Nechako IRC NEWSLETTER

March 2024 | Volume 6 Issue 1

NSERC/Rio Tinto Industrial Research Chair

"To better understand and quantify the roles of climate variability, climate change, and water management on the long-term water security of the Nechako Watershed."

RioTinto | BC Works 70 years

UNBC

NSERC CRSNG

Territorial Acknowledgement

Working on traditional First Nations territories in a scientific context is a humbling and deeply appreciated privilege. The opportunity to work hand-in-hand with Indigenous communities is a gift for which we are sincerely grateful. This collaboration not only enriches scientific understanding but also fosters mutual respect and cultural exchange. We are grateful for the trust and partnership extended to us, and we strive to approach this work with the utmost gratitude and responsibility. We acknowledge that our work takes place within the unceded traditional lands of 15 First Nations:

- Binche Whut'en
- Cheslatta Carrier Nation
- Lake Babine Nation
- Lheildli T'enneh
- Nadleh-Whut'en
- Nak'azdli Whut'en
- Nee-Tahi-Buhn Indian Band
- Saik'uz
- Skin Tyee Band
- Stellat'en
- Takla Lake
- Tl'azt'en
- Ts'il Kaz Koh (Burns Lake) Band
- Wet'suwet'en First Nation
- Yekooche First Nation

Netja koh (Nechako River) at Cottonwood Island Nature Park in Prince George

The Nechako River is referred to as **Netja koh**, meaning **'Big River'** in the traditional language of the Dakelh nations

CONTENT

In this issue of the Nechako IRC newsletter you will find updates from the current team of researchers. We continue to make progress on many fronts, including preparations for the upcoming summer field season.

Happy Spring Equinox!

An introduction from the project leader

Ness Lake, 18 February 2024

The winter 2024 semester is in its final weeks as yet another academic year comes to a close at UNBC. Once again, the climate in northern BC including the Nechako Watershed was exceptionally dry and, on occasion, even spring-like! Indeed, bouts of snowfall in November were followed by mild conditions in December, and a similar pattern unfolded in January when several decent snowfalls were followed by a very mild spell at the end of January. The relatively warm, dry spell continued in February but a few more snowfalls maintained an appreciable snowpack in the area.

In this issue of the Nechako IRC Newsletter Research Skills Trainee Tamar Richards-Thomas reviews the record-breaking winter thaw experienced in Prince George last January. As well in this issue, MSc student Justin Kokoszka explores the Nechako River's abrupt and gradual changes from 1956 to 2021 and relations to hydroclimate variability and water management. PhD candidate Bruno Sobral provides an update on his thesis research that focuses on atmospheric rivers affecting the Nechako Watershed. Research Skills Trainee Dylan Broeke and Justin Kokoszka provide an update on plans and preparations for the 2024 summer field season including the deployment of two new weather stations at Quesnel and Nulki lakes. As well, Research Skills Trainee Kirsten Calder-Sutt and Justin Kokoszka provide an overview of the quality assurance and quality control (QA/QC) of our observational data, a critical step before we share our data with research partners, stakeholders and end-users.

This winter, we welcomed Mostafa Khorsandi as a Research Associate. He joins us as he completes his doctoral studies at the Institut National de Recherche Scientifique (INRS) in Quebec City on a project focusing on Nechako River water temperatures. As well, we have recruited three new UNBC undergraduate students (Kainen Parmar, Lynn Poeppelmann and Maria Tavares) who will be part of our field crew this spring and summer under the leadership of Dylan Broeke. There are also other changes to team members. Bruno Sobral has left his position of Research Manager for the group as he focuses on completing his doctoral dissertation. The role of Research Manager is now filled jointly by MSc student Justin Kokoszka and former MSc student and now

IRC team member Lisa Rickard. Research Associate Kirsten Calder-Sutt has also transitioned to part-time employment and continues to support the development and operation of the MECHE observatory. You will read in this issue short biographies for Mostafa and Lisa, while the June issue will introduce our new field technicians.

The IRC team continues to emphasize outreach with the broader community to share the findings of our research. This winter, I conducted a couple of interviews with CKPG News to discuss the unusual climatic conditions observed in northern BC this winter. I also participated in a meeting of the Nechako Valley Working Group on January 8th and March 4th to discuss, among other topics, efforts to improve meteorological monitoring in the Vanderhoof agricultural belt. I also had the distinct pleasure of presenting a progress update on the IRC program of research to four Rio Tinto representatives who visited the UNBC campus on January 16th.

As reported in the last issue of the Nechako IRC Newsletter, the position of NSERC / Rio Tinto Industrial Research Chair on climate change and water security is now in its final year of operation. While the original date of completion was June 30th, 2024, UNBC has applied to NSERC for a one-year, no cost extension of the IRC program of research. As the COVID-19 global pandemic led to significant delays in some aspects of our research, a one-year extension would allow the completion of several projects including the water temperature analysis and modeling project led by MSc student Meng Wang and Research Associate Mostafa Khorsandi. Aside from the IRC program of research, several new projects funded by NSERC and NEEF, will ensure our team's continued presence across the Nechako Watershed in the coming years. For instance, this issue includes a short summary of a new NSERC Alliance project that is gearing up this summer, an effort led by Dr. André St-Hilaire at INRS.

Stephen Déry

Stephen Déry

"On behalf of the entire IRC team at UNBC, we thank members of the community for their continued support of our research and field activities. By mid-May, our team will be criss-crossing the Nechako Watershed as we return to collect valuable data at our nearly 50 field sites. We look forward to seeing you during our travels across the Nechako Watershed, and in the meantime, wish you a very pleasant spring season!"

The Team

Industrial Research Chair members from the NHG

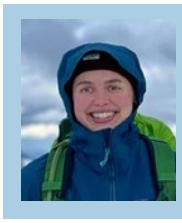
Dock Point weather station, 12 October 2023

Stephen Déry

Project Leader

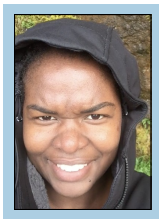
Justin Kokoszka

Research Manager
M.Sc. Candidate



Kirsten Calder-Sutt

Database Administrator



Tamar Richards-Thomas

Research Skills Trainee

Dylan Broeke

Field Crew Team Leader

Bruno Sobral

Ph.D. Candidate

Meng Wang

M.Sc. Candidate

New Team Members

We welcome two new Research Associates to the IRC team

A research life around Nechako Watershed

I have had a relationship with nature throughout my life, including my academic background. After studying and working in the field of hydrology, I completed my Ph.D. studies in Canada, Quebec, at the “Institut national de la recherche scientifique.” Since 2019, my focus has been on the Nechako watershed. This project was a collaboration between academia and Rio Tinto, the industrial partner of this project. My research involves hydrological modeling and the analysis of water temperature in the Nechako watershed, considering the impacts of upstream flow regulations via Skins Lake Spillway combined with climate change effects. With the support of awesome supervisors and numerous individuals, we have demonstrated the potential impacts of flow control and climate change on salmonid species, including Sockeye Salmon. This culminated in scientific recommendations for stakeholders in the Nechako watershed. It has been a pleasure and supremely delightful to serve nature, the First Nations, and the welfare of people through this research.

I joined the UNBC community and IRC as a research associate to contribute to water temperature modeling in this crucial watershed. This investigation enhances our understanding of individual streams and contributes to a holistic comprehension of the Nechako Social-Hydrological system. Join me in this scientific odyssey, where every measurement and modeling effort brings us closer to a profound understanding of the Nechako watershed's vital role in our environment and, hopefully, facilitates better future decisions to preserve the habitat of multiple species and lives in this watershed.

Mostafa Khorsandi

Lisa Rickard

Hi everyone, I’m Lisa and I live in Fredericton, NB, on the unceded and unsurrendered territory of the Wolastoqiyik. I graduated with an MSc from UNBC in 2023, and my thesis focused on identifying and comparing the sequence of events that led to major spring floods in the Wolastoq (Saint John) River Basin. Since graduating, I’ve continued working for UNBC remotely from Fredericton, preparing a paper for publication and also contributing to the Nechako Portal. I’m excited to join the IRC team and get started on my next research project, which will look at the impacts of land cover changes on the hydrology of the Nechako Watershed. Outside of work, I enjoy spending my time running around after my one-year-old daughter, Lily.

Research Chair Update

Results on the Water Budget for the Nechako Reservoir

In this issue of the Nechako IRC Newsletter, I present further results on the water budget for the Nechako Reservoir. Through the principle of mass or water conservation, all inputs to the Nechako Reservoir must equal all outputs plus any changes in volume or storage. Using a combination of observational and reanalysis hydroclimate datasets, we can compute all daily inflows to and outflows from the reservoir, as well as net precipitation that represents the difference between daily precipitation onto, and evaporation from, the reservoir. This analysis has been performed over a period for which sufficient data are readily available, namely from 1955 to 2021.

In the December 2023 issue of the Nechako IRC Newsletter, results were presented for the mean daily values for each principal term in the water budget, representing how those terms evolve on average during the calendar year. Here, a similar exercise is undertaken for two 32-year periods: 1) an "early" period covering 1956-1987, and 2) a "late" period spanning 1988-2021. Then, differences between the early and late period values (i.e. 1988-2021 minus 1956-1987 daily means) are computed to assess how daily values in net precipitation, inflows, outflows and storage have changed between the early to the late period (Figure 1).

Inspecting Figure 1, we first observe that the net precipitation (**blue curve**) onto the reservoir has not changed considerably between the early and late periods. In other words, there are generally as many positive and negative values scattered throughout the year in response to the random nature of precipitation events. Of note, however, are the many days when differences in net precipitation are negative in late summer and early fall, due to a combination of reduced precipitation and enhanced evaporation from the reservoir.

In contrast, changes in inflows (**black curve**) to the Nechako Reservoir exhibit strong seasonality, with large positive values from March through May and negative values from June to October. The positive values in spring are associated with earlier snowmelts during 1988-2021, with the spring freshets advancing to earlier dates in the year. In turn, this leads to an earlier recession to summer low flows that persist well into the fall, as identified by the negative inflow values. Changes in inflows between the early and late periods remain minimal during winter when baseflows becomes dominant. Overall, inflows have decreased on average by 6 $m^3 s^{-1}$ each day between the early to the late period.

Outflows (**red curve**) also show robust seasonal changes from the early to the late periods. Increases in 1988-2021 are evident during the Summer Temperature Management Program (STMP), which was implemented during the 1980s to cool water temperatures on the main stem Nechako River from mid-July to mid-August. Following the STMP, negative changes in outflows are observed until November. This is associated with an increase in storage (positive values) as inflows are retained in the Nechako Reservoir for use later in the water year. Outflows have decreased on average by 3.2 m^3 s^{-1} each day in the late period relative to the early period.

Finally, the changes in daily storage (**orange curve**) reflects the sum of all other water budget terms. In spring, changes from the early to the late period are generally positive in association with the advancing spring freshet. Changes in storage then flip to negative values as the summer recession flows also advance in time and then persist with the increased outflows during the STMP. Differences in storage return to positive values after the STMP due to reduced outflows at the Skins Lake Spillway and the Kemano Powerhouse. Overall, there is a net daily mean decrease of 2.9 m^3 s^{-1} in storage from the early to the late period.

Patterns observed in Figure 1 for differences in net precipitation and inflows from the early to the late period mainly reflect a response to climate change. As air temperatures have warmed by nearly 2°C in the upper Nechako Watershed since the 1950s, less precipitation falls as snow, surface waters warm and evaporate more readily, and the spring freshet advances leading to an extended period of summer low flows. As a consequence of the diminished inflows, the total outflows have also decreased during 1988-2021. Changes in water management, particularly during the STMP, is the main cause for alterations in the seasonality of outflows. In future issues of the Nechako IRC Newsletter, we will explore further trends in water budget terms in response to climate change and changes in water management in the upper Nechako Watershed.

Stephen Déry

"As air temperatures have warmed by nearly 2°C in the upper Nechako Watershed since the 1950s, less precipitation falls as snow, surface waters warm and evaporate more readily, and the spring freshet advances leading to an extended period of summer low flows."

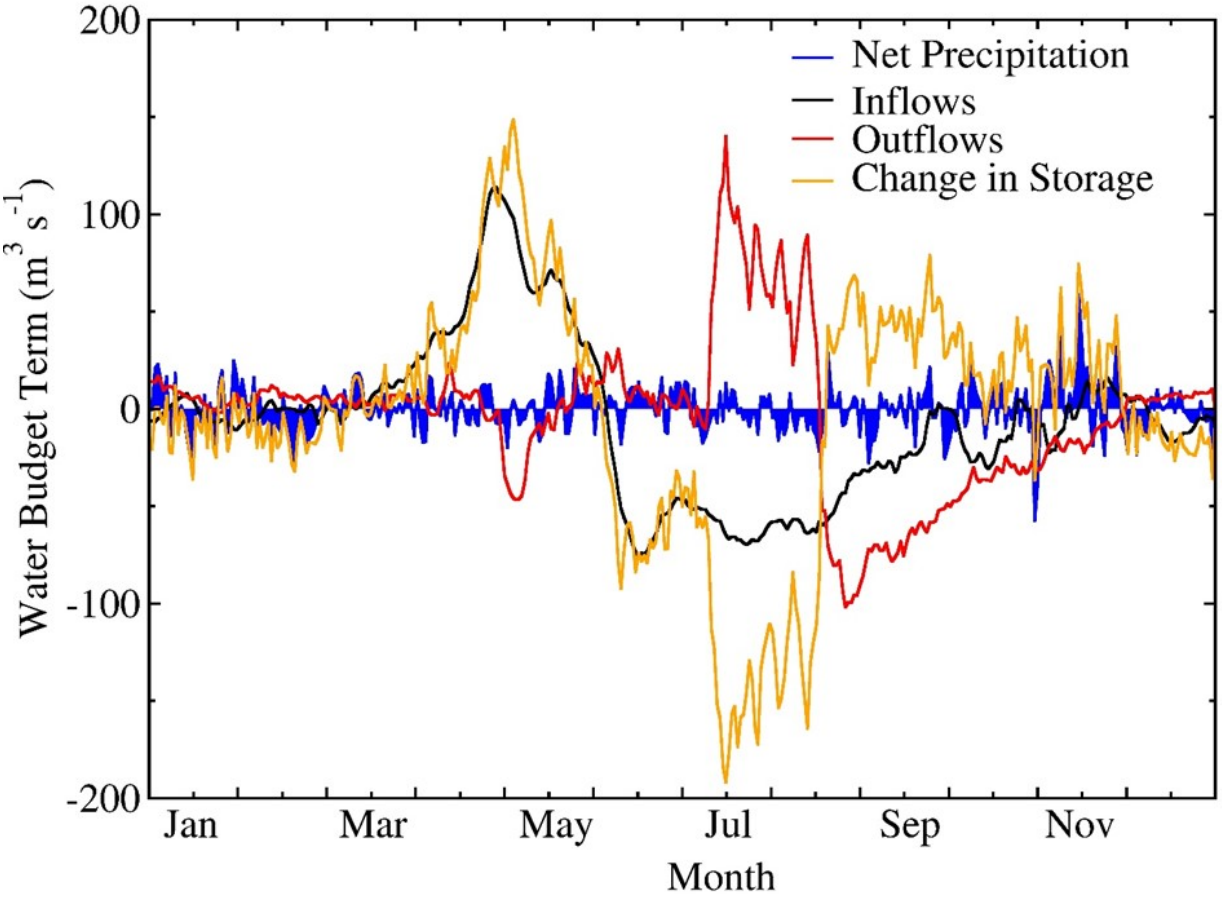


Figure 1: Differences in mean daily water budget terms (in units of cubic metres per second, $m^3 s^{-1}$) for the Nechako Reservoir between the early (1956-1987) and late (1988-2021) periods. Positive values in any quantity indicate that the water budget variable was higher in the late period relative to early period on that given day. Conversely, negative values of the water budget variables mean it was less during the late period relative to the early period on that given day.

NSERC Alliance

New project on thermal refugia in the Nechako River

We are pleased to announce that members of UNBC's Northern Hydrometeorology Group are now involved in a new project titled "Ecohydrology of a managed river system: Improved hydrological, thermal and fish habitat monitoring and modelling for informed management decisions." This 4-year project involves a group of six researchers from four universities and research institutions (UNBC, UBC, INRS, and ETS) who are partnering with Rio Tinto and Cheslatta Carrier Nation to explore, among other topics, thermal refugia in the Nechako River. The $3 million project is funded by Rio Tinto and the Natural Sciences and Engineering Research Council of Canada (NSERC) through their Alliance funding program with additional support from Cheslatta Carrier Nation.

Project Scope. The study area for this project is the Nechako Watershed that is partially managed by Rio Tinto for hydropower generation in support of its BC Works operations in Kitimat, BC. This watershed is undergoing rapid climate change with impacts to its regional weather, hydrology, and temperature, all of which are variables that affect fish habitat. With the recent expansion of Rio Tinto's operations in Kitimat and the growing demands for renewable sources of energy such as hydropower, there is an urgent need to better understand the possible impacts of flow management and climate change on fish habitat. This project will focus on two fish species of importance in the Nechako system: Chinook salmon and white sturgeon.

Project Objectives. The long-term objective of the project is to increase our capacity to protect key fish habitat in the system. To achieve this, we need to: 1) improve our monitoring of the main spring flow generation mechanism in the Nechako, which is snowmelt; 2) Improve tools that allow managers to forecast flows and water temperature in the system; and 3) Investigate when and where sturgeon and Chinook salmon use different habitats in the river system to remain in habitats that are adequate, both from a physical and physiological perspective. This includes water temperature, which is changing in the Nechako because of climate warming.

Communication Plan. We are in the process of consulting key stakeholders to seek their inputs on potential sampling locations. We will be reporting the results and findings of our research back to the community on a quarterly basis through a special section of future issues of the Nechako IRC Newsletter. Communities and individuals wishing to receive this newsletter can simply send a confirmation email to Stephen Déry (sdery@unbc.ca or irc@unbc.ca). Fieldwork plans (i.e. timing and location) will be discussed with stakeholders regularly. Results will also be disseminated via an annual newsletter that will be sent to interested individuals. Finally all of the data acquired during this project will be made available upon request. Water temperature data will also be publicly available via the RivTemp database (www.rivtemp.ca).

"The long-term objective of the project is to increase our capacity to protect key fish habitat in the system."

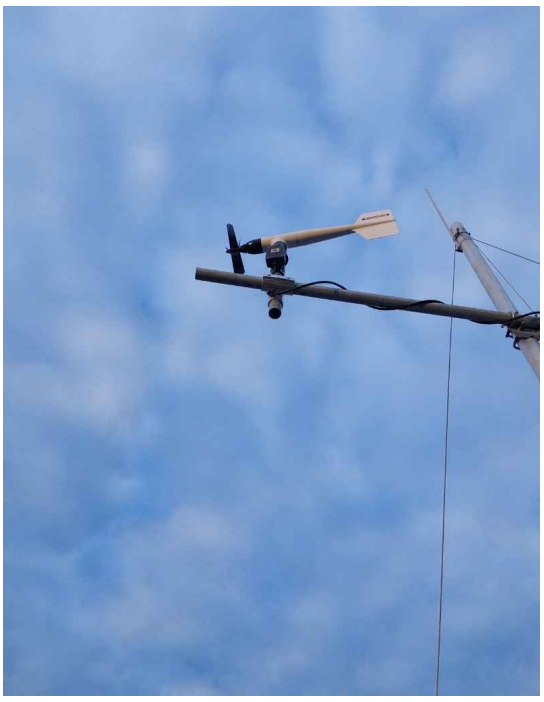
Stephen Déry

Data Management

Data compilation and quality control

As we have transitioned into 2024, my work with the NHG too has evolved. I am now working remotely with the NHG on a part-time basis, focusing my efforts on data management activities. Our group made significant progress this past year on the data management front, led by Justin Kokoszka. Our brand new equipment inventory program, site visit documentation protocol, and use of Fastfield forms have been revolutionary for the team. As we continue to move towards establishing a comprehensive system of standard operating procedures, I am working with Justin to explore options and refine quality assurance and quality control (QAQC) processes for our team. In the coming weeks and months, I will perform QAQC on all of our data to date, populate our up-and-coming database, and continue to be involved with MECHE data management. I hope these efforts will continue to streamline our team's work, establish consistent data management routines, and ensure high quality NHG data.

Kirsten Calder-Sutt



Terrace weather station, 1 November 2023

Field Work

Preparing for the upcoming field season

Projects and Preparations

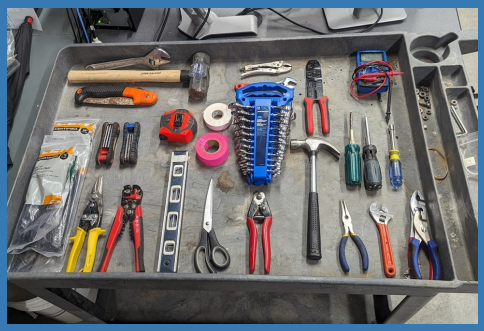
Since the last newsletter, lots of new projects have been developed and prepared in the field section of the NHG. Justin and I have been working together on creating manuals and training documents so the new 2024 field crew has a complete training program they can work through to answer any questions and prepare them for the field. The main manuals will contain information and links to every possible field-related task. With this resource, the two-week training period at the start of May will become much easier.

New Team Members

Three new members have been added to the NHG for the field crew for the 2024 season. We welcome Maria Tavares, Lynn Poeppelmann, and Kainen Parmar to the team who will be starting April 29th, 2024. Each of these new hires are fantastic people and will be an incredible asset to the team. These members are the first to work through the new training programs, so we are excited to help them through the process.

Field Season

This field season will be incredibly busy with 4 new weather stations being built, 36 stream temperature loggers to visit, 4 salmon spawning gravel bed loggers to dig out, 13 weather stations to visit, and 4 tipping bucket rain gauges to visit. With all these sites to collect data, perform needed maintenance and troubleshooting, and build, it is too much to ask one team to complete in the 4-month period. As such, we will be splitting into two groups with our four members and with our two work trucks. Each week we will be heading in opposite directions or working together on trips with much to do. With two teams comes the need for twice the tools. Pictured left, are some of the tools we use frequently in the field that I am organizing to build the needed tool kits for this summer. I am looking forward to the 2024 field season!



Dylan Broeke

Nechako Research

Explore some of our research!

16 - Streamflow trends

M.Sc. candidate, Justin Kokoszka, investigates the gradual and abrupt variations in both naturalized and regulated streamflow for the Nechako River at Vanderhoof.

Ph.D. candidate, Bruno Sobral, shares updates on his Ph.D. journey.

18 - Bruno's PhD Journey

19 - Prince George Weather

Research Skills Trainee, Tamar Richards-Thomas, explores record-breaking temperatures and drought conditions in Prince George.

Goose Point weather station, 12 October 2023

Nechako River Streamflow

Gradual and Abrupt Change for the Nechako River at Vanderhoof

Rivers are dynamic systems, and their flow patterns exhibit a complex interplay of gradual trends, abrupt changes, and cyclical variations. Gradual trends, like long-term increases or decreases, can be caused by factors such as climate change. Both human and climatic factors can lead to abrupt changes, such as dam construction or shifts in climatic regimes. These changes can disrupt aquatic ecosystems and impact water management practices. Cyclical variations, such as seasonal flow patterns, are essential for maintaining healthy river ecosystems, while multi-year wet/dry periods can become stressful factors for both humans and aquatic species. Thus, understanding streamflow variability is essential for understanding the effects of regulation and climate along the Nechako River.

Here we investigate the gradual and abrupt variations in both naturalized and regulated streamflow for the Nechako River at Vanderhoof between 1956 and 2021 (Figure 2). Our findings show that the regulated flows were 56% lower than that of the naturalized flow, in terms of an overall annual mean. Both flow records exhibited a downward trend with -1.26 cms/yr and -0.62 cms/yr for the naturalized and regulated flows, respectively (note: 1 cms equals one cubic metre of water per second). However, only the regulated trend was found to be statistically significant. Lastly, both flow records show a statistically significant change-point during 1977, coinciding with a well documented climate shift.

These findings suggest that regulation may be amplifying a natural decrease in streamflow at Vanderhoof. However, to fully understand these variations and the interplay between climate variability and water management practices, further investigation is needed. Moving forward we aim to investigate further the ways in which streamflow varies along the Nechako River and attempt to quantify any variations due to either regulation or climatic forces. This information is crucial for developing sustainable water management strategies for balancing human needs and the health of our river ecosystems.

Justin Kokoszka

"Our findings show that the regulated flows were 56% lower than that of the naturalized flow, in terms of an overall annual mean. Both flow records exhibited a downward trend with -1.26 cms/yr and -0.62 cms/yr for the naturalized and regulated flows, respectively."

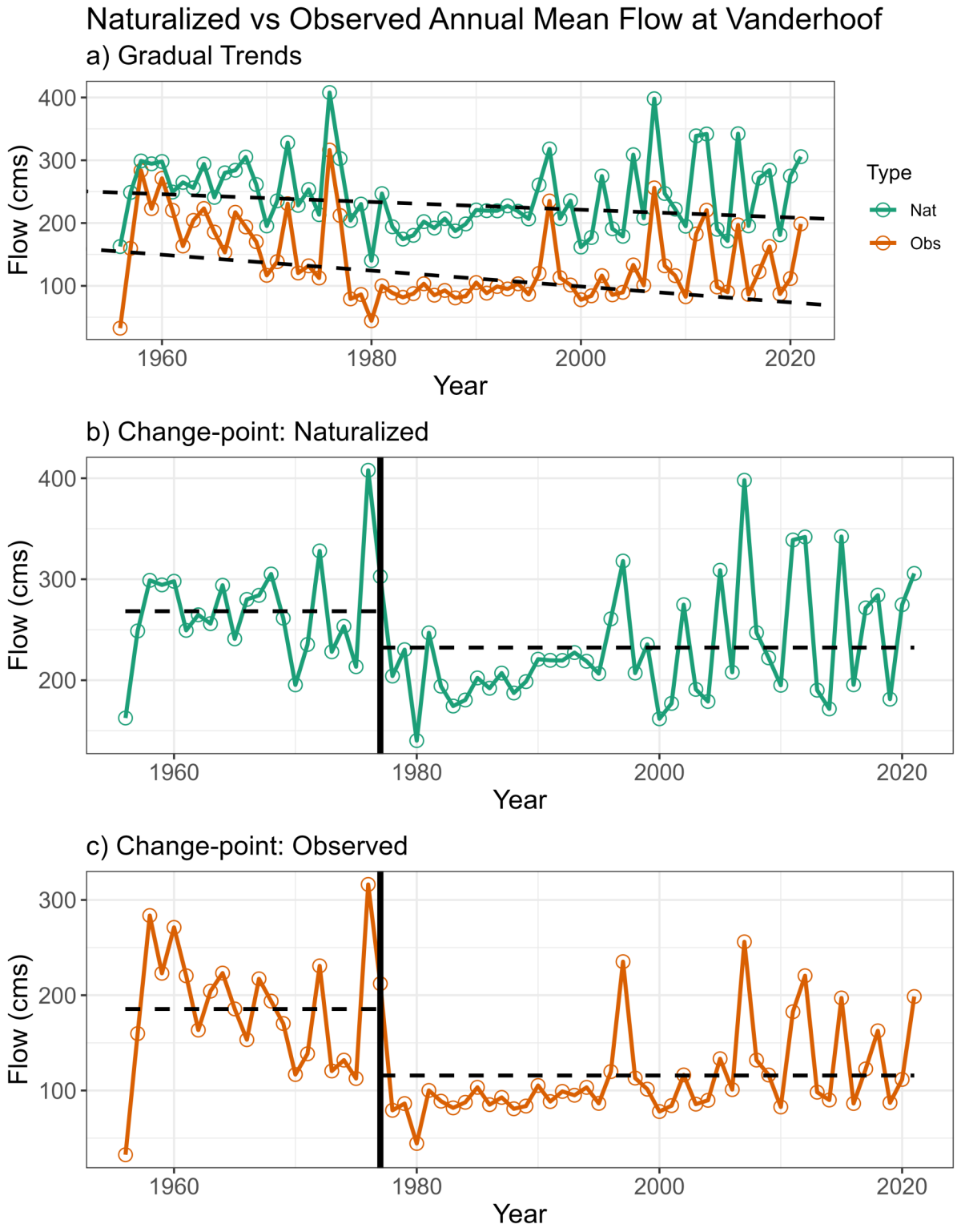


Figure 2: Annual mean streamflow (observed and naturalized) for the Nechako River at Vanderhoof between 1956 and 2021 (water years): a) long-term trends for both the naturalized (upper-dashed line) and observed (lower-dashed line) flow records, Change-point detection for the naturalized (b) and observed (c) records. The vertical lines indicate the year of abrupt change (1977), with the horizontal dashed lines indicate the mean flow for pre-1977 (left) and post-1977 (right).

An Update on my Research Plans for 2024

Dear All,

I hope this message finds you well. In this issue, I want to share updates on my PhD journey, especially as it took an unexpected turn recently. I have made the move back to Rio de Janeiro, Brazil, where I will be finishing my PhD studies remotely. I want to express my most sincere thanks to Dr. Stephen Déry and Rio Tinto for their support during my time at UNBC in Prince George. Living in Canada for over two years, working closely with NHGers, professors, and contributing to teaching activities was an amazing experience. I recently concluded my role as Research Manager with the NHG and have transitioned to part-time work with the Integrated Watershed Research Group (IWRG) of UNBC until April 2024. I am incredibly grateful for the valuable academic and professional experiences gained during my time at UNBC.

In terms of my research, over the past weeks I have been focusing on revising the manuscript for Chapter 3, which is titled the “Contributions of Atmospheric Rivers to the hydroclimatology of British Columbia's Nechako River Basin.” The revisions made improvements to the text with new interpretations of the results and a new figure with a polar plot was added. We have recently submitted it to the special issue of Hydrological Processes dedicated to the 2023 Congress of the Canadian Geophysical Union. The initial results were presented during the event, and the manuscript is currently under review. We are hopeful for its publication in the upcoming special issue of Hydrological Processes.

Currently, I am preparing for the Canadian Meteorological and Oceanographic Society (CMOS) 58th Congress (CMOS 2024), where I plan to present preliminary results from Chapter 4. This chapter will show the characteristics of three significant Atmospheric River events that impacted the Nechako River Basin in 1952, 1978 and 2009. Methodology, results, and visual aids are well underway, and will help in building the poster for the event in early June 2024. Presenting the preliminary results at CMOS will be a good opportunity to get science-based feedback on the development of Chapter 4. I will be meeting the PhD Committee, likely in late March, also hoping for guidance on the ongoing work for Chapter 4. Looking ahead, I am excited about defending my PhD dissertation next fall and continuing to collaborate with NHGers, IRCers, and UNBCers throughout this journey.

Bruno Sobral

Warm regards,

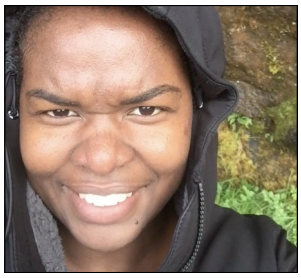
Bruno Sobral

“Currently, I am preparing for The Canadian Meteorological and Oceanographic Society (CMOS) 58th Congress (CMOS 2024), where I plan to present preliminary results from Chapter 4.”

Weather in Prince George

December 2023 Sees Double Record-Breaking Temperatures

The City of Prince George experienced double record-breaking air temperatures on 28 and 30 December 2023, according to the measured air temperatures provided by "Environment Canada" to "Environment and Climate Change Canada at Prince George Airport Auto station (Figure 3). The air temperature rose to a maximum of 8.7 °C and 9.7 °C on Thursday and Saturday, 28 and 30 December 2023, respectively. The maximum air temperatures recorded broke over a century (28 December 1919) and near a century (30 December 1926) record. Interestingly, these temperature recording-breaking days were not the hottest days recorded at Prince George (PG) station. PG recorded a maximum temperature of 12.8 °C on 22 December 1919.



Tamar Richards-Thomas

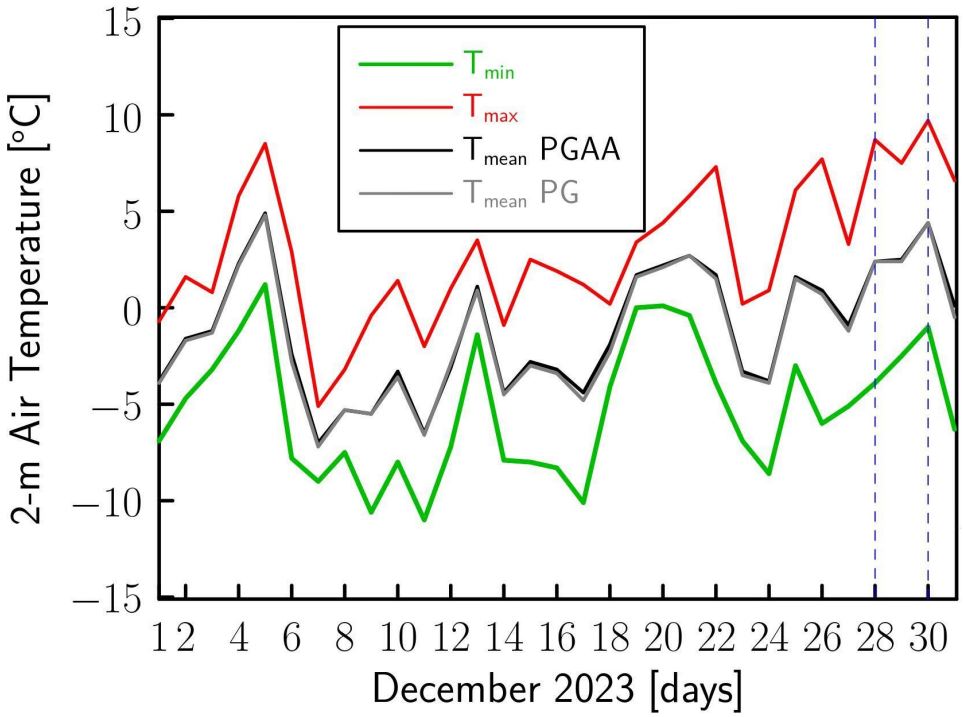
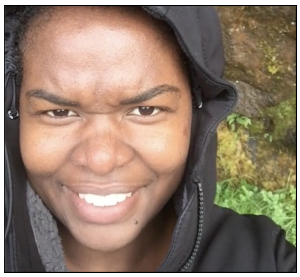


Figure 3: The daily max (T_{max}), min (T_{min}) and mean (T_{mean}) temperatures recorded at Prince George Airport Auto (PGAA) and Prince George (PG) in December 2023 with the dashed lines showing record-breaking air temperatures of 8.7 °C and 9.7 °C on 28 and 30 December 2023.

Weather in Prince George

Severe Drought Conditions Persist Across Prince George and Western Canada

The ongoing drought in Prince George (PG) has worsened in recent months. The cumulative precipitation continues to depart from average precipitation to reach almost a 400 mm deficit, about two-thirds of the average annual precipitation from 2022 to the present in PG (Figure 4). PG received only 350 mm of precipitation over the past year, insufficient to overturn or reverse the current continuous deficit. Surrounding areas such as Vanderhoof reported only about 211 mm of precipitation over the past year, challenging agricultural activity within this area. The lack of precipitation is attributed in part to climate change and to the recent El Niño. El Niño occurs when above-normal sea-surface (up to 20 m below the surface) temperatures are observed across the tropical Pacific Ocean, causing air temperatures to rise up to 4°C above normal across western Canada breaking several air temperature records. For instance, PG experienced double record-breaking air temperatures on 28 and 30 December 2023 (see related story on page 19). This curve (Figure 4) needs to trend upward for us to see any relief of the drought, although the coming months may not be promising. A continuous cumulative precipitation deficit can enhance potential for agricultural drought and wildfires of which >100 fires are still burning under thick layers of snow as the cloud and smell of white smoke linger in nearby communities such as Fort Nelson, which is currently experiencing severe drought (level 5).



Tamar Richards-Thomas

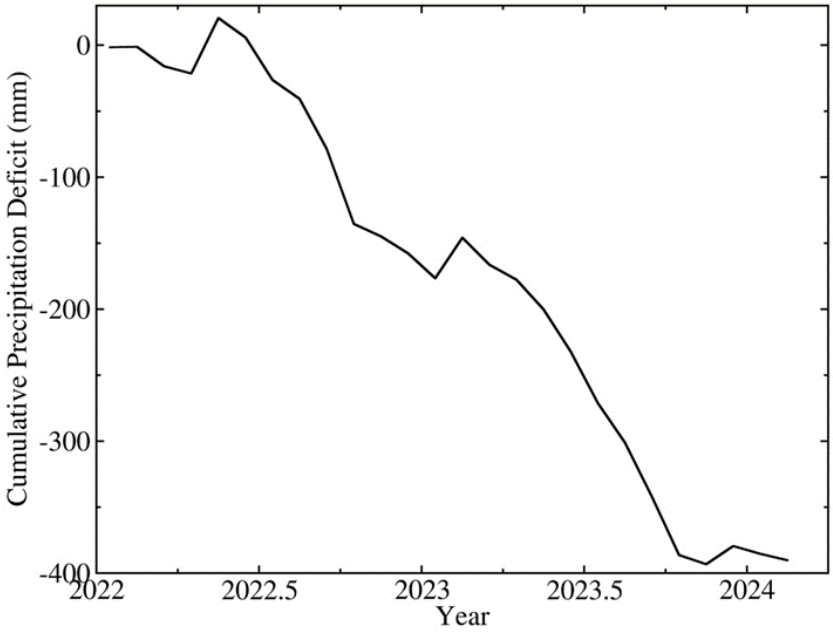


Figure 4: Monthly cumulative precipitation deficit relative to the 1981-2010 average conditions for the Environment and Climate Change Canada Prince George Auto station from January 2022 to February 2024.

Outreach

Communicating our findings through various means continues to be a top priority!

Presentations

Jan 16 Stephen delivered a presentation summarizing research progress since the inception of the NSERC / Rio Tinto Senior Industrial Research Chair in climate change and water security to representatives from Rio Tinto.

Feb 28 Stephen delivered a guest lecture in GEOG 310 – Hydrology focusing on atmospheric rivers including a description of the Tahtsa Ranges Atmospheric River Experiment (TRARE) held in the fall of 2021.

Meetings

Jan 8 Stephen participated in a meeting of the Nechako Valley Working Group.

Mar 4 Stephen participated in a meeting of the Nechako Valley Working Group.

Mar 6 Stephen participated in a meeting of the Technical Working Group of the Water Engagement Initiative.

Media Interviews

Jan 8 Impacts of the ongoing drought in northern BC on groundwater levels, CKPG News, CKPT (Prince George, BC).

Jan 29 Warm temperatures and rapid snowmelt in northern BC, CKPG News, CKPG (Prince George, BC)

Mar 19 Low river water levels in the Nechako River and the persistent drought in northern BC, Daybreak North, CBC Radio (Prince George, BC)

Check out our website! https://web.unbc.ca/~sdery/irc

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RioTinto | BC Works 70 years
UNBC
NSERC CRSNG