18). An archive of all Bulletins is available on the ENR website.</p>	<p>On track</p>
<p><b>2.10 Fish and marine mammals</b></p>			
<p>2.10A - Continue to improve baseline monitoring of species health and distribution with an emphasis on priority species of marine, anadromous and freshwater fishes, and marine mammals</p>	<p><b>DFO, ECCC,</b> NRCan, IGOs, Resource Management Boards</p>	<p>DFO contributed to improving the collection of baseline conditions and ecosystem monitoring through a series of community based monitoring programs across the NWT. Programs include: Canadian Beaufort Sea – Marine Ecosystem Assessment program; Joint Ocean Ice Study and Beaufort Gyre Project; Beluga Health Monitoring program; Ringed Seal Monitoring program; and Great Slave Lake Stock Assessment Monitoring program.</p> <p>DFO reported on baseline conditions and the trends in key Arctic Ocean ecosystem variables in the <b>State of the Arctic Ocean</b> report series. The most recent report, <b>Canada's Oceans Now: Arctic Ecosystems</b> was prepared in 2019/20 and provides new knowledge and known trends for marine areas of the Canadian Arctic, informed by scientific and traditional knowledge.</p>	<p>On track</p>

ACTION ITEMS	LEAD, PARTNERS	2019/20 PROGRESS TO DATE	STATUS
2.10B - Continue monitoring temperature-dependent contaminants in subsistence species	DFO, ECCC, IGOs, Health Canada (guidelines)	<p><b>Biological Effects of Contaminants on Arctic Wildlife and Fish (A Summary for Policy-Makers)</b> was published through the Arctic Monitoring and Assessment Program (AMAP). As part of this program, concentrations of persistent organic pollutants are assessed every second year.</p> <p>Additionally, in 2019, DFO led a community-based annual monitoring program of mercury in beluga at Hendrickson Island (Beaufort Sea), as part of a program conducted collaboratively with Inuit, the Fisheries Joint Management Committee and the Northern Contaminants Program (through CIRNAC). Results are reported through AMAP.</p>	On track
2.10C - Continue to monitor impacts of diseases and parasites on species	DFO, Health Canada, IGOs	DFO continues to monitor impacts of diseases and parasites on species. In 2019, DFO reported results of a community-based annual monitoring program of viruses and other diseases in beluga at Hendrickson Island (Beaufort Sea), as part of a program conducted collaboratively with Inuit, the Fisheries Joint Management Committee and the Northern Contaminants Program (through CIRNAC). Results are published episodically in the primary scientific literature.	On track
2.10D - Assess cumulative impacts to fish, including climate change, as reflected in the NWT Cumulative Impact Monitoring Program Fish Blueprint	ENR, Academia, DFO, IGOs, community governments	<p>NWT CIMP funded nine fish focused projects in 2019/20, three of which were completed. The annual results workshop was held in Tulita in December 2019, and traditional knowledge and climate change were discussed throughout the workshop as part of the three themes (water and fish; caribou and harvesting; changes - land and people).</p> <p>NWT CIMP released a Northern Environmental Research Bulletin in 2019 for a scientific research project focused on arctic salmon (2019 Volume 4, Issue 17). An archive of all Bulletins is available on the ENR website.</p>	On track

ACTION ITEMS	LEAD, PARTNERS	2019/20 PROGRESS TO DATE	STATUS
<b>2.11 Human health and well-being</b>			
2.11A - Communicate alerts and develop advisories related to extreme weather, natural disasters impacting health, zoonotic diseases and poor outdoor air quality	HSS, ENR, MACA	<p>HSS released its first public health advisory for extreme heat exposure in July 2019. The advisory affected seven communities (Kakisa, Enterprise, Fort Smith, Hay River, Jean-Marie River, Fort Simpson, and Fort Providence) and lasted for 13 days.</p> <p>Two public health advisories for wildfire smoke exposure affecting ten communities were also released. HSS is developing a Standard Operating Procedure for the release of air quality advisories to be completed in 2020/21.</p>	On track
<b>2.12 Public safety</b>			
2.12A - Ensure residents, first responders, communities and the GNWT are better prepared to deal with the impacts of climate-related hazards	MACA, community governments, IGOs, NWTAC, PSC, NRCan (GSC)	<p>In May 2019, an NWT Emergency Management Organization Public Awareness Campaign on Emergency Preparedness was launched. This involved newspaper and radio ads on flood preparedness, emergency preparedness weekly activities, and emergency preparedness information brochures being sent out.</p>	On track
2.12B - Update community emergency plans and incorporate methods for identifying and monitoring climate change related hazards and adapting to the increase in frequency and severity of such hazards	MACA, community governments, IGOs, GNWT	<p>Three community workshops were delivered in Ulukhaktok, Jean Marie River and Wrigley to update their emergency plans.</p>	On track
<b>2.13 Culture and heritage</b>			
2.13A - Continue research to assess impacts to heritage resources from climate-driven landscape disturbances	ECE, IGOs	<p>ECE continued research, funded by the Canadian Mountain Network, on climate-driven impacts to culturally significant heritage resources. Research focused on monitoring known alpine ice patches and wood caribou fences. Final reporting for both studies will be available in 2020/21 and a peer-reviewed article on mitigating forest fire risks to mountain caribou fences was published in July 2020.</p>	On track

ACTION ITEMS	LEAD, PARTNERS	2019/20 PROGRESS TO DATE	STATUS
<b>2.14 Public and community infrastructure</b>			
2.14A - Complete community infrastructure risk assessments and high level adaptation options	<b>MACA, ENR, NWTAC, community governments, IGOs</b>	MACA initiated an assessment of climate change impacts on public and community infrastructure in NWT communities, including a high level desktop infrastructure climate change risk assessment and identification of adaptation options. The report will be finalized in 2020/21 and recommendations will be shared with communities. It is anticipated the results of the climate change risk assessment will support communities in making informed decisions about existing and future infrastructure, as well as inform the need for community-specific risk assessments.	On track
2.14B - Seek funding to fill community infrastructure gaps	<b>MACA, INFC, NWTAC, community governments, IGOs</b>	<p>The GNWT increased funding to community governments, which will continue over the next three years. This additional funding and new federal infrastructure funding programs are allocated to address community infrastructure gaps. In addition, in the NWT, funding for community governments in the Investing in Canada Program is targeted to improving community roads and solid waste sites.</p> <p>MACA supports community governments as they continue to plan their infrastructure priorities through the capital planning process, as well as with project implementation and applications for funding. Community governments continued to develop land use plans and strategic plans that consider climate-related risks and priorities, which influence the priorities that are represented on community government capital plans</p>	On track

ACTION ITEMS	LEAD, PARTNERS	2019/20 PROGRESS TO DATE	STATUS
<p>2.14C - Improve documentation of GNWT infrastructure stability via more rigorous asset management activities on both vertical (i.e. buildings) and horizontal (i.e. highways and runways) infrastructure</p>	<p>INF</p>	<p>INF drafted and implemented a ten point action plan, including updating and enhancing review and inspection processes as part of the Department's asset and life cycle management practices for public buildings and roads.</p> <p>Documentation of GNWT infrastructure stability has been improved in 2019/20. A bridge management system and a highway surface management system are in place to inspect/monitor and to identify the condition of the infrastructure so that repair, maintenance, rehabilitation or replacement can be planned. Airports are maintained through the Airport Pavement Management System. Recommendations from field inspections are prioritized based on various factors such as safety and severity of distress. INF has also undertaken a number of drainage studies which examine additional actions that can build resiliency into airport infrastructure. For GNWT buildings, snow loads and foundation systems are monitored quarterly by technical staff, and data is tracked and analyzed regularly.</p> <p>INF has also undertaken a number of drainage studies which examine additional actions that can be done to build resiliency into GNWT's infrastructure and guard against climate change and/or address the new climatic norms. As these actions are identified, INF positions the projects for funding and implementation once funding has been determined.</p>	<p>On track</p>
<p>2.14D - Update climate change risk assessments for both vertical and horizontal GNWT infrastructure<sup>6</sup></p>	<p>INF</p>	<p>Risk assessments for highways and bridges were conducted by INF to ensure safe infrastructure. INF also inspected culverts, bridges and highways to ensure safety.</p> <p>Previous reports related to roof snowloads and wood pile inspections on GNWT buildings were completed in 2018/19 and are scheduled to be completed on a 5-year cycle.</p>	<p>On track</p>

<sup>6</sup> This action item intends to address recommendations from Office of the Auditor General of Canada's 2017 report on climate change in the NWT. Refer to the 2030 NWT Climate Change Strategic Framework (Appendix A) for further details.



ACTION ITEMS	LEAD, PARTNERS	2019/20 PROGRESS TO DATE	STATUS
2.14E - Collect and analyze ground temperature data to support the general knowledge base for GNWT infrastructure planning, design, construction and climate change impact monitoring <sup>7</sup>	INF	Ground temperature data is collected at recently constructed buildings in thaw-susceptible permafrost soils to allow for ground temperature monitoring. Data is collected by INF regional project staff and sent twice yearly for review and analysis to identify anomalies which may indicate potential foundation concerns, and thereby initiate required action to protect infrastructure. Ground temperature data is also collected along the Inuvik-Tuktoyaktuk Highway and sections of Highway #3 to inform required.	On track
2.14F - Continue to explore the potential for remote sensing and other technology to acquire data to allow monitoring and analysis of settlement and movement of GNWT infrastructure <sup>8</sup>	INF, FIN (ISSC)	Application of remote sensing and other technology is new and in 2019/20 the focus was on data gathering and initial analysis. In 2020/21, further analysis will take place to determine how remote sensing and other technology could be applied and implemented.	On track

## PART 1: ACTION ITEMS

### GOAL 3

ACTION ITEMS	LEAD, PARTNERS	2019/20 PROGRESS TO DATE	STATUS
<b>3.1 Implementing the GNWT Land Use Sustainability Framework</b>			
3.1A - Integrate climate change adaptation and mitigation factors into GNWT decision processes affecting land, water and natural resources	Lands, GNWT	The <b>Land Use and Sustainability Framework</b> (LUSF) is intended to guide internal GNWT decisions on land, water, and natural resources. Further work to incorporate the nine LUSF objectives, including climate change mitigation and adaptation, into GNWT decision-making will take place in 2020-2021.	On track
3.1B - Develop climate change indicators	ENR, GNWT	Not scheduled to be initiated in 2019/20.	Not yet initiated

<sup>7</sup> This action item intends to address recommendations from Office of the Auditor General of Canada's 2017 report on climate change in the NWT. Refer to the 2030 NWT Climate Change Strategic Framework (Appendix A) for further details.

<sup>8</sup> See footnote 7

ACTION ITEMS	LEAD, PARTNERS	2019/20 PROGRESS TO DATE	STATUS
<b>3.2 Completing/reviewing regional land use plans</b>			
3.2A - Work collaboratively within regional planning processes to incorporate climate change considerations into land use plans	Lands, ENR, ITI, ECE, EIA, IGOs, Federal Government, Land Use Planning Boards and Committees	<p>The Sahtu and Gwich'in land use planning boards are responsible for development, review and amendments, and monitoring and evaluation of land use plans within their respective planning boundaries. The Sahtu Land Use Planning Board (SLUPB) initiated the five-year review of the Sahtu Land Use Plan in 2018 and held meetings with the general public and planning partners in 2018 and 2019 to discuss potential changes to the Plan. The Department of Lands participated in these sessions. In December 2019, the SLUPB released the draft five-year Review Amendment Application of the Sahtu Land Use Plan for public comment. The Department of Lands submitted comments to SLUPB on behalf of the GNWT on the draft Amendment package in February 2020.</p> <p>The Gwich'in Land Use Planning Board (GLUPB) is working to complete a review and amendment to the Gwich'in Land Use Plan that was initiated prior to 2019/20. Through its participation in these planning processes, GNWT identifies climate change considerations, as appropriate. Multi-party work (GNWT, Government of Canada, Indigenous governments and organizations) is underway to develop a process for regional land use planning in Wek'èezhii and the southeast NWT, and to complete the draft Interim Dehcho Land Use Plan. One of the GNWT's interests is that climate change considerations are appropriately reflected in these land use plans.</p>	On track
<b>3.3 Implementing the conservation network</b>			
3.3A - Establish Thaidene Nënë candidate protected area	ENR, IGOs, PCA, Lands, ITI, EIA	<p>The <i>Protected Areas Act</i> came into force June 2019. The GNWT established the Territorial Protected Area for Thaidene Nënë through regulations under the Act in August 2019. The area will be cooperatively managed by the GNWT, Łutselk'e Dene First Nation, and other IGOs (available on the <a href="#">Protected Areas Registry</a>).</p>	Complete

ACTION ITEMS	LEAD, PARTNERS	2019/20 PROGRESS TO DATE	STATUS
3.3B - Establish Dinàgà Wek'èhodi candidate protected area	ENR, IGOs, Lands, EIA, ITI, ECCC (CWS)	The <i>Protected Areas Act</i> came into force June 2019. A draft framework for an establishment agreement has been developed and is near completion between the GNWT and the Tłıchq Government. The GNWT is currently working with the Tłıchq Government and other IGOs on a proposed multilateral management agreement.	On track
3.3C - Establish Ts'udé Niljné Tuyeta candidate protected area	ENR, IGOs, Lands, EIA, ITI, ECCC (CWS)	The <i>Protected Areas Act</i> came into force June 2019. An establishment agreement was signed between the GNWT and the K'asho Got'inę and is available on the Protected Areas Registry at <a href="http://www.enr.gov.nt.ca/sites/enr/files/resources/tuyeta_establishment_agreement.pdf">www.enr.gov.nt.ca/sites/enr/files/resources/tuyeta_establishment_agreement.pdf</a> .  Work is proceeding to develop regulations to establish Ts'udé Niljné Tuyeta.	On track
3.3D - Conclude planning and decisions for remaining candidate areas	ENR, IGOs, Lands, EIA, ECCC (CWS)	The focus for 2019/20 has been on the establishment of three candidate protected areas. As such, planning and decision processes for remaining candidate areas will not begin until 2021/22.	Not yet initiated
<b>3.4 Applying permafrost expertise</b>			
3.4A - Provide permafrost expertise for NWT projects and initiatives	ITI (NTGS)	Permafrost expertise is provided as capacity allows.	On track

ACTION ITEMS	LEAD, PARTNERS	2019/20 PROGRESS TO DATE	STATUS
<b>3.5 Implementing wildlife plans/strategies (key species, species at risk, invasive species)</b>			
3.5A - Finalize and implement the Bathurst Caribou Range Plan, including the conservation of key habitats where climate change impacts are expected to be pronounced	<b>ENR</b> , Resource Management Boards, IGOs, Industry, NGOs	<p>The Bathurst Caribou Range Plan was released in August 2019 and implementation was initiated. Three workshops were held with several IGOs to document important water crossings and winter range habitat. A visioning workshop for the Caribou Guardians Coalition was held in early 2020 and three years of funding has been secured from Polar Knowledge Canada to support ongoing development of the Guardians program. A draft framework for implementing Mobile Caribou Conservation Measures has been produced.</p> <p>An NWT Recovery Strategy for Barren-ground Caribou will be released by the Conference of Management Authorities in July 2020. The recovery strategy aims to maintain or restore herd populations, support and maintain the caribou-people relationship, ensure movement and migration across their historic ranges, and promote the conditions necessary for recovery. Approaches to achieve this include a focus on monitoring, research and knowledge sharing, assessment and management of cumulative effects, and habitat and migration route protection, among others.</p>	On track
3.5B - Finalize the Boreal Caribou Range Plans, including management of climate change impacts on the ecosystem	<b>ENR</b> , ECCC, Resource Management Boards, IGOs, Industry, NGOs	<p>In August 2019, ENR finalized the Framework for Boreal Caribou Range Planning.</p> <p>In fall 2019, ENR initiated work on the Southern NWT and Wek'ezhii boreal caribou range plans. Other initiatives to support range planning included:</p> <ul style="list-style-type: none"> <li>• an NWT-wide boreal caribou habitat selection analysis and mapping project through the NWT Cumulative Impact Monitoring Program</li> <li>• the development of draft industry best practices and guidelines for projects in boreal caribou habitat</li> </ul> <p>Work is ongoing to develop an NWT Species and Habitat Viewer web mapping tool that includes a specific module for boreal caribou.</p>	On track

ACTION ITEMS	LEAD, PARTNERS	2019/20 PROGRESS TO DATE	STATUS
<b>3.6 Capturing carbon in forests</b>			
3.6A - Increase forest carbon sequestration by silvicultural practices including planting in areas that have not returned to forest after natural disturbances, and thinning in areas that are overly dense	ENR, INF, ECCC	Two areas were assessed for thinning in 2019/20, though thinning in one of the areas was not recommended. A planting assessment in the Cameron Hills area was completed in September 2019. Both thinning and planting programs will be implemented in 2021.	On track
<b>3.7 Responding to human health risks</b>			
3.7A - Promote and support health and wellness activities to build community resiliency to climate change impacts	HSS, ENR, community governments, IGOs	The climate change coordinator delivered a presentation to Community Health Representatives on climate change impacts to health. The coordinator liaised regularly with ENR Climate Change and Air Quality staff on key areas to inform planning to respond to concerns to health and well-being due to climate change.	On track
3.7B - Work with communities to identify potential cleaner air shelters, and modifications required to reduce impacts of wildland fire smoke on human health	HSS, community governments, IGOs	Evacuation plans for the five major health care facilities in the NWT were completed in 2019, with three of the facilities having completed a tabletop exercise for their respective evacuation plan. In addition, all 33 communities have identified facilities in each community suitable for use as cleaner air shelters and extreme heat event cooling centres. These identified facilities and related recommendations for improving air quality in each of the shelters were shared with community governments for review and further discussion. The Cleaner Air Sheltering in the NWT report is expected to be released in 2020/21.	On track
<b>3.8 Increasing local food security and production</b>			
3.8A - Support country food-related research, including climate change impacts to community food security	ENR, HSS, ITI, IGOs	A successful application was submitted to the Canadian Institutes of Health Research to undertake a collaborative four year research project focused on the intersection of Indigenous health and wellness, climate change and food security.	On track

ACTION ITEMS	LEAD, PARTNERS	2019/20 PROGRESS TO DATE	STATUS
3.8B - Implement a sustainable livelihoods action plan to support country food research and programs	ENR, HSS, ITI, IGOs	The <b>Sustainable Livelihoods Action Plan 2019-2023</b> was released in August 2019 and outlines collaborative actions to support country food security, traditional economy and land-based learning. Climate change is one of the plan's guiding principles. The plan is now in its first year of implementation.	On track
3.8C - Implement the NWT Agriculture Strategy to increase local food production	ITI, IGOs, community governments	<p>Key actions identified in the <b>NWT Agriculture Strategy</b> to support increased local food production were advanced.</p> <ul style="list-style-type: none"> <li>• The GNWT supported the newly formed Territorial Agri-food Association during their 2019 annual general meeting and strategic planning session.</li> <li>• Access to agricultural training and expertise for communities to meet regional and community-specific needs and improve regional and local capacity is available through the Canadian Agriculture Partnership program until March 2023.</li> <li>• A baseline to measure and monitor activities and goals, such as numbers of farmers, food producers, variety of foods produced, commercial sales volumes, exports and other indicators, was established.</li> <li>• The development of a publically available inventory which shows land that is viable and available for agricultural purposes, including within and outside of municipal boundaries will be complete in 2020/21.</li> <li>• A GNWT inter-departmental committee has been established which will review current acts, regulations, policies and guidance documents that require updating.</li> </ul>	On track

ACTION ITEMS	LEAD, PARTNERS	2019/20 PROGRESS TO DATE	STATUS
<b>3.9 Improving capacity and resilience of health and social services</b>			
3.9A - Assess if essential services can be provided during extreme weather and climate-related events	<b>HSS</b>	As part of emergency evacuation planning and tabletops, assessments of whether essential services can be provided during extreme weather and climate-related events have been initiated. Discussions are ongoing regarding the provision of essential services during an emergency/evacuation.	On track
<b>3.10 Updating community emergency plans and operations and maintenance procedures</b>			
3.10A - Address climate-related hazards and adaptation measures in updated community emergency plans and operations and maintenance procedures (e.g. floods, blizzards, wildland fires, permafrost thaw, coastal erosion)	<b>Community governments, MACA, IGOs, ENR, NRCan</b>	18 Community governments have emergency plans that are less than five years old and reflect updated information about climate change hazards/risks.	On track
<b>3.11 Enhancing wildland fire disaster mitigation</b>			
3.11A - Update and implement community wildland fire protection plans	<b>Community governments, ENR, MACA</b>	Mitigation work was completed in 2019/20 in Hay River next to West Channel and preparatory work was completed in Enterprise as part of research and mitigation work.	On track

ACTION ITEMS	LEAD, PARTNERS	2019/20 PROGRESS TO DATE	STATUS
3.11B - Support the implementation of FireSmart principles and consider the use of FireSmart programs for all communities	<b>ENR, MACA, community governments</b>	<p>In 2019/20, FireSmart information sessions were held in six communities (Sambaa K'e, Kakisa, Fort Simpson, Fort Smith, Yellowknife, and Fort Liard). During the Fort Liard information session, youth also had the opportunity to learn about firefighting. Firefighters from ENR and the Fort Simpson volunteer fire department completed cross training practices in May 2019.</p> <p>Additionally, 29 Community Wildfire Protection Plans were updated and shared with communities (updated plans will be on the ENR website in 2020/21).</p>	On track
<b>3.12 Community hazard mapping</b>			
3.12A - Design a hazard mapping program, including permafrost, flooding, wildland fire, erosion and other climate-related impacts	<b>ENR, MACA, Lands, ITI, NWTAC, community governments, NRCan, Academia</b>	<p>In 2019/20, the GNWT undertook work to support the development of a community hazard mapping program to identify hazards that represent risks to communities from thawing permafrost, flooding, wildfire, erosion and other climate related impacts. The Community Climate Change Hazard Mapping Project Advisory Team met seven times. It is led by ENR and includes representatives from ECCC, Lands, MACA, ENR, NTGS, NWT Center for Geomatics, and NWTAC. An inventory of data was developed and key data gaps identified, such as a lack of fine scale surficial geology. As a result, the team initiated a pilot project to develop a fine scale surficial geology map for one NWT community. The team will continue to meet in 2020/21 to advance the community hazard mapping program. Work has been initiated to determine the information to be included on the maps and the best way of sharing the final maps through a pilot web map developed by the team.</p> <p>(See 7.3, 7.8 and 8.9 for further work being done by ENR, the NWT Centre for Geomatics, the NTGS and Lands to support this action item.)</p>	On track
<b>3.13 Safely accessing land, water and ice</b>			
3.13A - Pilot community focused ice information products to support on-ice travel and travel in ice filled waters	<b>ECCC (CIS and CCCS), ENR</b>	The Canadian Ice Service is developing community ice products for Sachs Harbour, Tuktoyaktuk, Ulukhaktok.	On track



ACTION ITEMS	LEAD, PARTNERS	2019/20 PROGRESS TO DATE	STATUS
3.13B - Implement the SmartICE monitoring and information service in select NWT communities to facilitate safe passage over ice	<b>SmartICE, IGOs, community governments</b>	<p>In 2019/20, in partnership with Tuktoyaktuk Community Corporation and Inuvialuit Regional Corporation, SmartICE equipment was deployed, community operators have received training, and SmartICE monitoring was initiated in the Inuvialuit Settlement Region communities of Tuktoyaktuk and Paulatuk. SmartICE also participated in a community engagement meeting in Paulatuk.</p> <p>Funding has been secured for introduction of SmartICE to two other Inuvialuit Settlement Region communities in 2020/22.</p>	On track
3.13C - Incorporate extreme weather warnings into public alerting system	<b>MACA, ECCC</b>	<p><b>NWTAlert.ca</b> has been developed as a single source for alerts and other public safety messaging. Public access to alerts after broadcast, other public safety notifications, a library of past alerts, and a map to display an impacted geographical area, will be available on the site. A launch of NWT Alert is expected in 2020/21.</p>	On track
<b>3.14 Supporting the Northern Infrastructure Standardization Initiative (NISI)</b>			
3.14A - Continue active participation in the development of additional standards for northern infrastructure (NISI Phase II)	<b>INF, MACA, SCC, ENR, Housing Corporation, NWTAC</b>	<p>The GNWT and the NWTAC actively participate in the development of northern focused standards. In 2019/20, three new national standards were released:</p> <ul style="list-style-type: none"> <li>• CSA PLUS 4011.1:19 – Technical Guide: Design and construction considerations for foundations in permafrost regions</li> <li>• CSA W205:19 – Erosion and sedimentation management for northern community infrastructure</li> <li>• CSA S504:19 – Fire resilient planning for northern communities</li> </ul> <p>Work is progressing on new standards and revisions of existing standards to be released in 2020/21 to ensure recent climate change considerations are being accounted for.</p>	On track

ACTION ITEMS	LEAD, PARTNERS	2019/20 PROGRESS TO DATE	STATUS
<b>3.15 Adapting infrastructure to a changing climate</b>			
3.15A - Construct the Tłı̄chq All Season Road	INF	Following an environmental assessment and regulatory permitting, construction began on the Tłı̄chq Highway in September 2019. The 97 km long road will provide year-round access to Whatı̄, as well as increase the winter road operational season to Gamè̀tì and Wekweè̀tì by thirty to sixty days, each year. It is on track to be open to the public in November 2021. The highway construction demonstrates how the GNWT is adapting its infrastructure to respond to shorter and increasingly unpredictable winter road seasons resulting from a changing climate, particularly in the southern portion of the NWT.	On track
3.15B - Construct the Great Bear River Bridge	INF	The Great Bear River Bridge and its subsequent road alignment tie-ins to the existing Mackenzie Valley Winter Road are in the design and engineering phase. Geotechnical investigations were completed during the summer of 2019 and winter of 2020. Several community engagement sessions took place between April and November 2019. In 2020/21, further work on the project description report to facilitate applications for project construction regulatory permits, as well as additional community engagement, is planned.	On track
3.15C - Complete permitting and construct the Mount Gaudet and Prohibition Creek All Season Roads	INF	Engagement relating to the Mount Gaudet and Prohibition Creek All-Season Roads continued throughout 2019/20. Other related meetings and consultations are ongoing. Geotechnical drilling was completed in the winter of 2019/20 for certain segments of the roads; further geotechnical work is ongoing.	On track

## PART 1: ACTION ITEMS

### CROSS-CUTTING: LEADERSHIP, COMMUNICATION AND CAPACITY-BUILDING

ACTION ITEMS	LEAD, PARTNERS	2019/20 PROGRESS TO DATE	STATUS
4.1 Reflecting climate change in governance and policy tools			
4.1A - Establish internal GNWT guidance mechanisms <sup>9</sup> : <ul style="list-style-type: none"> <li>• Director-level Climate Change Working Group</li> <li>• Assistant Deputy Ministers Energy and Climate Change Committee</li> <li>• Deputy Ministers Energy and Climate Change Committee</li> <li>• Energy and Climate Change Committee-of-Cabinet</li> </ul>	Lands, GNWT	<p>Internal processes for tracking and reporting Action Plan progress were established, including semi-annual internal reporting and annual public reporting. The Director-level Climate Change Working Group has met monthly throughout 2019/20. The establishment of this working group has greatly benefitted internal communication and coordination with regards to implementing the climate change action plan and addressing climate change priorities, including key Mandate items, at the working level.</p> <p>The Director-level Climate Change Working Group, Assistant Deputy Minister’s Energy and Climate Change Committee, Deputy Minister’s Energy and Climate Change Committee, and the Energy and Climate Change Committee-of-Cabinet have all have been established. This action item is complete.</p>	Complete
4.1B - Coordinate GNWT climate change related project work	ENR, GNWT	The Climate Change and Air Quality Unit coordinated Pan-Canadian Framework reporting for 2019/20 with input from various GNWT departments, as well as internal semi-annual reporting updates on the Action Plan.	On track
4.1C - Add climate change considerations to new / revised territorial legislation and policies	ENR	The new <i>Protected Areas Act</i> was passed in June 2019. The preamble of the act states that climate change considerations must be factored into protected areas planning and management.	On track

<sup>9</sup> This action item intends to address recommendations from Office of the Auditor General of Canada’s 2017 report on climate change in the NWT. Refer to the 2030 NWT Climate Change Strategic Framework (Appendix A) for further details.

ACTION ITEMS	LEAD, PARTNERS	2019/20 PROGRESS TO DATE	STATUS
4.1D - Complete a jurisdictional scan of effective policy tools to support the Action Plan's implementation	ENR, GNWT	<p>Work was initiated to explore policy tools for climate action management and decision-making in Canadian jurisdictions.</p> <p>Ongoing participation in Canadian Council of Ministers of the Environment climate change committees ensured that considerations relevant to the NWT were factored into development of national guidance, such as the guidance on best practices in conducting climate change risk assessments (to be released in 2020).</p>	On track
4.1E - Include climate change content in existing community and Indigenous government training resources, and expand online governance training to include climate change	MACA, ENR, NGO	<p>The School of Community Government webinar series featured two webinars related to climate change in 2019/20 (Climate Change for Councilors and Climate Change).</p> <p>To support climate change knowledge building for communities, MACA and ENR partnered to deliver a three day in-person course, <i>Integrating Climate Change Measures into Municipal Planning and Decision Making</i>, through MACA's School of Community Government in Fort Simpson to 10 participants. This course is also available online.</p> <p>Action 4.1E is a cross-over with 4.6B and 4.6C.</p>	On track
<b>4.2 Pursuing funding sources for climate change initiatives</b>			
4.2A - Develop funding requests to address climate change priorities	ENR, GNWT, IGOs	ENR actively pursued funding opportunities to address climate change priorities in the NWT, to secure funding to support the implementation of Part 2 of the Action Plan, by initiating a submission to the Financial Management Board. Federal funding was also sought to implement specific Part 2 actions.	On track

ACTION ITEMS	LEAD, PARTNERS	2019/20 PROGRESS TO DATE	STATUS
<b>4.3 Establishing external guidance mechanisms to foster collaboration</b>			
4.3A - Develop options for the establishment of a NWT climate change council or advisory body <sup>10</sup>	<b>GNWT</b> , IGOs, NWTAC, NGOs, Industry	<p>The establishment of a NWT Climate Change Council was included in the Mandate. Work to establish the Council was initiated.</p> <p>A meeting was planned for March 2020 with staff from IGOs, but was cancelled due to COVID-19. The meeting was postponed to August 2020.</p>	On track
<b>4.4 Information sharing and education initiatives</b>			
4.4A - Develop and implement a climate change outreach and communication plan <sup>12</sup>	<b>ENR</b>	<p>The climate change outreach plan has been drafted and is nearing completion. Updates on the communication plan for the Climate Change and Air Quality Unit were initiated in 2019/20. An internal committee was established to help guide the completion of the outreach and communication plans.</p> <p>Various outreach activities were implemented in 2019/20, including community visits, workshops for project development and delivery of climate change webinars, among others.</p>	On track
<b>4.5 Supporting community-based monitoring efforts</b>			
4.5A - Continue community-based monitoring and implement additional community-based monitoring sites on a priority basis	<b>ENR, MACA</b> , IGOs, community governments, SmartICE	Six NWT-based projects were federally funded through the Indigenous Community-Based Climate Monitoring program. Funding was provided to Tuktoyaktuk Community Corporation, Arctic Borderlands Ecological Knowledge Society, Northwest Territory Métis Nation, K'at'l'odeeche First Nation, Dehcho First Nations, and Inuvialuit Regional Corporation.	On track
<b>4.6 Training for Indigenous and community governments</b>			
4.6A - Ensure residents, first responders, communities and the GNWT are trained to be better prepared to deal with the impacts of all hazards, ranging from low through to very high risks	MACA, community governments, NWTAC, IGOs, ECCC	MACA Public Safety staff support communities with their emergency response planning workshops. MACA Public Safety staff assisted three communities to update their community emergency plans in 2019/20, highlighting and incorporating methods for identifying and monitoring climate change related hazards.	On track

<sup>10</sup> This action item intends to address recommendations from Office of the Auditor General of Canada's 2017 report on climate change in the NWT. Refer to the 2030 NWT Climate Change Strategic Framework (Appendix A) for further details.

ACTION ITEMS	LEAD, PARTNERS	2019/20 PROGRESS TO DATE	STATUS
4.6B - Deliver workshops on adaptation, mitigation and best practices	MACA, community governments, IGOs	<p>The School of Community Government offers an online course, Integrating Climate Change Measures into Municipal Planning and Decision Making, which can be taken anytime. The School of Community Government offered a three day Climate Change Course in Fort Simpson in November 2019.</p> <p>Action 4.6B is a cross-over with 4.1E and 4.6C.</p>	On track
4.6C - Deliver climate change training through School of Community Government programming and workshops	MACA, ENR, NWTAC, LGANT, IGOs, community governments	<p>The School of Community Government webinar series featured two webinars related to climate change in 2019/20 (Climate Change for Councilors and Climate Change) and an online course, Integrating Climate Change Measures into Municipal Planning and Decision Making. All are available online.</p> <p>Action 4.6C is a cross-over with 4.1E and 4.6B.</p>	On track
<b>4.7 Adaptation planning and support (regional and local level)</b>			
4.7A - Integrate adaptation planning into emergency management, community plan and strategic plan workshop content	ENR, MACA, NWTAC, community governments	<p>MACA supported strategic planning in three communities (Behchokò, Fort Simpson and Whatì) in 2019/20. All sessions incorporated a climate change discussion. Three communities received assistance with updating their community emergency response plans. In addition, one community plan was approved, four were submitted, and seven other communities began the process of updating their plans. All communities included climate change in their community plan development.</p>	On track
4.7B - Support regional or community adaptation planning and implementation of adaptation initiatives	ENR, MACA, NWTAC, IGOs, community governments, federal departments	<p>Various communities were visited to discuss issues and identify resources, relating to adaptation planning, funding, establishing networks with the GNWT, academia, other communities, etc.</p> <p>In partnership with NWTAC, ENR recognized the Hamlet of Ulukhaktok with the Climate Change Resiliency Award, which demonstrated leadership in adapting to climate change.</p> <p>A Climate Change and Food Security Gathering project was initiated with Déljñę Renewable Resource Council and Sahtu Renewable Resource Board and postponed for 2020/21, due to COVID-19.</p>	On track

## PART 1: ACTION ITEMS

### CROSS-CUTTING: ECONOMIC IMPACTS AND OPPORTUNITIES

ACTION ITEMS	LEAD, PARTNERS	2019/20 PROGRESS TO DATE	STATUS
5.1 Estimating the overall economic cost implications of the combined impacts that may occur in the NWT due to climate change			
5.1A - Undertake a study focusing on: <ul style="list-style-type: none"> <li>Impacts on infrastructure</li> <li>Impacts on quality of life</li> <li>Impacts on economic activities</li> <li>Cost-benefit analysis of adaptation measures</li> </ul>	<b>ENR, FIN, HSS, ITI, NWTAC</b>	In 2019/20, the NWTAC and GNWT partnered to undertake a study to begin to assess the economic cost implications of climate change in the territory. The four modules in the draft Estimated Cost Implications of Climate Change in the NWT report include: the impacts of climate change on infrastructure, the impacts of climate change on quality of life for residents, the impacts of climate change on economic activities, and clarifying climate change adaptation practices. The report and a plain language summary will be finalized in 2020/21.	On track

## PART 2: AREAS FOR FUTURE COLLABORATION

A summary of progress on specific tasks within action areas that were initiated is provided below.

### GOAL 1

ACTION ITEMS	LEAD, PARTNERS	2019/20 PROGRESS TO DATE	STATUS
6.2 - Implement composting in small to medium-sized communities to reduce greenhouse gas emissions from community landfills <ul style="list-style-type: none"> <li>Undertake planning and feasibility work</li> </ul>	<b>ENR, community governments</b>	The development of compost facility standards and a guidance document to assist prospective compost facility operators have been initiated, to develop and design a facility that will meet the standard.  ENR anticipates the standard will be complete by the end of 2020/21 and support for communities to develop compost facilities will begin in the 2021/22.	Initiated

## PART 2: AREAS FOR FUTURE COLLABORATION

### GOAL 2

ACTION ITEMS	LEAD, PARTNERS	2019/20 PROGRESS TO DATE	STATUS
<p>7.1 - Enhancing the use of traditional and local knowledge</p> <ul style="list-style-type: none"> <li>Document, use and transfer climate change related knowledge as prioritized by Indigenous governments to support decision-making pertaining to action areas</li> </ul>	<p><b>IGOs, GNWT, NGOs</b></p>	<p>Though not listed as a lead, ECE was allocated funding through the Climate Change Preparedness in the North program to conduct a vulnerability assessment for cultural places in the Kugmallit Bay region of the Beaufort Sea coast. This project included interviews with members of the community of Tuktoyaktuk, to utilize their traditional and local knowledge. (See Action Area 7.9 for further details.)</p>	<p>Initiated</p>
<p>7.3 - Permafrost</p> <ul style="list-style-type: none"> <li>Establish a permafrost monitoring network for the NWT</li> <li>Establish a permafrost data management system</li> <li>Analyze collected ground temperature data</li> <li>Assess sensitive permafrost terrain and inventory permafrost-related geohazards</li> </ul>	<p><b>ITI (NTGS), Lands, ENR, INF, ECE, Federal Departments, Regulatory Boards, Industry, IGOs, community governments, NRCan (GSC, CCMEQ), Academia</b></p>	<p>The NTGS received funding through the Climate Change Preparedness in the North program for a Thermokarst Mapping project, to develop, test and implement a mapping framework to produce thermokarst and terrain sensitivity maps for (1) areas around each of the NWT communities; and then (2) to produce maps covering all of the NWT. The funding will be used to increase NWT's climate change adaptation capacity by extending the permafrost mapping technician position (located at Wilfrid Laurier University's Yellowknife research office) and to hire summer student mappers. (This project supports Action Areas 8.3, 8.4, and 8.9.)</p>	<p>Initiated</p>
<p>7.5 - Forests and vegetation</p> <ul style="list-style-type: none"> <li>Explore the use of remote sensing tools for inventory and update of vegetation cover</li> <li>Update baseline vegetation land cover inventory (2001-2010 base) for fires, land use and other climate-related changes</li> </ul>	<p><b>ENR, NRCan (CFS), Academia</b></p>	<p>ENR's Forest Management Division (FMD) was allocated funding through the Climate Change Preparedness in the North program to support field work to build on an aerial photo library of landscape change features, associated with a tasseled cap product.</p> <p>In the first year of this two-year funded project, the aerial photo helicopter survey was completed in the Fort Simpson region to add to the photo library in order to associate and calibrate on-the-ground land cover types with tasseled cap features.</p> <p>FMD was allocated additional funding to generate a multisource vegetation inventory (MVI) for the NWT to supplement the Northern Forestry Centre of the Canadian Forest Service inventory. Detailed forest vegetation plots were established around Fort Simpson and an airborne remote sensing method called Light Detection and Ranging (LiDAR) was also flown in order to build models for the LiDAR data. FMD successfully completed the 2019/20 MVI field program, where all plots were completed. (This project supports Action Area 6.1.)</p>	<p>Initiated</p>



ACTION ITEMS	LEAD, PARTNERS	2019/20 PROGRESS TO DATE	STATUS
<p>7.8 - Public safety</p> <ul style="list-style-type: none"> <li>Update the NWT Hazard Identification Risk Assessment to better predict which hazards could occur more frequently or become more extreme in the future</li> </ul>	<p><b>MACA, ENR, SmartICE, ECCC, community governments, IGOs, GNWT, Academia</b></p>	<p>MACA was allocated funding through the Climate Change Preparedness in the North program to update the NWT Hazard Identification Risk Assessment, which was released in April 2014. The assessment included climate change impacts and local knowledge in providing an examination of the risks that pose the greatest threat to the people, property, environment and economy of the NWT. Planning and preparing for future emergencies requires updated risk information, including the consideration of climate change impacts, to ensure the GNWT emergency response system is prepared to respond to more frequent and severe events. The objective of this project is to update the NWT Hazard Identification Risk Assessment as a key document to guide emergency management programs across the territories over the next five years.</p> <p>A request for proposal was issued in March 2020, but due to COVID-19 priorities, the project had to be delayed to 2020/21.</p>	<p>Initiated</p>
<p>7.9 - Culture and heritage</p> <ul style="list-style-type: none"> <li>Conduct vulnerability mapping for heritage resources at risk of destruction from coastal erosion in the Beaufort Sea Region</li> </ul>	<p><b>ECE, Academia, IGOs</b></p>	<p>ECE was allocated funding through the Climate Change Preparedness in the North program to conduct a vulnerability assessment for cultural places in the Kugmallit Bay region of the Beaufort Sea Coast. The overall goal is to create accurate maps and spatial data of cultural places which will facilitate management planning by establishing the anticipated rate of destruction of cultural landscape features, to assist in prioritizing future mitigation efforts. In the first year of the two year project, coastal erosion rates were updated with high-resolution imagery, to extend the geographic scope of the efforts to other important Inuvialuit sites. Map-interview sessions were conducted with members of the community of Tuktoyaktuk. (This project supports Action Areas 7.1 and 8.10.)</p>	<p>Initiated</p>

ACTION ITEMS	LEAD, PARTNERS	2019/20 PROGRESS TO DATE	STATUS
7.10 - Community infrastructure <ul style="list-style-type: none"> <li>• Prioritize community infrastructure gaps to mitigate the impacts of climate change</li> </ul>	<b>MACA,</b> community governments	<p>MACA and INF were jointly allocated Climate Change Preparedness in the North program funding to obtain an assessment of current capacity of adfreeze piles supporting GNWT and community buildings. This is to respond to the possibility that the pile capacity may have decreased since building construction, due to warming permafrost as a result of climate change. Based on a building inventory provided by INF and MACA, the project is set to identify buildings that are likely to be founded on adfreeze piles. The inventory currently indicates if a building is founded on piles, but does not identify the pile type, i.e. adfreeze pile, rock socket pile, or driven pile. Some funding was spent on the geotechnical and structural assessment in 2019/20. (This project supports Action Area 8.11.)</p>	Initiated

**PART 2: AREAS FOR FUTURE COLLABORATION**  
**GOAL 3**

ACTION ITEMS	LEAD, PARTNERS	2019/20 PROGRESS TO DATE	STATUS
8.2 - Supporting regional priorities <ul style="list-style-type: none"> <li>• Support communities experiencing impacts through focused resilience and adaptation initiatives</li> </ul>	GNWT, IGOs	<p>Discussions with CIRNAC to identify funding to support regional and community resilience and adaptation initiatives over the long-term have been initiated and will continue to be pursued.</p>	Initiated
8.3 - Applying geohazard expertise <ul style="list-style-type: none"> <li>• Increase technical capacity for addressing climate change related geohazards in development applications and public and community infrastructure</li> </ul>	<b>Lands, ITI</b> (NTGS)	<p>The Department of Lands has developed a job description for a geotechnical advisor position, which would include responsibilities for contributing science based advice on the wide range of land management and administration issues dealt with within the department.</p> <p>The NTGS received funding through the Climate Change Preparedness in the North program for a Thermokarst Mapping Project. The funding will be used to increase NWT's climate change adaptation capacity, by extending the permafrost mapping technician position (located at Wilfrid Laurier University's Yellowknife research office) and to hire summer student mappers. (See Action Area 7.3 for further details.)</p>	Initiated

ACTION ITEMS	LEAD, PARTNERS	2019/20 PROGRESS TO DATE	STATUS
<p>8.4 - Permafrost research coordination and application</p> <ul style="list-style-type: none"> <li>Ensure permafrost research conducted by Canadian and international agencies is coordinated and communicated to inform NWT decision-making</li> </ul>	<p><b>ITI (NTGS)</b></p>	<p>The NTGS received funding through the Climate Change Preparedness in the North program for a Thermokarst Mapping Project, to develop, test and implement a mapping framework to produce thermokarst and terrain sensitivity maps for (1) areas around each of the NWT communities; and then (2) to produce maps covering all of the NWT. The funding will be used to increase NWT's climate change adaptation capacity, in coordination with Wilfrid Laurier University. (See Action Area 7.3 for further details.)</p>	<p>Initiated</p>
<p>8.5 - Implementing wildlife plans / strategies (key species, species at risk, invasive species)</p> <ul style="list-style-type: none"> <li>Plan for the enhanced resiliency of wildlife by understanding climate change impacts and stressors on mitigation measures</li> </ul>	<p><b>ENR, ECCC, Resource Management Boards, IGOs, Industry, NGOs</b></p>	<p>ENR's Wildlife Division was allocated funding through the Climate Change Preparedness in the North program to support the development of an overall Climate Change Adaptation Plan for Wildlife in the NWT in full partnership with its co-management partners. In the first year of this two year project, a consultant was contracted to conduct interviews of the GNWT Inter-Departmental Species at Risk Committee members, the Conference of Management Authorities members, internal and external topic experts, target personnel from neighbouring jurisdictions, and other partners. The interviews aimed to collect information required to understand potential climate change impacts on NWT wildlife.</p>	<p>Initiated</p>
<p>8.7 - Increasing local food security</p> <ul style="list-style-type: none"> <li>Building on the priorities to be identified in a sustainable livelihoods action plan, work collaboratively with partners to identify and secure funding to support projects</li> <li>Invest strategically in food production opportunities that address climate change risk mitigation through the implementation of the NWT Agriculture Strategy and Canadian Agriculture Partnership between the GNWT and the federal government.</li> </ul>	<p><b>ENR, ITI, HSS, EIA, IGOs, community governments, academia</b></p>	<p>ENR continues to work with partners to support programs that advance food security for individuals, families and communities, as identified in the Sustainable Livelihoods Action Plan 2019-2023.</p> <p>In 2019/20, ENR: 1) provided funds to community research and on-the-land programs; 2) provided funding and administrative support to the NWT On the Land Collaborative, which provides a one window approach for land-based funding, including many projects that have food security elements; 3) the University of Waterloo (in partnership with multiple NWT-based IGOs, universities and others) successfully applied to to the Canadian Institutes of Health Research to undertake a collaborative four year research project focused on the intersection of Indigenous health and wellness, climate change and food security.</p>	<p>Initiated</p>

ACTION ITEMS	LEAD, PARTNERS	2019/20 PROGRESS TO DATE	STATUS
<p>8.9 - Community hazard mapping</p> <ul style="list-style-type: none"> <li>Develop outstanding components of the hazard mapping program, including permafrost, flooding, wildland fire, erosion and other climate-related impacts.</li> </ul>	<p>ENR, MACA, Lands, ITI, NWTAC, community governments, academia</p>	<p>The NTGS received funding through the Climate Change Preparedness in the North program for a Thermokarst Mapping project, to develop, test and implement a mapping framework to produce thermokarst and terrain sensitivity maps. (See Action Area 7.3 for further details.)</p> <p>In addition, ENR's Climate Change and Air Quality Unit, in partnership with the NWT Centre for Geomatics, tasks/acquires interferometric synthetic-aperture radar (InSAR) data for 52 target areas in the NWT, to be used to track ground movement over time. All target areas were tasked in 2019/20, including communities and other areas of interest, such as the Inuvik to Tuktoyaktuk Highway, mines, and hydroelectric facilities.</p>	<p>Initiated</p>
<p>8.10 - Protecting threatened heritage resources</p> <ul style="list-style-type: none"> <li>Conduct detailed studies/ excavations of significant heritage resources at threat of destruction from climate-driven processes</li> <li>Develop remote sensing based monitoring protocols for heritage resources at risk of impact</li> </ul>	<p>ECE, academia, IGOs</p>	<p>ECE was allocated funding through the Climate Change Preparedness in the North program to conduct a vulnerability assessment for cultural places in the Kugmallit Bay region of the Beaufort Sea Coast. This project included updating coastal erosion rates with high-resolution imagery, to extend the geographic scope of the efforts to other important Inuvialuit sites. (See Action Area 7.9 for further details.)</p> <p>In addition, ECE received funding from the Canadian Mountain Network to mitigate impacts of climate change on mountain caribou fences and alpine.</p>	<p>Initiated</p>

ACTION ITEMS	LEAD, PARTNERS	2019/20 PROGRESS TO DATE	STATUS
<p>8.11 - Upgrading public and community infrastructure</p> <ul style="list-style-type: none"> <li>Development of a collaborative GNWT and Yukon Government climate research network using existing and additional monitoring instrumentation and coordinating new research and development projects along the Inuvik-Tuktoyaktuk and Dempster highways</li> <li>Undertake improvements, as needed, to respond to specific climate change related impacts to infrastructure</li> </ul>	<p><b>INF, Yukon Government, community governments, MACA</b></p>	<p>INF was allocated funding through the Climate Change Preparedness in the North program to undertake an Aerial Light Detection and Ranging (LiDAR) survey of a 2 km wide corridor of the Dempster Highway from Inuvik to the NWT/Yukon border. This project will improve the monitoring of geohazards along the Dempster Highway, including thaw slumps, to assist the department in prioritizing and optimizing the operations and maintenance priorities on the highway. The LiDAR survey for the Inuvik to McPherson Dempster Highway Corridor was successfully covered with the allocated funding.</p> <p>MACA and INF were jointly allocated additional Climate Change Preparedness in the North program funding to obtain an assessment of current capacity of adfreeze piles supporting GNWT and community buildings. The project is set to identify buildings that are likely to be founded on adfreeze piles. The inventory currently indicates if a building is founded on piles, but does not identify the pile type. Some funding was spent on the geotechnical and structural assessment in 2019/20. (See Action Area 7.10 for further details.)</p>	<p>Initiated</p>

## PART 2: AREAS FOR FUTURE COLLABORATION CROSS-CUTTING: LEADERSHIP, COMMUNICATION AND CAPACITY-BUILDING

ACTION ITEMS	LEAD, PARTNERS	2019/20 PROGRESS TO DATE	STATUS
<p>9.2 - Training for Indigenous governments and organizations to support climate change monitoring</p> <ul style="list-style-type: none"> <li>Support Indigenous Guardians Programs led by Indigenous governments in the NWT to monitor climate change using traditional, local and scientific knowledge where requested</li> </ul>	<p>IGOs, ENR, federal departments</p>	<p>ENR is working with IGOs to support and/or implement guardian initiatives that are included in the establishment agreements for territorial protected areas. The GNWT and IGOs received four years of funding in 2019/20 under the Nature Fund Challenge to support the establishment and management of three territorial protected areas. The funding is supporting training, positions and on-the-land camps to build the local guardians programs for Ts'udé Niljné Tuyeta, Thaidene Nënë and Dìnàgà Wek'èhodi. Protected areas established under the <i>Protected Areas Act</i> require management plans which must include climate change adaptation and mitigation considerations. The management plan is also anticipated to include further details on guardian stewardship programming. ENR will build off existing guardians programs to conduct monitoring in territorial protected areas which specifically includes climate change considerations going forward.</p> <p>The Sustainable Livelihoods Action Plan 2019-2023 identifies ENR's support role for community-led guardian programs, which includes efforts to identify capacity and resources.</p>	<p>Initiated</p>

## PART 2: AREAS FOR FUTURE COLLABORATION

### CROSS-CUTTING: ECONOMIC IMPACTS AND OPPORTUNITIES

ACTION ITEMS	LEAD, PARTNERS	2019/20 PROGRESS TO DATE	STATUS
<p>10.1 - Undertaking sectoral assessments and adaptation planning</p> <ul style="list-style-type: none"> <li>• Scope key sectors including, but not limited to, transportation, ice roads, mining, agriculture, forestry, tourism and fisheries to determine economic impacts and opportunities</li> <li>• Explore opportunities to collaborate with think-tanks, academics and international stakeholders regarding the costs and benefits of climate-related changes in the NWT</li> </ul>	<p>ENR, ITI, industry, NGOs</p>	<p>Project planning for a winter roads project, specifically looking at climate change projections of NWT winter roads and socioeconomic community impacts of reduced winter road access, began in April 2020 (just after this reporting year), however it stemmed in part from community meetings in the Beaufort Delta held in March 2020 .</p> <p>ENR engaged in discussions with the Canadian Institute for Climate Choices to discuss work they are undertaking on the costs of climate change across Canada, including a focus on the North.</p>	<p>Initiated</p>

