Adaptation planning: the local government experience in BC

SUMMARY

Communities across British Columbia are taking action on climate change. Many participated in the BC Regional Adaptation Collaborative (BC RAC, 2009-2012), an initiative designed to encourage integration of climate adaptation in strategic planning and decision-making. The BC RAC was co-led by Fraser Basin Council (FBC) and BC Ministry of Environment, with funding from Natural Resources Canada (NRCan), the BC Government, local governments and other key stakeholders.

This case study of the BC RAC explores the drivers of and barriers to local government action on climate change adaptation. Understanding these factors can help other communities in their efforts to increase their resilience to the impacts of climate change. The success factors and lessons learned in this case study were gathered through interviews and a real-time, moderated e-Dialogue forum with nineteen provincial, regional and local governments, as well as non-governmental actors. The participants in this case study remain anonymous throughout the document, represented by a number.

Factors that Helped Move Adaptation Planning Forward in BC

1. Integrating adaptation into existing planning processes was often the most effective approach for moving adaptation forward.
2. Immediate or recognizable impacts and threats generated public and political interest, and support for adaptation planning.
3. Decision support tools help local governments understand their options.
4. Leaders and champions were instrumental in mobilizing internal capacity.
5. Learning networks and researcher-practitioner linkages were effective at mobilizing awareness and interest at the community level.
6. Targeted funding enhanced collaboration and engagement.

Key Lessons Learned from the BC Case Study

1. Strategic allocation of funding can leverage existing momentum, resulting in greater success.
2. Concerns about legal liability can both aid and hinder adaptation planning.
3. Creative communication tools help to build awareness and momentum.
4. Collaboration and partnerships can increase awareness and mobilize support.

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OVERVIEW OF ADAPTATION ISSUE

British Columbia is an economically and geographically diverse province and, therefore, the impacts of and responses to climate change across the province will vary according to place. Communities in BC have taken different approaches to adaptation. Some communities pursued their own initiatives independently, while others partnered with external organizations as part of a broader initiative. For example, ICLEI Canada worked with many of the urban centres in the province and Columbia Basin Trust's (CBT) *Communities Adapting to Climate Change Initiative (CACCI)* facilitated adaptation processes for several rural BC communities in the southeast. Fraser Basin Council (FBC), through its partnership with Ministry of Environment and Natural Resources Canada (under BC RAC), provided support for the development of decision support tools and approaches on adaptation planning in BC communities.

Examining the varied experiences of communities in the province is key to understanding the drivers of adaptation and lessons learned that could be relevant to other communities taking action on climate change.

City of Kimberly Flooding, 2012

Source: Emergency Management BC

DRIVERS OF ACTION

Six factors helped move adaptation planning forward in BC. These factors are illustrated below using examples taken directly from the experience of BC communities.

Integrating adaptation into existing planning processes

Integrating adaptation into existing planning processes and using adaptation as a lens for considering short and long-term infrastructure and land-use planning was often the most effective approach for moving adaptation forward. This was executed in a number of ways by different local governments.

The revision of Official Community Plans (OCPs) or development of broader sustainability plans spurred thinking about how to integrate adaptation and mitigation and broader long-term planning in many communities. This was particularly relevant to infrastructure planning, including storm-water management [15], and land-use planning [2][4][5][7]. One interviewee noted how the integration of adaptation into the Official Community Plan allowed them to move forward on climate change adaptation and mitigation planning. The Bill 27 Green Communities Act mandates communities to integrate climate change targets into their OCP; this has helped communities think about climate change planning and adaptation.

> *"It was also the adoption of our OCP that had specific language around climate change adaptation and mitigation contained within it that gave us, as staff, the freedom to move forward with starting a more formal process of developing an adaptation strategy" [12].*

Climate adaptation frameworks developed by ICLEI and CBT and support from FBC (and enabled by the Province's Bill 27 Green Communities Act) helped local governments pursue adaptation planning more broadly [2][10]. Existing frameworks provide a foundation for champions to use, and give adaptation approaches legitimacy, and thus value, in local government contexts [9][12]. One interviewee noted:

> *"We were also embarking on a new Official Community Plan and we wanted climate resilience to be at the forefront. When ICLEI announced their new adaptation-planning framework, we thought it was timely and something we would be interested in pursuing" [3].*

Other regional and local governments seized opportunities to mainstream adaptation into their operational services [15][20]. For instance, the Capital Regional District is aiming to have "adaptation directly related to every decision" in the over 200 corporate services they provide. Staff reports will begin to standardize reporting to ensure projects account for projected climate impacts and energy use [15]. This internal leadership to mainstream both mitigation and adaptation into decision-making is motivated by the mandate for service continuity, the legal obligation to protect

millions of dollars of infrastructure from the threat of climate change, and a moral imperative to do the right thing.

For a number of communities, climate adaptation strategies naturally fit within risk assessment and management frameworks in local government [3][7][10][11][14]. In effect, climate change projections add an additional layer of complexity to existing natural hazard risk assessment and management [11][13].

Immediate or recognizable impacts and threats

Both experienced and projected climate impacts on the community were often drivers for action. Many regions across BC have experienced climate-related impacts. These impacts include more frequent storm events that result in hydrological issues such as flooding and drainage issues [9][4][13][11]; wildfire interface management [6][9]; pine beetle kill and its effects on flooding [6][12]; thermal expansion and contraction of road systems causing potholes [12]; landslides [3] and other hazards.

Pine Beetle Affected Forest

For example, the City of Surrey is experiencing more flooding and drainage issues along the coast, along with dry periods that have increased watering requirements for newly planted trees. A severe landslide in the District of North Vancouver caused the death of one person and dramatically changed the way the District assesses and manages hazards, which now includes provisions for adapting to climate change. In this case, an elected councilor used this 'crisis' to highlight climate change impacts, which then raised the profile of climate change among many colleagues.

The King Tides Photo Initiative was also a source of compelling imagery [16][17]. Originally an Australian initiative, the King Tides Photo Initiative invites BC public to "observe and photograph high water events (high tide/storm surge events) and imagine the future of BC's coastline with sea level rise". This initiative allowed people to capture images of iconic areas during weather events, providing snapshots of what to expect under changing conditions into the future.

Decision support tools

Access and availability of a number of tools helped to facilitate adaptation planning in local governments across the province. These included (i) provincially-driven guidelines for sea dikes and flood protection; (ii) risk assessment tools for projected climate impacts and costs; and (iii) visualization tools demonstrating climate change impacts both now and in the future. Visualizations and the presentation of different scenarios have proven particularly effective in allowing decision-makers to 'see' the potential impacts and risks associated with climate change.

Sea dike and flood protection guidelines

With funding from the BC RAC, the Province completed a series of technical studies to assist local governments and qualified professionals to incorporate sea level rise into coastal flood plain mapping, sea dike design, and land use planning. The provincial guidelines for sea dikes and coastal flood hazards spurred interest among municipalities [2][5][7].

> *"The draft adaptation guidelines for sea dikes and coastal flood hazard, and then the more recent report on the cost of implementing these measures, came from the Province… [This] has certainly spurred a lot of awareness and conversations among municipalities" [5].*

Risk assessment and planning tools

Regional climate change projections and impact assessments are essential inputs for adaptation planning and risk assessment tools, which provide a framework for local governments to track and assess their own unique risks. By using climate impact scenarios, these tools can improve understanding and communication of risks. Standardized planning frameworks can also be very helpful in guiding communities through the climate adaptation planning process. Three key tools were noted: Plan2Adapt, HAZUS, and the ICLEI guide and workbook.

Plan2Adapt was designed by the Pacific Climate Impacts Consortium (PCIC) to generate maps, plots, and data on projected future climate conditions and impacts for regions throughout British Columbia. A number of provincial and local government interviewees noted that the web-based Plan2Adapt tool provided local governments with localized data for vulnerability assessments and helped communities navigate the uncertainties of projected climate impacts [10][11][14].

CanHUG (Canadian HAZUS User Group)

HAZUS, a risk assessment tool from the US Federal Emergency Management Agency (FEMA), is a standardized methodology that contains models for estimating potential losses from natural hazard events such as floods and earthquakes, for use with Geographic Information Systems (GIS) technology. The HAZUS tool is available for use in the US without charge; however, users require access to GIS software, which does have a cost. HAZUS is used for risk reduction and recovery as well as preparedness and response, and its potential influence on adaptation planning in BC was noted [3][18].

This tool is being tested and reformatted for Canadian parameters by NRCan under the name of CanHUG (Canadian HAZUS User Group) as an additional tool for risk assessment of climate impacts and associated costs. It could be significant in helping to estimate the costs of physical, economic and social impacts of events such as landslides and flooding.

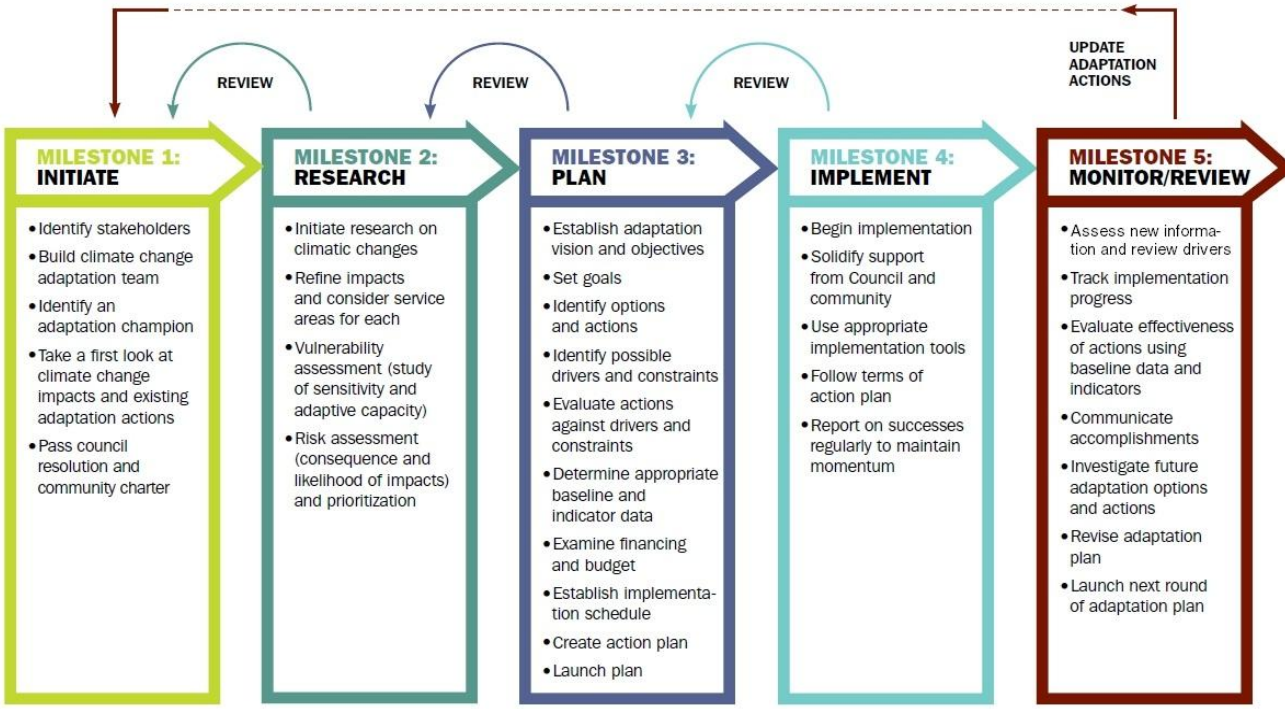
> *"Completing detailed risk assessments for a variety of natural hazards and their potential consequences has helped us to quantify the cost of response/recovery vs. the cost of adaptation. We are using the HAZUS model…to help us estimate the costs"* [3].

ICLEI Guide and Workbook

ICLEI Canada's Adaptation Initiative worked with seven BC communities to implement the *Changing Climate, Changing Communities: Guide and Workbook for Municipal Climate Adaptation* with facilitation and technical support from ICLEI staff. The initiative provides a five-milestone framework and local government access to ICLEI staff, for an annual fee based on the size of the community.

> *"Municipalities and regional districts are such a diverse group. It gets to the place where you need to adjust a template to local circumstances fairly quickly. [In that respect] I appreciated the flexibility of the ICLEI approach. There are also a lot of decisions to be made through the process, so having a framework that tracks reasons' logic is helpful"* [7]

ICLEI Canada's Five-milestone Framework, Source: ICLEI Canada, www.icleicanada.org/component/k2/item/79-adaptation-methodology



Scenario visualizations and presentation

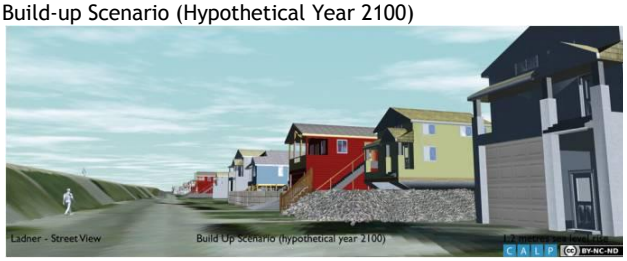
Visualizations were also seen as effective tools to personalize climate impacts and portray the potential costs of doing nothing [4][10][11][15][16][17][20].

> *"I think there needs to be some kind of emotional impact to spring people into action. That's why visualization tools are so effective, i.e., people can actually see their homes under water"* [1].

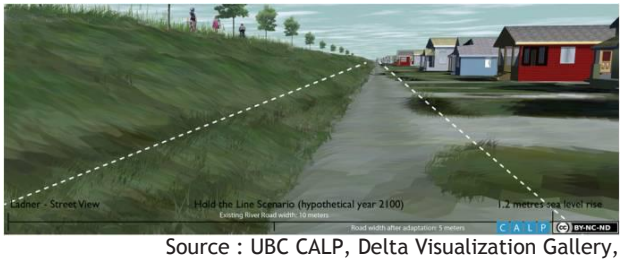
UBC's Local Climate Change Visioning Project developed visual scenarios to help residents in the coastal community of Delta understand the potential impacts of sea level rise. The Province also used this imagery in its communications with local governments, and more broadly at conferences [10]. Other imagery of note included water elevations in Victoria's Harbour [13] and Kitsilano pool [10] under sea level rise scenarios.

CALP Scenario Visualizations

Build-up Scenario (Hypothetical Year 2100)



Hold The Line Scenario (Hypothetical Year 2100)



Source : UBC CALP, Delta Visualization Gallery, http://www.delta-adaptation-bc.ca/category/adaptation-scenarios/

Floodplain mapping has raised considerable awareness as well. As one participant noted, "when I saw the floodplain maps and realized the ways our current urban and community infrastructure is already at risk, it changed my view of sea level rise planning for the future" [17]. Imagery of different futures has raised considerable public and political interest in the issue of sea level rise, particularly as it relates to deficiencies in existing infrastructure [4][10][11][15][16][17][20].

Leaders and champions

An important driver for local climate adaptation planning and action was the presence of champions and leaders at the provincial, regional and municipal government scale. Champions are those who spend either mandated or personal time working on the climate change file, actively seeking out relevant information and communications tactics to move the adaptation issue forward. Leaders have the power to steer and uphold the initiatives of champions and influence decision-makers to prioritize adaptation and allocate resources. The most innovative communities have leaders and champions working together at both the political and staff levels.

In 2009, the Ministry of Environment's Climate Action Secretariat (CAS) prioritized adaptation, creating a section dedicated to climate change adaptation. This team has contributed to network-building and adaptation communications that have generated awareness around the issue within the provincial government and more broadly [16][17][19]. In 2009, CAS also started to work more closely with staff at the Ministry of Community, Sport and Cultural Development (MCSCD) to improve understanding of the links of climate adaptation with local government functions [10][16]. As part of its leadership on the sea level rise issue, a formalized working group with a number of provincial ministries has been formed to address local and provincial issues regarding flooding and sea level rise. The Province has also commissioned scientific and technical studies on sea level rise, and issued guidelines to help local governments integrate adaptation planning measures into floodplain protection and management [14][15][16][19].

Leadership and internal capacity building in local governments ranged from executive leaders taking action on adaptation, to internal planning or engineering staff advancing the issue [4]. Interdepartmental cooperation, in two cases, was the result of a civil servant taking an interest and utilizing his or her authority. For instance, in Elkford, a senior staff person asked repeatedly that the assessment of climate impacts and risks be completed on proposals prior to project approval, advancing adaptation planning in overall municipal operations. Similarly, in Saanich, a concerned senior staff person organized a meeting of senior administrators in the region to discuss projected climate impacts and to elicit relevant response strategies. In other communities, engineering staff interested in managing risks to infrastructure, proactively commissioned critical technical reports, while planning staff have investigated projected impacts for short and long-term land-use planning.

These champions increased awareness of climate impacts and moved the adaptation file forward.

Learning networks and researcher-practitioner linkages

The development of a network of practitioners involved in community adaptation planning and the establishment of researcher-practitioner linkages mobilized awareness of and interest in adaptation to climate change in communities across BC.

CBT is supporting communities in the Basin to adapt to local climate change impacts through its *Communities Adapting to Climate Change Initiative (CACCI).* The Columbia Basin Trust's (CBT) *CACCI* was noted as a leading organization contributing to adaptation planning in the province, due to the 'uniqueness' of the expert and funding support it provides [9][10][19]. One interviewee suggested that CBT's unique "hybrid role is something between a large regional district and the United Way," contributing practical applications to meet the specific needs of communities [19]. CBT's model has been communicated through multiple forums, such as the Union of British Columbia Municipalities (UBCM), leveraging the potential in other communities. Communities that participate in the CBT initiative are supported by CACCI's 17-member technical support team, which helps to build local capacity by providing specific advice and expertise through an adaptation learning network. This initiative is supported by advisors from academia, First Nations and government institutions, as well as community development practitioners.

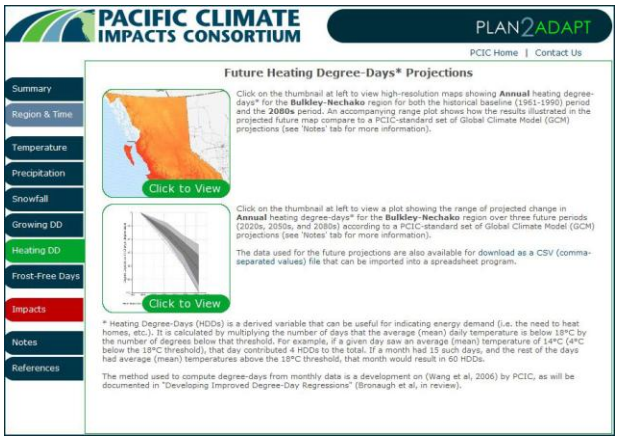
Bringing climate experts and researchers into communities has helped generate awareness about the issues and, in some cases, mobilize Council and public support on issues of adaptation. Action research occurring between university researchers and local government practitioners has played a considerable role in motivating adaptation [2][4][5][9][10][15]. In one particular community, an academic researcher was credited with turning a skeptical Council around by emphasizing impacts and vulnerabilities particular to the community's watershed protection and flood risk management [9]. Another example of this type of research, the UBC-CALP Local Climate Visioning Project, was viewed as raising the profile of both sea level rise and the state of existing dike and flood protection infrastructure in a rigorous and relevant manner [9][10][11][14][15][16].

Intermediaries such as Fraser Basin Council (FBC) have played an important non-governmental role in amplifying the issue of adaptation in the province. FBC's sustainability coordinators, located in communities across the province, have built capacity on climate change [10]. In addition, FBC played a significant intermediary role in coordinating and administering RAC funds in BC and mobilizing climate projections for floodplain protection and flood management through existing networks of practice, such as the Joint Program Committee for Integrated Flood Hazard Management [11][13][18]. This introduced "sea level rise and changing spring freshets as a layer of complexity, in a venue that naturally fit" [18]. Currently, FBC is leading the effort for creating a regional sea level rise adaptation strategy in the Metro Vancouver region and is currently drafting a business plan.

Targeted funding

The overwhelming consensus among interviewees was that RAC funding accelerated the adaptation planning and action already occurring in the province, and added value by providing a collaborative forum for these efforts and increased engagement among organizations and actors, which may not have occurred otherwise [9][11][12][13][14][18].

PCIC Plan2Adapt Web Interface, source:
http://www.pacificclimate.org/tools-and-data/plan2adapt



Two projects in particular would have not happened without access to BC RAC resources. One project - the Plan2Adapt impacts tool - allowed the Pacific Climate Impacts Consortium to make regional climate projections more accessible to local government planners, by categorizing impacts in ways familiar to them. The second project developed local climate change projections to support adaptation planning in a number of municipalities in the south coast region of BC (*Georgia Basin: Projected Climate Change, Extremes, and Historical Analysis*, 2012).

A common concern highlighted by local government participants is that climate change planning is not adequately resourced. Local governments that did

not participate in the RAC initiative face potentially higher costs to achieve the same results as those that did. Local governments with adaptation plans are wondering how to fund implementation of their plans. Participants indicated that stable, permanent funding support would enable sustained action on adaptation across BC.

LESSONS LEARNED

Several lessons emerged from this case study.

1. Strategic allocation of funding can leverage existing momentum, resulting in greater success. The RAC funding increased existing capacity and enabled partners to proceed with projects they would not have been able to fund if acting alone.

2. Concerns about legal liability can both aid and hinder adaptation planning. Concerns about corporate risk and liability have played a role in motivating some local governments to take action. Some communities sought legal advice [9][15]; this advice mirrored the standards of practice outlined in the Local Government Act and Community Charter, which advance the notion of local government as a steward of public assets, "fostering the current and future economic, social and environmental well-being of its community" [9][15]. Implicit in this responsibility is the need to integrate emerging information of risks and hazards to communities, such as projected climate changes.

In some areas, communicating publicly about vulnerable areas is seen as a politically charged topic, with repercussions for real estate and property owners. Some local governments are wary of treading into this complex terrain. Others are currently liaising with real estate associations to begin raising awareness around this challenge [4][15].

3. Creative communication tools help to build awareness and momentum. Experimental communications are a unique and effective way of bringing climate change home to people in their communities (Shaw et al 2009). The use of imagery that depicts possible impacts of projected conditions, such as the impact of King Tides on current infrastructure or the effect of future sea level rise on nearby or iconic locations has been effective at focusing the attention of the public and politicians around the challenges associated with rising sea levels.

Recent experiences with natural hazard and storm impacts in communities have informed conversations about anticipated future effects and the need for considering adaptation to climate impacts over time. Most participants identified that the media coverage of natural hazard events is increasing, thereby increasing public attentiveness to climate change issues. Harnessing local risk issues and public attention has been helpful in accelerating adaptation planning.

4. **Collaboration and partnerships can increase awareness and mobilize support.** Within government, collaborative interdepartmental and intergovernmental approaches as well as internal capacity-building processes linked municipal staff, practitioners and academia and served to support and reinforce the need to integrate adaptation planning within the governments' policy and planning processes. Also, the networks created by the BC RAC provided key actors working on adaptation with opportunities to exchange information across the province.

Within communities, **the networks of practitioners** involved in community adaptation planning and the establishment of researcher-practitioner linkages increased awareness and public interest and mobilized communities' support for adaptation to climate change. These networks supported and reinforced the efforts of the leaders and champions within government.

CONCLUSION

The BC RAC played an important role in accelerating adaptation planning in BC communities. Investment in information and tools, the creation of networks, and sharing of knowledge in diverse ways supported leaders and champions in their efforts to advance adaptation planning. Communities are incorporating adaptation into existing planning and risk management, as awareness among the public, practitioners and decision-makers grows. Challenges remain, and this case study highlights the important issues of funding and implementation as key concerns for continued adaptation planning in BC. As well, communities are working in various ways to deal with risk perception and concerns around responsibility and liability relating to climate change impacts. Communication is closely linked to risk perception and decision-making around tradeoffs, and the use of experimental and conventional means of communicating about impacts and risk has proven to be effective.

Community adaptation planning in BC is a process being driven by leaders and champions at many levels and partnerships and collaboration are central factors contributing to its success.

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Aussi disponible en français sous le titre: *Planifier l'adaptation : l'expérience des administrations municipales en Colombie-Britannique*

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