
Adaptation Stories in the Bow Basin

Storytelling for watershed resilience



Expression of Gratitude

I extend my deepest gratitude to my generous mentor, Mike Murray, whose expertise and guidance have been indispensable throughout this project and pivotal to my career development in watershed management. My heartfelt appreciation goes to the entire BRBC staff and volunteers, with special recognition to Brooke Kapeller, whose contributions were instrumental in shaping the Adaptation Stories in the Bow Basin project.

I am immensely thankful for the administrators of the ART internship program, Justis Allard Hagan and Shannon Heaney. Their support has made this experience overwhelmingly positive, and the lessons learned will resonate with me for a lifetime.

Lastly, I am honored to have engaged with esteemed water management experts, agricultural producers, and non profit leaders in the Bow Basin, who graciously dedicated their time to amplify the message of adaptation.

My heart overflows with love for the land and waters of the Bow Basin, which have nurtured me since childhood. Though these lands are new to my family, they have embraced us, gifting us with an newfound sense of home and purpose. My deepest hope is that this project will become a thread in the larger network of restoration within the Basin.

May the land, waters, and people continue to heal, connect and thrive. I extend my respect and reverence to the Blackfoot, Tsuut'ina First Nation, Stoney Nakoda, and Métis who hold profound, resilient and sacred relations with these lands.



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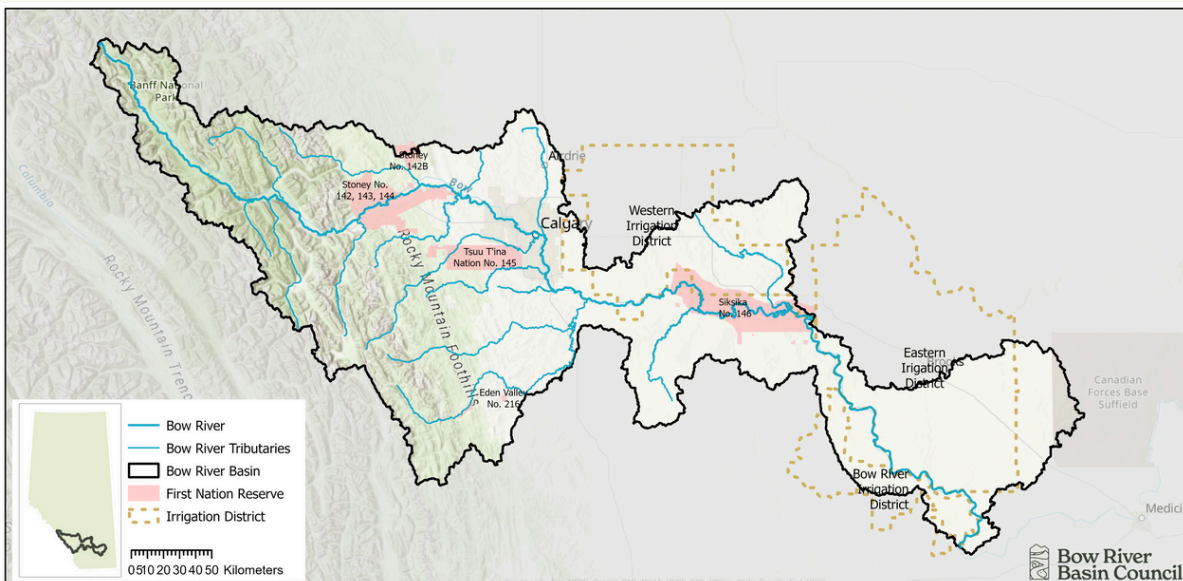
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Introduction

The Bow River originates from the Bow Glacier and Bow Lake in Banff National Park, traversing through the Bow Valley, Calgary, and the prairies before joining the Oldman River to form the South Saskatchewan River. With over 1.6 million people residing within its watershed, the Bow River Basin is vital, providing essential resources like drinking water, agricultural opportunities, and recreational havens while sustaining diverse ecosystems and wildlife populations. This basin holds historical significance as the traditional territory of several Indigenous peoples, including the Blackfoot Confederacy, Tsuut'ina First Nation, and the Stoney Nakoda, now governed under Treaty 7 and Metis Region 3. The Bow River Basin Council (BRBC) serves as a unifying force, comprising stakeholders from various sectors, committed to fostering dialogue, understanding, and action for a healthy watershed.



Climate change poses significant risks to the Bow River Basin, including heightened drought susceptibility, increased flooding events, wildfire threats, and ecological vulnerabilities. By acknowledging and addressing these risks collectively, the basin can enhance its resilience and preserve its ecological integrity and socio-economic well-being. In an effort to spotlight adaptation initiatives within the basin, I conducted qualitative interviews across sectors, weaving together insights to offer a comprehensive narrative of the region's response to environmental challenges, bridging science and storytelling.

Explore the [Adaptation Stories in the Bow Basin](#) project.

Urban Adaptation

The Bow River Basin faces unique challenges and opportunities due to its dense population, infrastructure, and essential services. Aging infrastructure and public health concerns necessitate proactive adaptation measures, including natural infrastructure and green stormwater management, to address issues like flooding, drought and water storage.

35 %

of Alberta's population lives in the Bow Basin

Primarily concentrated in the City of Calgary. Other significant urban centers in the basin include Canmore, Cochrane, Okotoks, Chestermere, and parts of Airdrie and Strathmore.

1/3

of Canada's infrastructure is in disrepair

Alarming, an estimated one-third of public infrastructure is deemed to be in a state of disrepair, necessitating urgent retrofitting or replacement, as emphasized by Warren and Lulham (2021).

A shift towards natural infrastructure solutions is evident following the 2013 southern Alberta floods, which exposed the vulnerabilities of traditional grey infrastructure.

2/3

of Canada's infrastructure is overseen by municipalities

Crucial infrastructure categories like roads, bridges, cultural amenities, recreational facilities, water and wastewater systems, waste management, and sometimes energy and communication utilities (Canadian Infrastructure Report Card, 2019).



Urban Stories

Urban adaptation is crucial for building resilience against changing environmental conditions and ensuring a sustainable future. Effective communication and collaboration among water management stakeholders are vital for sustainable water resource management. The initiatives were chosen to provide insights into diverse implementation approaches, with the aspiration of assisting others in their adaptation efforts.

Visit the [Urban Adaptation Story Map](#) to learn more.



Liliana Bozic
Senior Stormwater Engineer | Urban Systems

- reconstructed wetlands
- stormwater management
- water management



Anne Naumann
Program Manager | Calgary River Valleys

- riverbank rehabilitation
- restoration
- working with land owners & within different jurisdictions



Simone Lee
Programs & Events | Calgary River Valleys

- community collaboration
- volunteering
- education efforts



Harris Switzman
General Manager of Environment and Sustainability | Calgary Airport Authority

- runway drainage infrastructure
- storm ponds
- chemical contamination
- sustainability strategy



Rural Adaptation

In the Bow River Basin's rural areas, water serves diverse purposes including agriculture, industry, and domestic needs, with irrigation licenses crucial for sustaining many crops amidst dry summers. However, escalating climate-related risks like droughts highlight the vulnerability of rural communities, emphasizing the need for fair water access.



Beaver dam analogue in the Ghost Watershed. Courtesy of Trout Unlimited Canada

As climate change exacerbates droughts, floods, and wildfires, rural communities face heightened vulnerability. The rural landscape's sparse population and vast geography limit emergency response services and adaptation planning due to resource constraints and lack of expertise.

One resident shared on his self-implemented wildfire water system, highlighting individual efforts to build resilience.

Organizations like the [Ghost Watershed Alliance Society](#), [Trout Unlimited Canada](#), and the [Elbow River Watershed Partnership](#) collaborate with diverse user groups and land managers to find solutions for environmental challenges, such as managing sediment loading from off-road vehicles.

**Flora
Giesbrecht**

“What I've found through my work is that the river is a reflection of the landscape... water work brings out what is happening upslope.”

Rural Stories

As we delved into rural adaptation projects in the Bow River Basin, we connected with non profit leaders and landowners across the western part of the Basin. From agricultural innovations to community resilience efforts, we explore a range of initiatives aimed at strengthening rural resilience.

Visit the [Rural Adaptation Story Map](#).

Agriculture



Riparian protection
Rancher in Ghost Watershed



Regenerative agriculture
Rancher in Nose Creek Watershed

Beavers



Beaver Co-existence
Elbow River Watershed Partnership

Infrastructure



Bridge re-construction
Elbow River Watershed Partnership



Bioengineering
Ghost Watershed Alliance Society



Culvert replacement
Trout Unlimited Canada

Policy & Planning

Policies guide decisions while institutional changes provide essential support. These efforts, though often less visible, are crucial for enhancing resilience, safeguarding resources, and promoting sustainability in the face of climate change challenges. Water management in the Bow River Basin involves multiple jurisdictions, including the Albertan and Canadian governments, First Nations, municipalities, and irrigation districts, each responsible for water protection and management within their sphere of influence.

Land use authorities

- Cities (approx. 4%)
- Parks and Protected Areas (approx. 11%)
- Public Land Use Zones (approx. 8%)
- Government of Canada's National Park (approx. 13%),
- Municipal Districts and Counties (approx. 66%)
- First Nation Reserves (approx. 6%)

Land use & development

Mainly managed through a hierarchy of statutory planning tools. Municipal Development Plans (MDPs), Area Structure Plans (ASPs), Area Redevelopment Plans (ARPs), and land use bylaws form the backbone of this system. Regional plans are developed under the Alberta Land Stewardship Act (ALSA), holding the highest authority (Tyler, 2023)

Emergency planning

- Integrate emergency planning with climate risk assessments
- Effective risk management needs supportive policies, informed decisions, equitable resources, and transparent communication.
- Adequate resources and proactive planning foster climate resilience

Nationally, since at least 2008, federal and provincial government agencies, along with nongovernmental and local organizations, have promoted the development of municipal climate adaptation plans. Initially focused on mitigating GHG emissions, these plans have since expanded to address extreme weather impacts and broader social implications.



Policy & Planning Stories

In this story map, we delve into some of the legislative pathways for adaptation. Interviews within this story map shed light on strategies including watershed modeling for decision making, climate adaptation plans, and sustainability initiatives, while also touching upon emergency preparedness planning.

Read the [**Policy & Planning Story Map.**](#)

ENTITY	STRATEGY
WaterSMART	<ul style="list-style-type: none">• South Saskatchewan River Operational Model (SSROM), Adaptation Roadmap
MD of Bighorn	<ul style="list-style-type: none">• Climate Adaptation & Resilience Plan 2024
Calgary Airport Authority	<ul style="list-style-type: none">• Sustainability Strategy 2022-2026



Photo by [Ben den Engelsen](#) on [Unsplash](#).

Knowledge & Skills

Capacity building is essential for achieving climate resilience, as it equips professionals with the necessary skills to address climate change challenges effectively. Preparing students and professionals to lead resilience-building efforts ensures they can navigate the complexities of the Basin's landscape, strengthening our resilience against future adversities.

“I was brought to SAIT to chair the water sustainability portfolio... And I had a lot of support. But at the same time, there was a lot of learning on my end. I mean, there was no team. There were no students. There were no labs. There was no equipment.”

Dr. Pablo Pina

SAIT Chair of Sustainability

The Bow Basin, serving as an industrial and financial hub, faces significant climate vulnerabilities. Thus, cultivating a skilled workforce capable of managing climate adaptation is imperative. Strategic capacity-building initiatives aim to empower professionals with the knowledge and skills needed to safeguard the resilience of the Bow Basin and beyond.



Sustainability Sciences Analyst, SAIT

Michelle Anderson

“Right now we’re in the early, early, early, early adopter phase of urban farming. But with that comes a lot of opportunities.”

Knowledge & Skills Stories

In the final story map theme, we focus on the crucial role of capacity building in enhancing climate resilience. Interviews with professionals like Michelle Anderson and Pablo Pina of SAIT underscore the significance of institutional support in fostering new skill sets and contributing to a broader knowledge base around adaptation.

In the interviews for the other story map themes, it became clear that many organizations involved in adaptation also prioritize capacity building. For example, the Ghost Watershed Alliance Society began organizing bioengineering workshops over a decade ago to develop new skills among volunteers and partners. One volunteer was so inspired that he then pursued a restoration diploma and now leads these very workshops, exemplifying the lasting impact of these capacity-building efforts.

Read the [Knowledge & Skills Story Map](#).



Capacity building | Dr. Pablo Pina
SAIT Sustainability Programs & Research



Communications | Aidan Y.
Green Stormwater Story Map



Research | Michelle Anderson
Urban farming in Calgary

Recommendations

The BRBC aims to enhance watershed resilience by consolidating climate data and providing strategic recommendations, as outlined in the 2024 State of the Watershed (SOW) report. This report addresses changing weather patterns, streamflow dynamics, and glacial stability, using climate projections for planning and management. This section of the SOW offers strategies for climate adaptation and encourages further exploration in the BRBC's collection and dissemination of climate information.

BRBC Committees

- Create an adaptation standing committee or sub-committee
- Create an adaptation plan or strategy document OR hire a consultant to do so

Non-profits & academia

- Work to decrease knowledge gaps about adaptation strategies
- Enhance and restore riparian zones and wetlands

Municipal Government

- Invest in natural infrastructure
- Retrofit existing infrastructure
- Promote community engagement and education initiatives

Despite challenges like resource limitations and regulatory barriers, progress depends on collaboration, transparency, and increased funding. Cross-sector coordination is crucial as the BRB faces water scarcity and flood risks.

Read the [**SOW report**](#).

Conclusion

As we conclude our examination of climate resilience in the Bow River Basin, it is essential to recognize the multifaceted efforts required to address the complex challenges posed by climate change. Both urban and rural communities play pivotal roles in fostering resilience through innovative strategies and collaborative initiatives. This approach underscores the importance of integrating adaptation into planning and policy frameworks, while also highlighting the critical need for capacity building and sustained investment.

Urban adaptation strategies are crucial for addressing climate change in the Bow Basin, focusing on nature-based solutions and stormwater management to protect communities and critical infrastructure. Cities, as innovation hubs, can lead in climate resilience by integrating adaptation into planning and policies. Municipal experiences in the basin highlight the effectiveness of local actions in addressing climate challenges, promoting sustainability, equity, and community engagement. Ongoing collaboration and innovation are essential for urban sustainability, leveraging the co-benefits of adaptation strategies for public health, social cohesion, and economic stability.

Rural communities in the Bow River Basin have shown resilience through sustainable farming and coexistence projects, with partnerships enhancing success. Overcoming funding, regulatory, and knowledge challenges through continued collaboration and investment is vital for both urban and rural resilience.

Capacity building for professionals and organizations is key to navigating climate adaptation complexities. The Bow Basin, an industrial and financial hub, requires strategic efforts to build resilience against climate vulnerabilities, ensuring a sustainable future.



ART Experience

Thanks to the BRBC's collaborative ethos, networking opportunities were abundant throughout my internship, allowing me to engage with a vast and diverse group of water experts. From industry-specific forums to hands-on workshops, I had the chance to attend a wide array of events, each one fostering valuable connections and expanding my professional network. The variety of tasks I tackled further enriched my experience. From conducting comprehensive literature reviews to engaging in hands-on fieldwork, each task kept the work dynamic and engaging.

Despite the challenges, such as learning new skills like video and audio production and navigating the project's independent nature, I'm immensely proud of the growth and adaptability I've achieved. Managing the project presented a significant learning curve, but with the support of mentorship and through a process of trial and error, I successfully propelled the project forward. These experiences have not only equipped me with a distinct skill set but also instilled a sense of resilience and resourcefulness. I look forward to leveraging these valuable skills and insights in my upcoming pursuits, confident in the knowledge and experience I've gained.



Tenaya Lynx holding her audio/visual recording equipment with the Ghost River in the background. Courtesy of Sharlene Fritz.

References

Canadian Infrastructure Report Card. (2019). Monitoring the State of Canada's Core Public Infrastructure. canadainfrastructure.ca

Lulham, N., Warren, F.J., Walsh, K.A. and Szwarc, J. (2023). Canada in a Changing Climate: Synthesis Report; Government of Canada, Ottawa, Ontario. <https://changingclimate.ca/synthesis/>

Tyler, M. (2023, March). Alberta Municipalities: Climate Risk Assessment and Adaptation Considerations for Municipal Governance. Future of Municipal Government Series, 15(43), pp. 1-51. <https://doi.org/10.11575/sppp.v16i1.76064>



Constructing a beaver dam analogue. Courtesy of Trout Unlimited Canada

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