Experiences with collaborative climate impacts assessments for regional governments in southwestern British Columbia

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Introduction

Regional and local governments in British Columbia are recognizing the need to obtain detailed information about the effects of future climate change in their communities. The Pacific Climate Impacts Consortium (PCIC) has been a source for relevant analysis and information focussed on climate projections and impacts in BC since 2005. Recently, PCIC has moved away from preparing reports directly for users and instead worked in a more collaborative framework with several communities. In this new format, PCIC supplies climate projection information and assistance with interpretation, while allowing users to develop assessments tailored to their individual needs. This new structure allows PCIC to be more relevant in informing adaption practices. Our goal is to describe the process and outcomes from several collaborative climate change assessment projects.

Climate Assessment Regions

We conducted assessments in seven different areas in south western British Columbia that vary in size, population, land use, topography and expected climate change impacts.

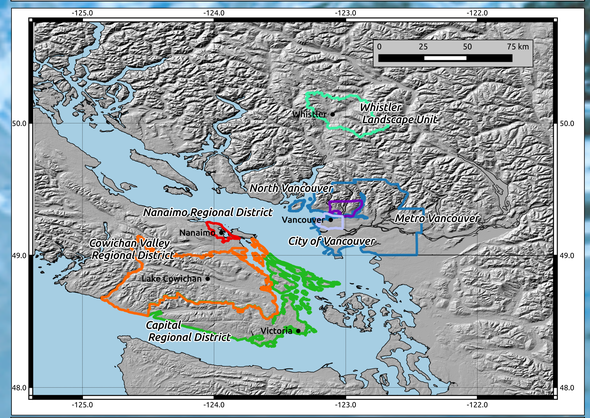


Figure 1. Topographic map with the seven climate assessment regions outlined for southwestern British Columbia.

Table 1. Geographic information for each of the seven climate assessment areas including size, population and general descriptions.

Region	Size	Population	Terrain	Governance
Metro Vancouver	2,900 km^2	2.5 Million	Mountains, coastline, river delta, mix of urban and rural	Regional administrative body for 23 municipalities, strategic departments
City of Vancouver	115 km^2	600,000	Coastal, heavily urbanized	City council and local government
North Vancouver	160 km^2	85,000	Mountains, coastline	City council and local government
Capital Regional District	2,400 km^2	390,000	Coastline, islands, urban core and rural	Regional administrative body for 13 municipalities, strategic departments
Cowichan Valley Regional District	3,500 km^2	80,000	Rural, agriculture, river valley, locally urbanized	Regional board for 4 municipalities, and nine electoral areas, regional planning committees
Nanaimo Regional District	60 km^2	83,000	Coastline, urban	City council and local government

An Iterative Process

- Communication between scientists and users helps develop a common vocabulary when discussing impacts, which is important when considering different climate variables.
- Assessments begin with simple overviews of climate impacts, what engineers want and policy makers need.
- Scientists learn what impacts information is most applicable to local governments – can guide development of new analyses (e.g. need for snowdepth information leads to development of snowpack model).
- The iterative process works to refine current understanding and develop flexibility given imperfect information.
- Multiple drafts starting early in the assessment leads to greater agreement and consensus at the end.

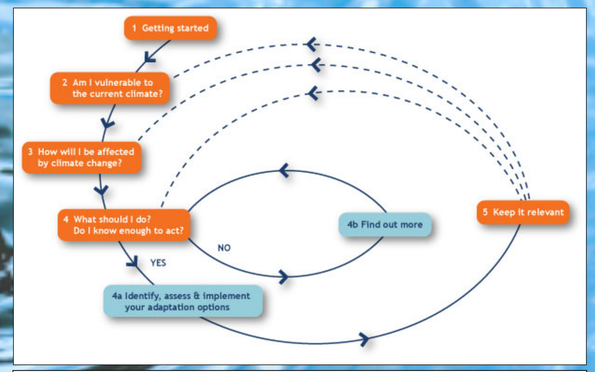


Figure 2. Schematic of the iterative process guiding collaborative assessments and adaptation planning. Whether undertaking an assessment for first time or building on past work, developing current strategies for adaptation requires ongoing communication, revision and responses to new information.

Variable	Definition	Initial thoughts on impacts
Climdex		
cdd	Consec. dry days	wildfire, agriculture
cwd	Consec. wet days	water supply
rx5day	Max 5-day precip	flooding
tnn	Minimum Tasmin	heating, pests
txx	Maximum Tasmax	cooling, heat waves
Snowpack		
apr1	Apr 1 Snow Depth	water supply, skiing
Degree days		
cdd	Cooling DD	buildings, water supply
gdd	Growing DD	agriculture, pests
hdd	Heating DD	buildings
fdd	Freezing DD	agriculture, skiing
Return periods		
pr	20-yr max 1-day	flooding, stormwater
tasmax	20-yr max Temp	heat stress, wildfire

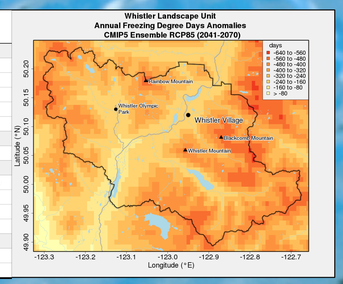
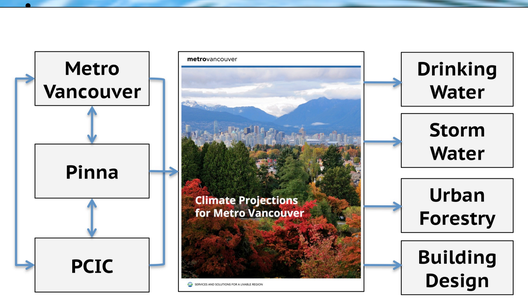


Figure 3. Example climate indices (left) and maps (right) evaluated for use are displayed for Whistler. Shared documentation that can be reviewed and edited by both scientists and users helps clarify precise variable definitions and which variables are important for the assessments.

Collaborative Assessments

The key findings are:

- Early and ongoing dialogue between scientists, policy makers and assessment authors is crucial for success.
- Knowledge that the climate assessment will be used as reference for further focused reports (storm water impacts) helps determine what impacts are key for the final report.
- Regional governments with clear administrative hierarchies and more resources are better equipped to accept and implement assessment recommendations more effectively.
- Having a motivated, single point of contact within the government body helps maintain assessment progress.
- Involving a third party author for the final project report allows for both climate projections and policy options in the final assessment – not feasible if written separately.



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metro vancouver

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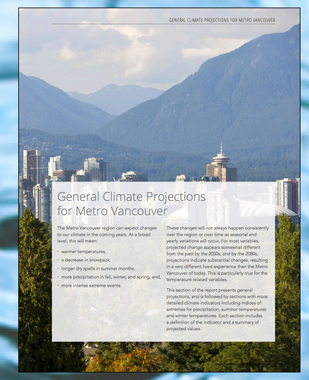
Figure 4. Schematic of the collaboration process between PCIC, Metro Vancouver, and Pinna Sustainability. All three groups communicate and contribute to the main climate assessment, written by Pinna. The broader climate assessment then informs specific assessments by departments within Metro Vancouver and is distilled into infographics for public presentation.



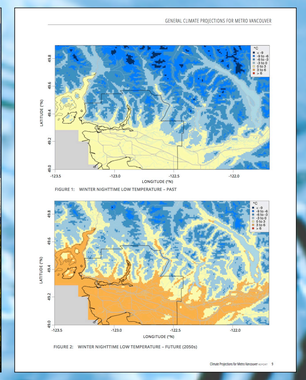


Figure 5. Example pages from the "Climate Projections for Metro Vancouver" collaborative report. The content includes the general descriptive changes expected for the region (left), and maps (right) and tables of projected changes for a suite of climate variables provided by PCIC.

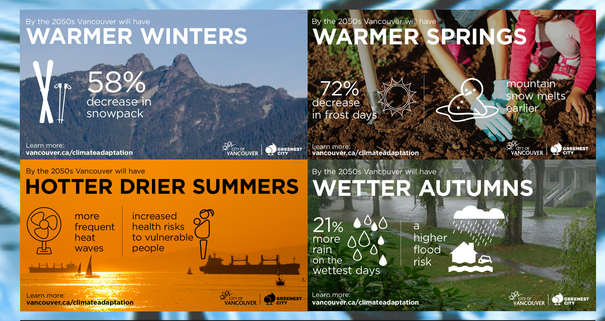


Figure 6. Examples of climate change effects publically presented by the City of Vancouver distilled from PCIC climate change projections. The infographics were produced by the city for display at public meetings to foster ongoing conversations about climate change in Vancouver.

Conclusions

Ongoing discussion between climate scientists and users helps reduce the mismatch between what users would like and what is feasible. Involvement of regional governments allows for the inclusions of policy suggestions by users, advice normally beyond the scope of PCIC's mandate as a climate services provider. The collaborative approach results in assessment information of greater value to all involved parties compared to a process with separate climate projection and impacts components. Future work will focus on continuing the iterative process and improving the means of distributing information for climate change impacts in additional regions.

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Acknowledgments

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