Territorial Analysis and Survey of Local Government Priorities for Climate Action: Vancouver Island and Coastal Communities

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University of Victoria

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COVER PHOTO: Cortes Island, Catriona Mallows

Introduction

Territorial Acknowledgement

The authors respectfully acknowledge that the Vancouver Island and Coastal Communities Region is located upon the traditional unceded territories of many different Indigenous peoples. Although every effort is made to use unbiased data, much of the data is not framed to adequately reflect Indigenous realities.

The climate change challenge

Climate change is a complex and ongoing challenge that communities across the Vancouver Island and Coastal Communities Region (VICC) are tackling through a range of approaches. By 2050, it is anticipated that British Columbia will experience:

- Temperature increases of 1.3 to 2.7 ˚C;
- Increases in average annual rainfall from 2% to 12%, with summers being increasingly drier;
- Loss of glaciers resulting in changes to fish habitat, declining quality and storage of drinking water; and
- Continued rising sea levels along most of B.C.'s coast, more frequent wildfires and rainfalls (Province of British Columbia, 2020).

These environmental changes will have wide-ranging effects, from more frequent and severe heat waves and a greater propensity for forest fires to major disruptions in agricultural growing conditions. Climate change impacts all sectors of society and the economy now and in the future.

Our communities are connected in tackling this challenge. The Vancouver Island and Coastal Communities (VICC) region is already experiencing unique climate changes.

The **Vancouver Island and Coastal Communities Climate Leadership Plan Steering Committee** (VICC CLP SC) has been convened by three Vancouver Island Mayors—Lisa Helps (Victoria), Josie Osborne (Tofino), Michelle Staples (Duncan)—in order to help catalyze climate mitigation and adaptation throughout the region. The VICC CLP SC includes representatives from each of the regional districts on the island and the Sunshine Coast to produce a plan that will catalyze climate mitigation and adaptation throughout the coastal region.

This report summarises the findings of *Territorial Analysis and Survey of Local Government Priorities for Climate Action: Vancouver Island and Coastal Communities.* Please note that the Territorial Analysis (Part 1) covers the full VICC region, while the Survey (Part 2) covers Vancouver Island and the Sunshine Coast.

Why coordinate at the regional scale?

British Columbia has been at the forefront of actions to promote climate change mitigation and adaptation and there is widespread support for these efforts. Communities big and small across the province have adopted a range of initiatives and there are a growing number of regional plans that aim to scale up these efforts and to promote co-ordinated actions. Climate change impacts are experienced at a local level, yet existing municipal and regional district governance structures can constrain climate action plans, making planning at a broader regional scale essential.

Regionally-scaled planning can help municipalities and Regional Districts to:

- Pool knowledge and map and understand functionally connected territories;
- Share expertise and build capacity;
- Share the costs of environmental assessments and other upfront planning needs;
- Co-ordinate and scale-up investments in adaptation and mitigation efforts;
- Speak with a common and louder voice to upper level governments about the region's unique needs and priorities; and
- Mutually support communities of all sizes to meet their climate goals, with larger administrations supporting smaller ones.

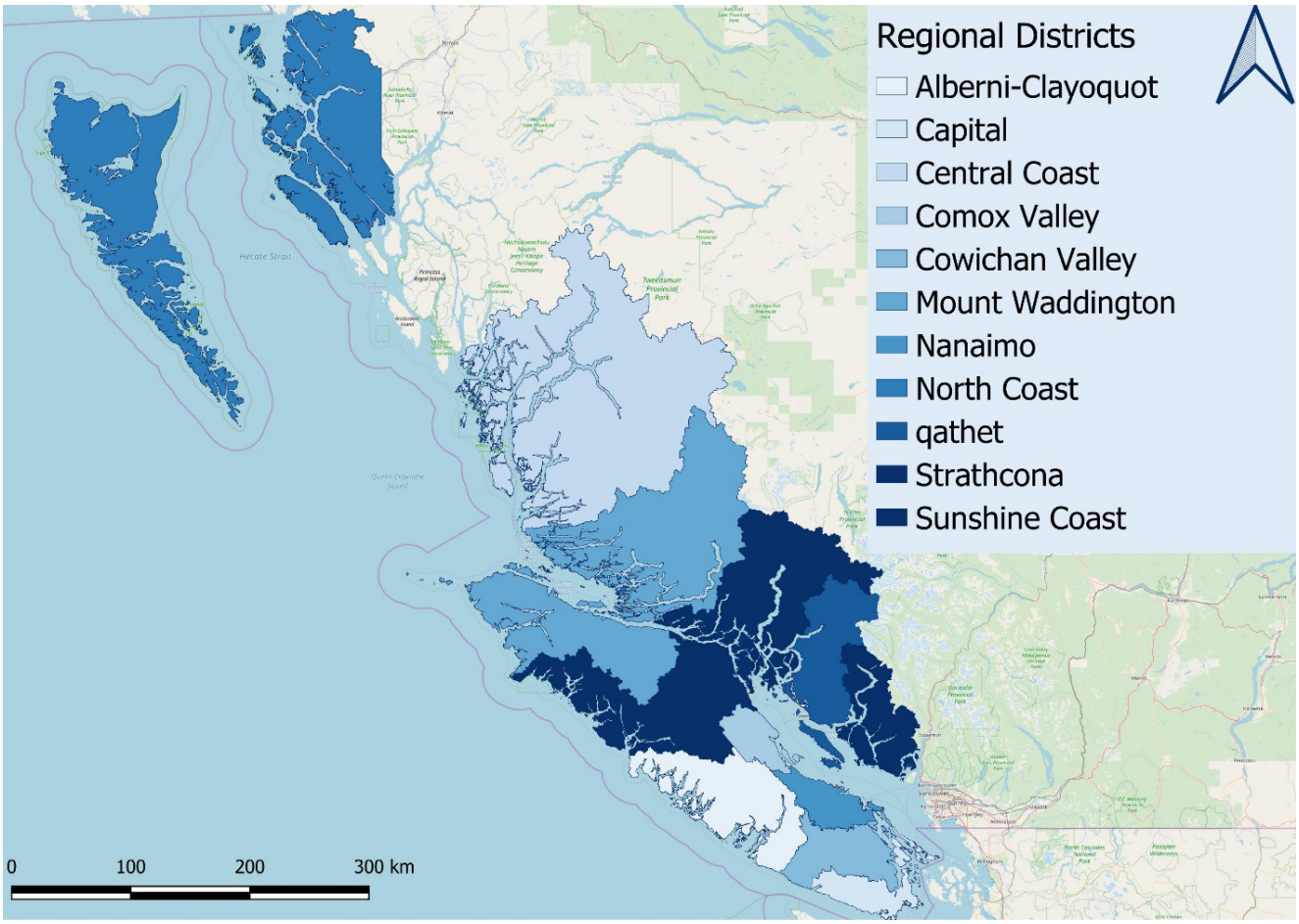
It is for these reasons that the VICC CLP SC has been convened. The VICC CLP SC shares a clear vision and priorities for its work, suggesting the potential for rapid collective progress. Collaborative planning at this scale thus offers a potential to build consensus and poly-benefits for climate action, including a shared regional vision to guide that action effectively and rapidly.

Cyclists on the Galloping Goose, Victoria, Catriona Mallows

Part 1. About the region

The Vancouver Island and Coastal Communities Region is comprised of 11 Regional Districts, 89 First Nations Reserves and Indian Government Districts, and 41 municipalities (Figure 1). The entirety of Vancouver Island and coastal mainland BC are the traditional territories of Indigenous peoples. The region is shaped by its proximity to water and includes approximately 40,000 islands of vastly different sizes and around 67 inhabited major islands, the largest of which is Vancouver Island. Many communities rely on connections to water for both transportation and livelihoods. Given the prevalence of coastlines, sea level changes pose risks as does the prospect of more frequent and severe storms. The mainland part of the region north of Vancouver is coastal and mountainous, with many areas having limited accessibility. In this region land transport connections flow east-west towards the Pacific. Coastal routes are the life-blood of communities.

Figure 1 Vancouver Island and Coastal Communities Regional Districts



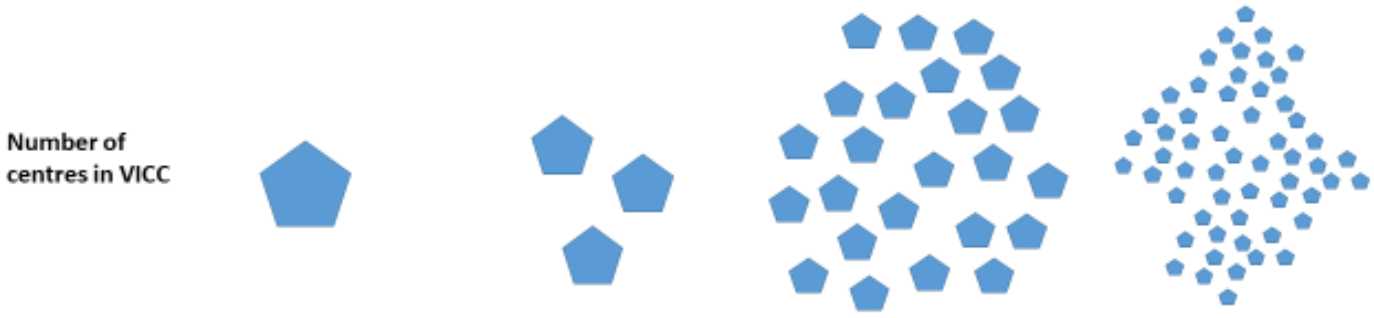
Source: British Columbia Data Catalogue. https://catalogue.data.gov.bc.ca/dataset/d1aff64e-dbfe-45a6-af97-582b7f6418b9 & https://catalogue.data.gov.bc.ca/dataset/nts-bc-coastline-polygons-1-250-000-digital-baseline-mapping-nts#edc-pow

Much of the region is low density, characterised by small communities—rural-urban connections are critical to this region

> "Small islands have a more obvious finite land base and natural resources and any climate impacts will have a greater impact to our communities."
>
> – Islands Trust

The vast majority (80%) of the VICC population resides in small to large population centers, while the remaining 20% live in what can be defined as rural areas—i.e., those without a population centre (Figure 2 Urban Hierarchy by Population Centre, VICC, 2016). However, despite this definition, rurality is best understood along a gradient of more connected and dense places to less connected and dense ones. Smaller communities and rural areas may access services and labour markets in larger population centres; at the same time, these communities provide many resources and amenities that larger communities consume and enjoy, and are also a source of employment. Rural-rural connections are equally important. Across VICC, the nature of these connections and interrelationships are a key character of society and economy.

Figure 2 Urban Hierarchy by Population Centre, VICC, 2016



Type	Large urban population centres	Medium urban population centres	Small urban population centres	Rural area
Population range	100,000+	30,000 – 99,999	1,000-29,999	<1,000
Population by type	335,696	172,160	168,017	171,630
Share of population out of total	40%	20%	20%	20%

Source: Statistics Canada; Population Centre and Rural Area Classification 2016 & Population Centre Profiles, 2016 Census

The unique geography of VICC creates both opportunities and challenges

VICC is a complex terrain with landcover ranging from Alpine areas to Wetlands. The variety of landforms create great topographic relief, resulting in various climatic shifts and ecosystem changes. There is an abundance of precipitation resulting in rich rainforests flanking the coast. Much of the VICC is covered by forest: 45% of VICC is classified as old forest (140 years or older); 14.7% is young forest (less than 140 years old) and large tracts of the forest have been designated for logging.[1] Approximately 7.5% of the total land of VICC is either recently or selectively logged, providing revenue and jobs for the region.[2]

Coastal British Columbia is known for its rich ecosystems, and many areas within the VICC region have been placed under protection in the form of Protected Areas and Marine Protected Areas. Protected Areas of all types are important to the VICC region in many ways, not only are they crucial for protecting wildlife and ecosystems, but also to preserve areas of important cultural significance.

Tahsis 7, Sarah Fowler

VICC is well connected to population centres, but some rural areas are at risk

Though VICC is physically expansive, the vast networks of roads, ferry routes, and air travel connect people and trade. There are 16 highways, 73 ferry routes, 12 airports and numerous aerodromes and seaplane landings. Connectivity is most concentrated in the southern reaches of VICC, linking population centres to the mainland and Vancouver. The four largest population centres in VICC (Victoria, Nanaimo, Courtenay, and Campbell River) are the most connected, with several highways and ferry terminals boasting high traffic thoroughfare daily. The northern communities, such as Bella Coola and Prince Rupert, are more isolated from the rest of the territory, as the only vehicle access is through the two highways which terminate at these cities or the ferry services. Some of the more rural reaches of VICC have fewer links to depend on, which creates a vulnerability especially when storms or other hazards threaten to block or wash out the local roads.

Population centers in the south are growing, while many rural areas are shrinking

The Regional Districts of VICC have a wide range of population growth in the ten-year period from 2006-2016, ranging from an increase of 12.3% to a decrease of –7.8%. The Regional District of Nanaimo has grown the most in the ten-year period while the Comox Valley and Capital Regional Districts had the second and third highest population growth respectively. The three districts with the highest growth rates from 2006-2016 all correspond to districts with large or medium population centres. The only other regional district with a medium population centre is the Strathcona Regional District, which falls in the middle of the range with population growth of 6.3% over 2006-2016. Between 2006-2016, a mix of urban and rural census subdivisions (CSDs) experienced population growth: Langford at 57.3%, Central Coast A at 47%, and South Saanich 1 at 44%. Those CSDs that have seen the greatest population declines over the 2006-2016 period are largely rural and remote.

There is a large and growing senior population across the VICC

The average age of population in the VICC region is 44.8 years; this is above the provincial average of 42.3. The dependency ratio (the ratio of the young and working age versus seniors 65+) is 72% in the region and 63.2% across the province.[3] Thus, the VICC has an older age profile than that of the province as a whole.

Certain CSDs within VICC are experiencing changes in age balances more acutely than others; during the ten-year time span of 2006-2016, the Southern Gulf Islands experienced a -14% and -21% decrease of young and working age cohorts, while simultaneously having an increase of seniors by 51%. Even more profound are the changes found in the CSD of Sunshine Coast D: the youth population decreased by -23%, the working age population decreased by -10%, and the senior population increased by 97%. These examples illustrate the more extreme cases of changing population demographics within VICC.

An uncertain economic climate

The BC economy overall has experienced solid growth and a favourable labour market climate. Following strong momentum in 2019, BC was forecast to lead economic growth in Canada in 2020 (Government of British Columbia, 2019). However, the COVID-19 crisis has brought great uncertainty; economic growth forecasts for all provinces have declined with many forecasting negative growth in 2020. The TD Bank has forecast BC's economic growth at 0.5% for 2020 (on par with Ontario).

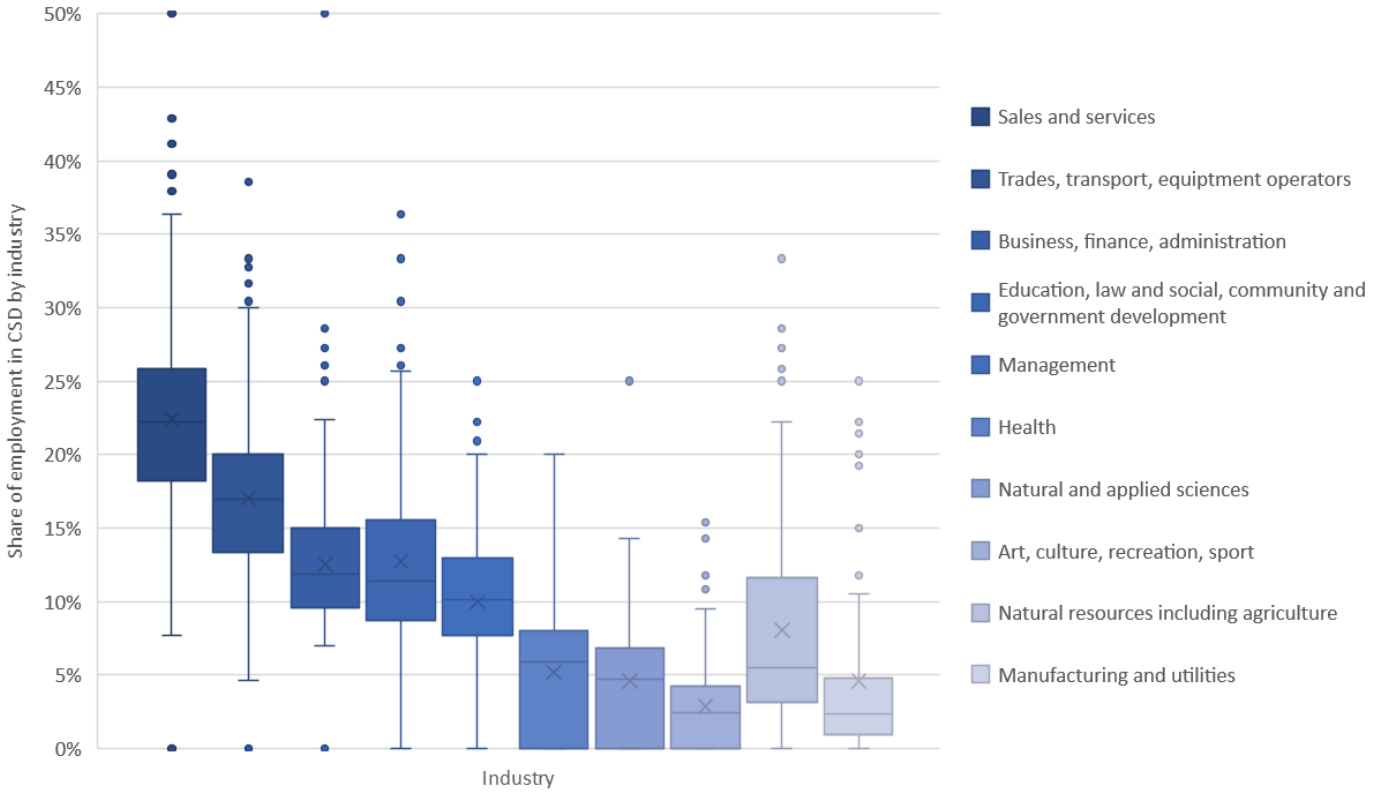
The VICC has a services-dominated economy—which in the short term is vulnerable to the impacts of COVID 19

Like the province as a whole, the VICC has a services dominated economy. Across the VICC, 87% of all occupations are service-based (CHASS, 2020). The largest services sectors by occupation are sales and services, trades and transport, and business, finance and administration. Some areas, especially those closest to population centres, are almost entirely services-based. The impacts of COVID-19 and negative price shocks have harmed all economic sectors, however they have been particularly harmful to services sector industries like tourism which are an important economic contributor across the VICC and the rest of BC. In 2018, the tourism sector in BC contributed $8.3 billion to GDP, which is higher than that of the mining ($5.2 billion), oil and gas ($4.9 billion) and agriculture and fishing industries ($3.2 billion).

> "The speed with which all levels of government and community responded to [the COVID-19] health crisis demonstrates the possibility, should the climate emergency be considered with a similar sense of urgency. There is a substantial opportunity for investment in climate change mitigation and adaptation as part of a green economic stimulus package."
>
> – Saanich

While the services sector is dominant, communities across the VICC also have important goods-based economies including the forestry, agriculture, and energy sectors. Goods-based industries are especially important in the northern halves of Vancouver Island and Haida Gwaii, as well as the mainland sections of the North Coast. BC's largely mountainous topography is not amenable to agriculture and the sector is relatively small; the smallest among Canadian provinces second only to Newfoundland. However, some of the province's prime agricultural areas are in the VICC such as Comox, Sayward and Cowichan valleys, Saanich Peninsula, Nanaimo lowlands, Alberni Valley, Powell River lowlands and many Gulf Islands. Farms in these areas tend to be smaller and specialized: the region accounts for only around 2% of total provincial farmland but 15% of total farms (Government of British Columbia, 2011).

Figure 3 Share of Employment by Industry, CSD, VICC, 2016



Note: Occupational categories by industry according to single digit National Occupational Classification codes, NOC.
Source: Statistics Canada; 2016 Census Labour Data, Accessed via Canadian Census Analyser (CHASS, 2020).

On average, residential GHG emissions have declined across the VICC

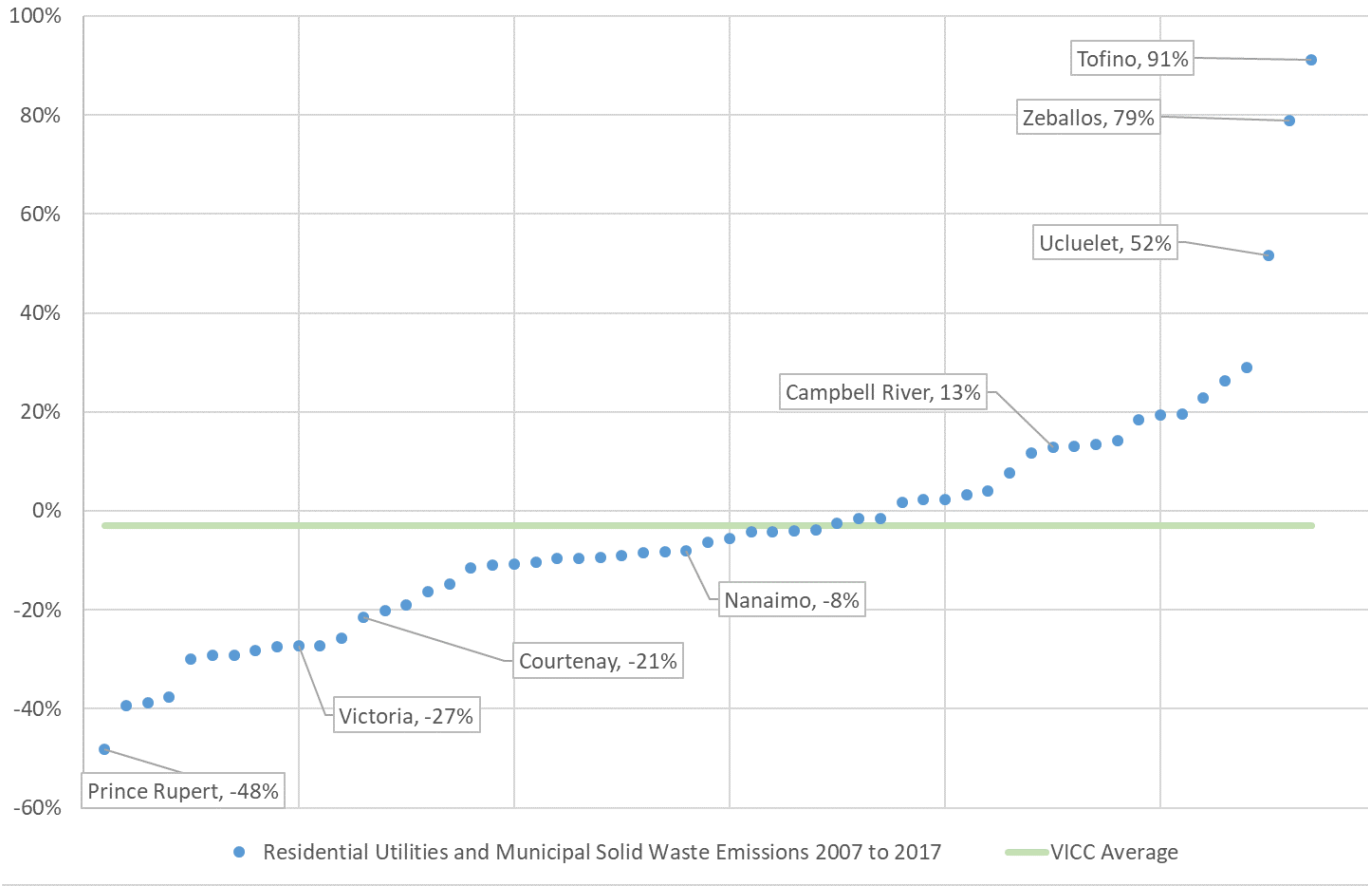
Residential GHG emissions from utilities and solid waste across the VICC decreased by 3% between 2007-2017 (Figure 4). At the lowest end, Prince Rupert has the greatest decrease in GHG emissions, at –48%, as well as having the lowest per capita residential utilities emissions for 2017 at 0.14 tonnes of carbon dioxide equivalent (tCO2e) (CAS, 2019). Port Edward, another northern community, has a decrease of -20% (CAS, 2019). However, not all northern communities are experiencing decreases in emissions; Masset and Queen Charlotte (Charlotte) on Haida Gwaii both have increases over the decade. This is likely a reflection on the remoteness of the islands, and is reflected in other island communities such as the Gulf Islands, which also are experiencing an increase in emissions. Another disparity is the difference within the Sunshine Coast communities; Gibsons and Sechelt are among the top five communities with the largest decreases, yet Sechelt Band Indian Government District is in the top five communities with the largest increases in utilities and solid waste emissions (CAS, 2019).

The community which had the highest residential emissions per capita in 2017 was Tahsis, at 7.40 tCO2e; but they also have among the lowest commercial and industrial GHG emissions per capita (at 0.13 in 2017) (CAS, 2019). More rural and isolated communities tend to have higher emissions because they do not have the capital to invest in the same scale of projects as more urban areas do, and often have to rely on diesel generators for much of their energy. These generators are not only high in emissions, but also in cost - a heavy burden for smaller communities. Higher energy demands may also be related to their location in colder climates.

The medium and large population centres of VICC all have changes below the territorial average, ranging from –8 to -27% (CAS, 2019). The decrease in tCO2e reflects the ability for urban areas to invest in greener infrastructure, low-emissions public transportation, and sustainable energy. These urban areas have had the ongoing opportunity to make such changes and investments and the data reflects the effectiveness of some of these initiatives.

PHOTO: Tahsis 6, Sarah Fowler

FIGURE 4 Percent Change in Residential Utilities and Solid Waste Emissions, per capita tCO2e, 2007 to 2017

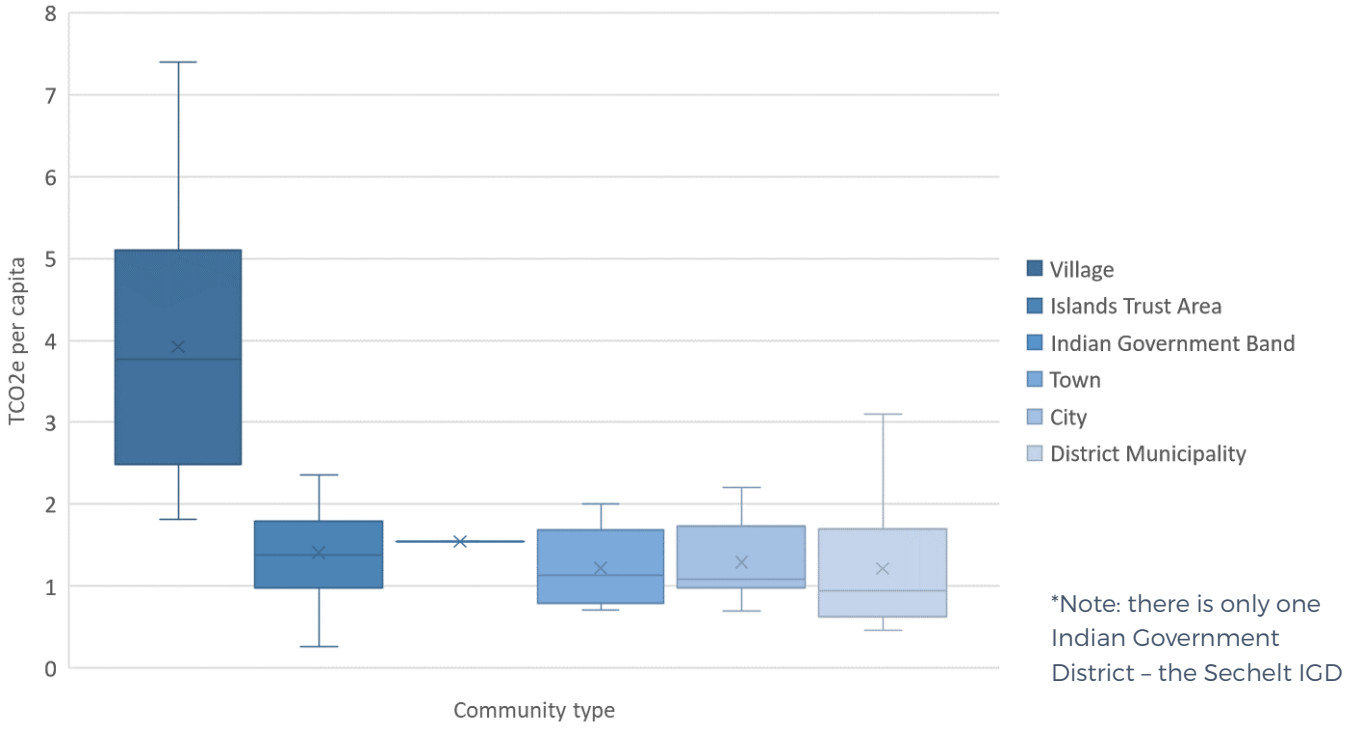


Source: Government of British Columbia Climate Action Secretariat (2019). BC utilities energy data at the community level, BC landfill waste data at the community level

Rural communities have the highest GHG emissions on average

Figure 5 Tonnes of Residential GHG Utilities and Solid Waste Emissions per capita, by Community Type, VICC, 2017 further illustrates the disparity between smaller communities and urban areas; the rural communities (villages) of VICC have the highest average residential GHG emissions in 2017, and includes places such as Tahsis, Zeballos, Masset, and Port Clements. These areas are all very remote in comparison to the population centres of VICC, and do not have access to the same connectivity or capital resources. Villages also display the largest range in emissions, indicating that some communities have invested in cleaner energy options, and others do not have that ability yet.

FIGURE 5 Tonnes of Residential GHG Utilities and Solid Waste Emissions per capita, by Community Type, VICC, 2017



Source: Government of British Columbia Climate Action Secretariat (2019). BC utilities energy data at the community level, BC landfill waste data at the community level

Energy use is by far the highest emitting sector for BC

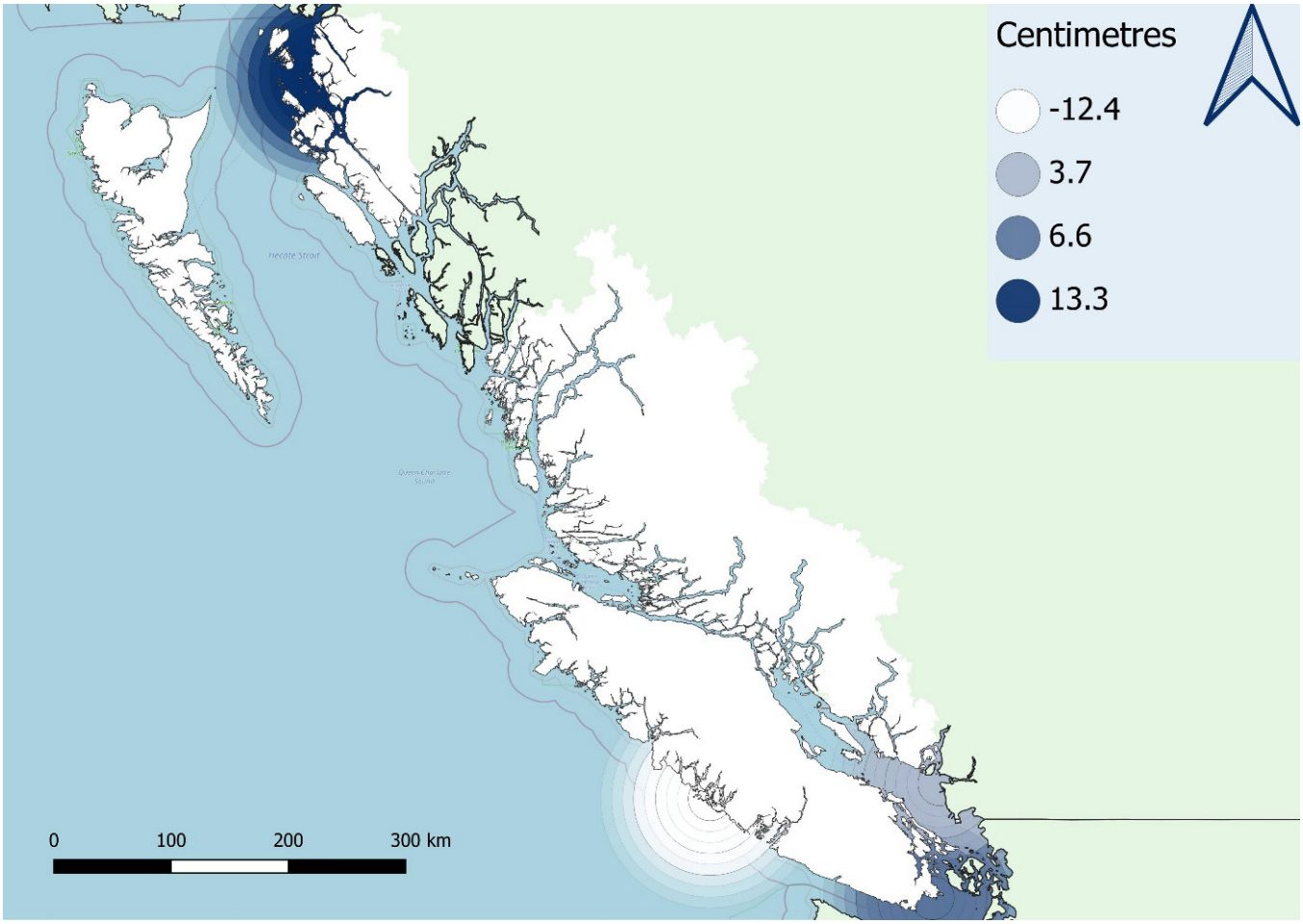
Although there are no further sectoral and sub-sectoral emissions data available for VICC, the Provincial Inventory can provide blanket characteristics for the region, drawing on the provincial trends. Energy is the largest sectoral contributor to total emissions, making up 81% of total BC emissions in 2017. The four other sectors, Industrial Processes and Product Use, Waste, Agriculture, and Afforestation and Deforestation, are all very similar in numbers, accounting for 6%, 5%, 4%, and 4% of total emissions respectively.

Transportation encompasses 50% of energy sector emissions. The VICC is heavily reliant on transportation in several ways; the region imports many of its goods (especially food) from other parts of BC by way of ferry systems and large transport trucks. Road Transportation makes up 34% of BC's energy emissions. Also, the rurality of VICC lends itself to an increased transportation sub-sector, as it requires significant travel to reach many of the remote and rural communities of the region. Oil and Gas Extraction is the next highest energy emitter at 14%, and Manufacturing Industries at 10%; both are part of the Stationary Combustion Sources sub-sector which is the second largest and accounts for 41%. These are not as dominant in VICC. Agriculture and Forestry are relatively low emitters, accounting for only 1% of the total energy emissions in BC.

As a coastal territory, the changes in the ocean pose a serious threat to communities within VICC

Sea level rise varies across the VICC. In Prince Rupert the average sea level rise was 0.13m/century, and 0.06m/century in Victoria, while in Tofino the average sea level dropped at -0.12m/century (BCMoE, 2016). At first this may seem counter-intuitive, but there is a simple explanation; due to the isostatic rebound from the last glaciation, parts of Vancouver Island are rising at ~0.25m/century, while other areas are not moving (to a significant degree) (BCMoE, 2016).

FIGURE 6 Observed Change Sea Level, Centimeters per Century, Coastal BC, 1910-2014



Sources: BC sea level data (Government of British Columbia, 2020c); *US cartographic file* (US Census Bureau, 2020); *BC cartographic file* (Government of British Columbia, 2020b).

The implications of sea level rise within VICC are vast, including:

- Flooding, especially beaches, wetlands, coastal dunes, and waterfront properties;
- More frequent extreme high-water occurrences, impacting property, infrastructure (docks, wharves, port facilities), especially in Prince Rupert;
- Salinification of agricultural lands from intrusion of saltwater into groundwater aquifers and;
- Wave changes, including magnitude and direction, as well as storm waves and surges (BCMoE, 2016).

In addition to sea level rise, the oceans are also experiencing an increase in temperature. From 1971 to 2010, the ocean surface increased on average by 0.11˚C/decade globally (IPCC, 2014). In BC, sea surface temperatures (SSTs) have increased since—although trends vary depending on areas, data availability, and seasons 1935 (Talloni-Álvarez, Sumaila, Le Billon, & Cheung, 2019). In the southern region of BC, sea surface temperatures have increased 0.56 degrees Celsius per decade since 1935, and are expected to increase by 3 degrees Celsius by the end of the 21st century (Talloni-Álvarez et al. 2019, 166). The increasing amount of CO_2 entering the ocean is altering the pH of the water, making it more acidic (Canadian Climate Forum, 2017). Nearshore and coastal waters on BC's coast are particularly vulnerable to acidification, as freshwater inputs from rivers, glacial meltwater and sea-ice melt decrease the ability for coastal waters to buffer CO2 (Bush & Lemmen, 2019, 399).

VICC is experiencing rising temperatures, putting vulnerable populations at a higher risk

Globally, temperatures have increased on average by 0.85˚C/century, while BC on average has experienced increases on average of 1.4˚/century from 1900-2013 (BCMoE, 2016). Due to the complex geography of VICC, there are variations in the average temperature increases. The southern coastal reaches of VICC have experienced increases of 0.8˚/century, while more northern areas, such as Prince Rupert, have experienced increases of 1.1˚C (BCMoE, 2016).

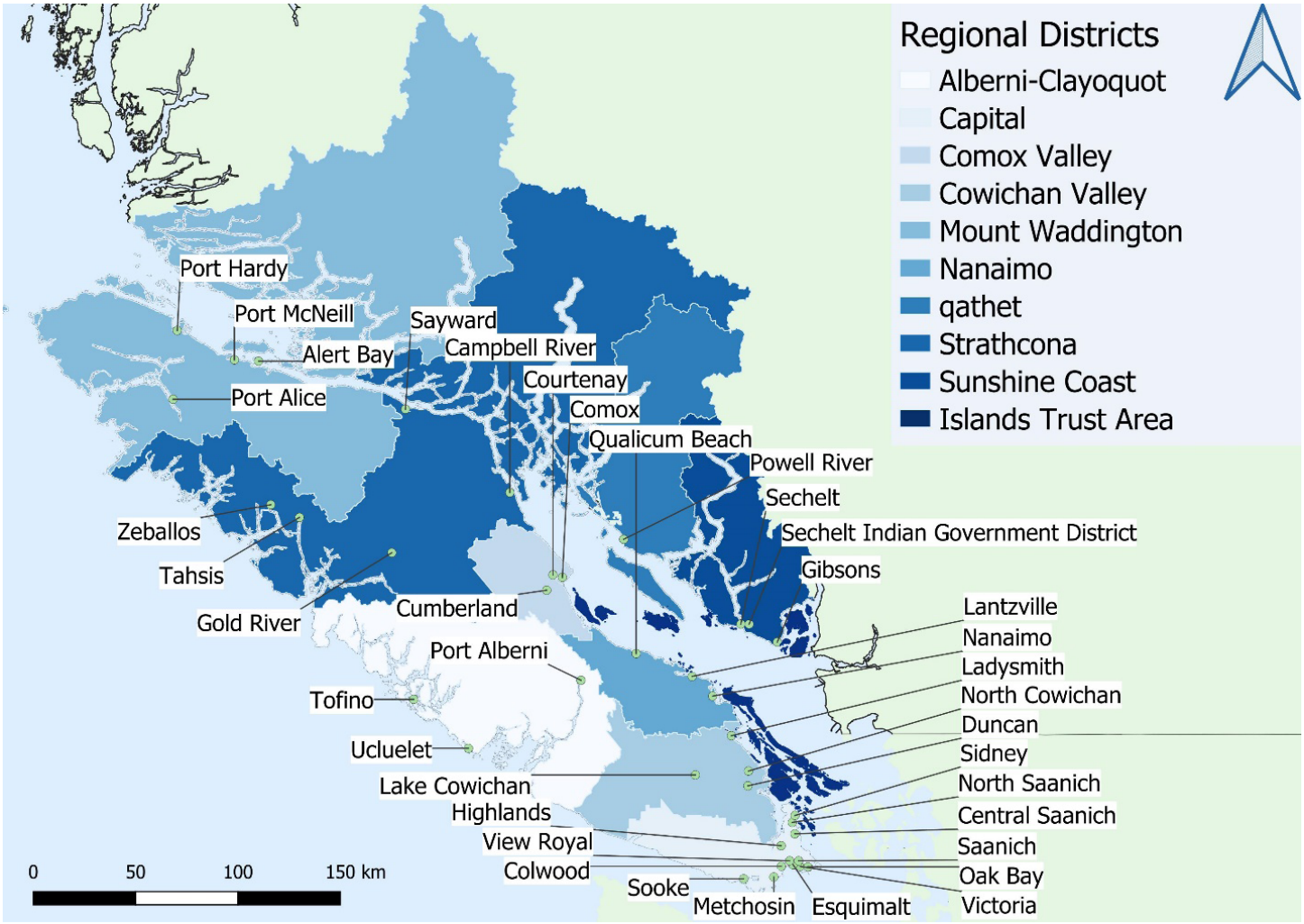
Heat waves are expected to happen more often in urban areas, because the built environment (paved roads, buildings, other infrastructure) retains heat more so than the natural environment (BCMoE, 2016). In Victoria, between 1951-1980, there were usually only 3 days a year which reached temperatures above 30˚C, but within this century that is expected to increase more than four-fold, to 13 days per year (BCMoE, 2016).

> "Cumulative/ compounding impacts will become increasingly challenging to address."
>
> – Capital Regional District

Part 2. Climate Adaptation and Mitigation Policies and Priorities

An understanding of the various climate impacts and policy priorities across the region is a key part of the regional climate planning process. This survey identifies the key climate impacts, policies, priorities, barriers, and opportunities that currently guide decision-making about climate change mitigation and adaptation in the region. A total of 106 government officials, including 69 elected representatives and 35 staff from 38 municipalities and 10 regional districts participated in the survey resulting in a 96% response rate. Only two municipalities did not participate in the survey (i.e., Langford and Parksville); all regional districts completed the survey. Multiple individuals from each local government were invited to participate in the survey, with responses for a single municipality or regional district aggregated into one complete response.

FIGURE 7. Regional districts and municipalities participating in the survey



Municipalities and regional districts are overwhelmingly supportive of climate action

The survey found that both municipalities and regional districts are overwhelmingly supportive of climate action: 100% of municipalities and regional districts answered that climate change mitigation and adaptation are "important" or "somewhat important" to their community.

An analysis of open-ended responses found that the top five common themes of motivation to act include: (1) public and/or political demand; (2) science and data on climate change, including observable impacts from changing weather patterns such as increased storms, droughts, and wildfires; (3) concern about sea level rise; (4) preparation for the future and concern for future generations; and (5) support and funding from senior levels of government. Several municipalities referenced their declarations of climate emergency and mentioned emissions reductions targets and/or climate action committees that have been established. Regional districts were particularly likely to mention senior government funding and support as an enabling factor in being motivated and able to take action

Climate change hazards and impacts are already being experienced

Virtually all municipalities and regional districts are already experiencing hazards and impacts related to changing weather patterns caused by climate change. The unique island and coastal geography of the region influences the types of hazards and impacts that are experienced in this area compared to other regions of the province. A 'hazard' refers to the potential occurrence of a natural or human-induced physical event or trend or physical impact that may cause loss of life, injury, or other health impacts, as well as damage and loss to property, infrastructure, livelihoods, service provision, ecosystems, and environmental resources. "Impacts" refer to effects on natural and human systems of extreme weather and climate events and of climate change. Impacts generally refer to effects on lives, livelihoods, health, ecosystems, economies, societies, cultures, services, and infrastructure due to the interaction of climate changes or hazardous climate events occurring within a specific time period and the vulnerability of an exposed society or system.

> "Climate change is a public and therefore political priority. CRD and Islands Trust emergency declaration is spurring action. Climate change impacts such as forest fires and drought are already being felt here."
>
> – Islands Trust

All except for one municipality indicated that they have experienced hazards related to climate change with wildfires, extreme rainfall, sea level rise, storm surges, extreme winds, and droughts being the key hazards. Municipalities and regional districts identified additional hazards other than those listed in multiple choice responses including tsunamis, earthquakes, heating tank oil spills, air quality, and pandemics. Tsunamis and earthquakes were the most frequently mentioned "other" hazards.

Wildfire and extreme rainfall were top hazards in municipalities of all sizes

Hazards were identified as more prevalent in large municipalities than small and medium sized municipalities. Although heat waves were not a top hazard overall, they were identified as more of a problem in urban areas, and are a top concern in two out of three of the largest urban municipalities. Landslides stood out as being more a concern for small municipalities as compared to medium and large municipalities, which may relate to the remote nature of many of the smallest municipalities.

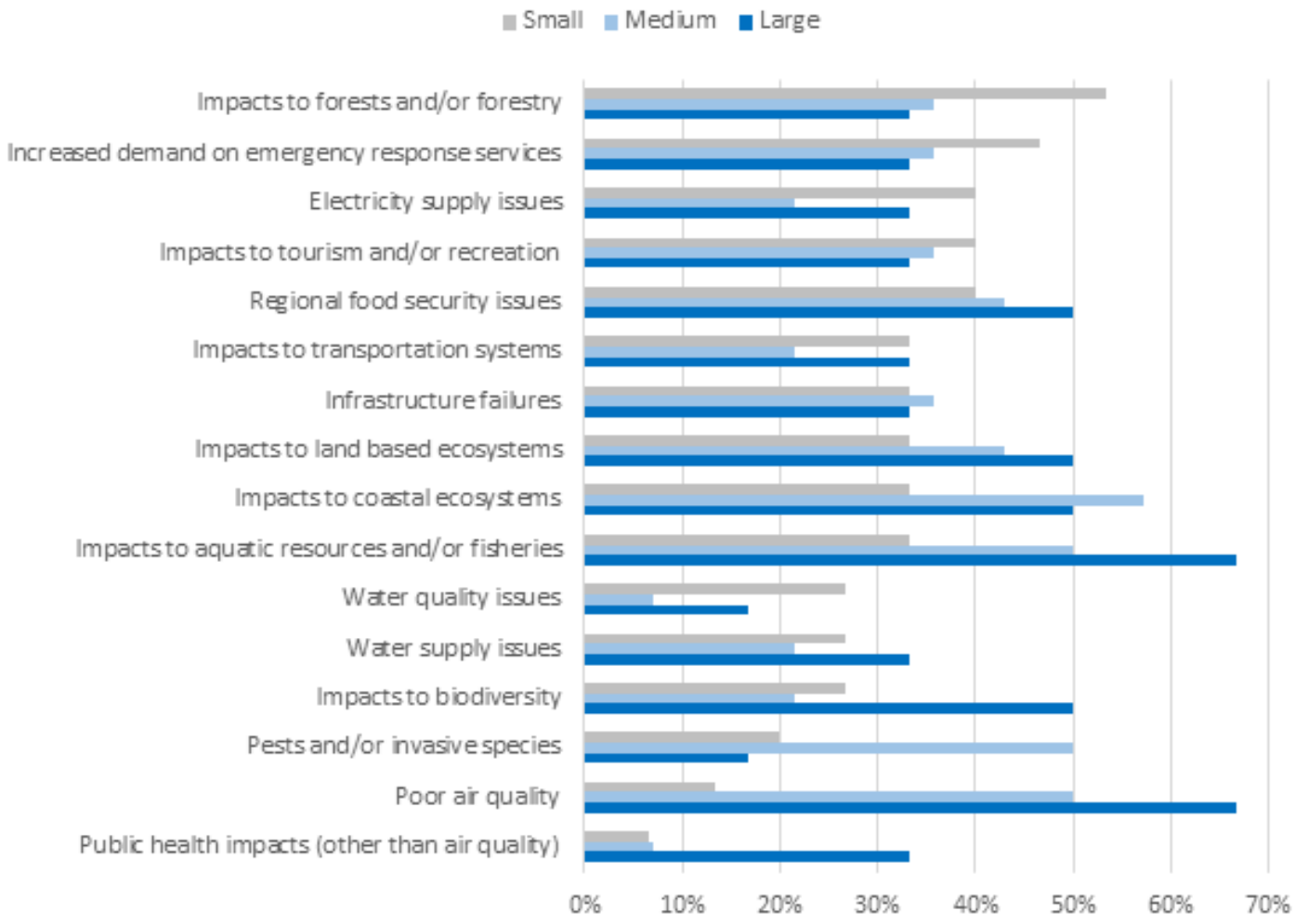
Russel Road washed away from heavy rain, Sunshine Coast, Donna McMahon

There are distinct regional differences in the impacts experienced

Small municipalities were more likely than mid-sized and large municipalities to identify impacts to forests and forestry, emergency response resources, electricity supply, tourism/recreation, and water quality. The impacts that are important to small communities reflect to some extent the closer linkage and dependency on natural resources, especially the importance of forestry. The demand on emergency response services may be a bigger problem for these small municipalities due to their smaller administrative capacity and the remoteness of many small communities.

Medium and large municipalities were more likely to identify impacts to aquatic resources, coastal ecosystems, and land-based ecosystems as a top impact compared to small municipalities. Large municipalities were the most likely to identify impacts to biodiversity compared to smaller municipalities. Air quality and health impacts were the least frequently chosen for small municipalities, but medium and large municipalities are much more affected by poor air quality and other types of public health impacts as compared to small and medium sized municipalities. These differences are even more pronounced when examining only the largest urban municipalities, all three of which indicated poor air quality as a top impact, with two out of three indicating other public health impacts.

Figure 8. Comparison of climate change Impacts by size of municipality

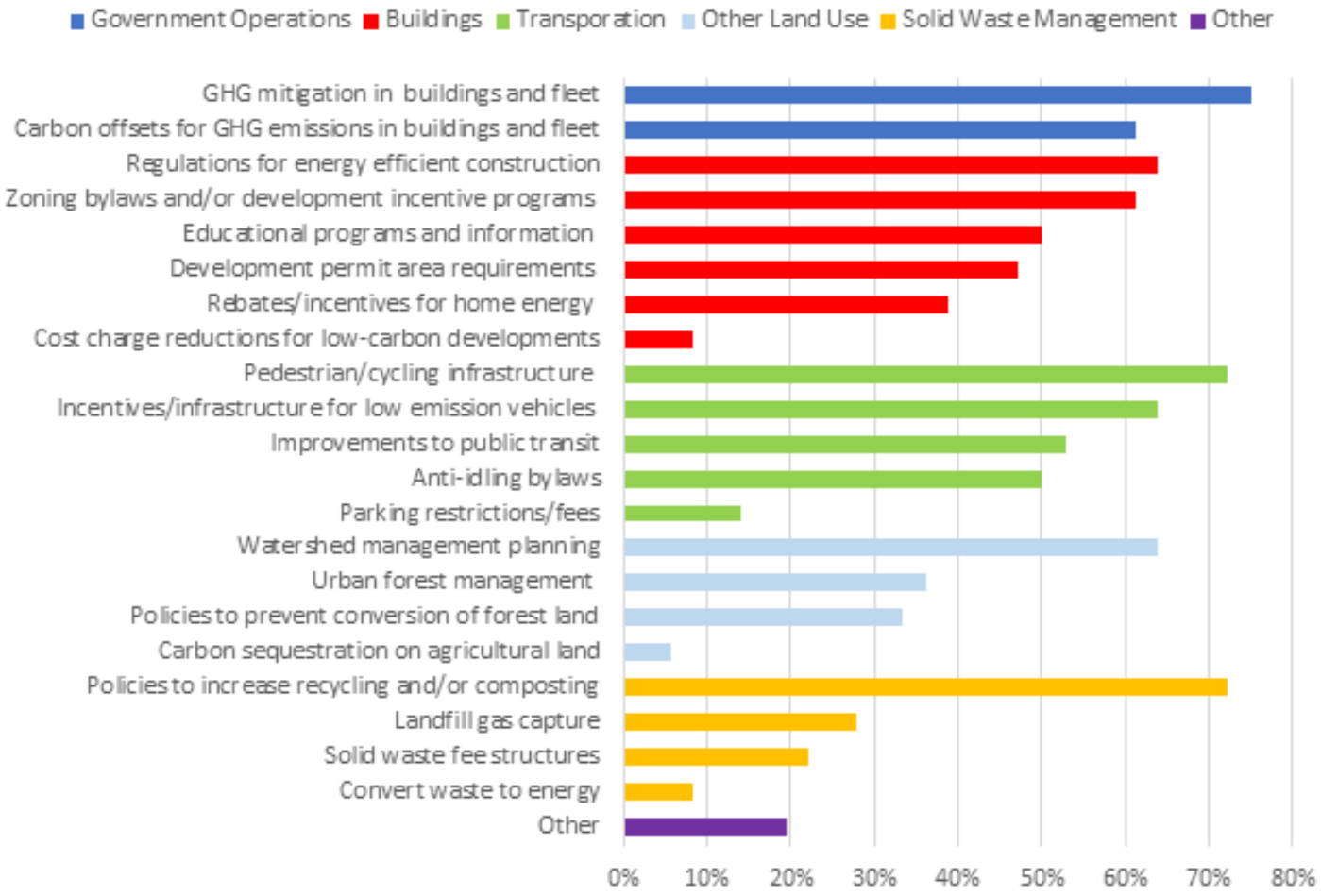


There is a high level for support for climate mitigation policies and practices

Municipalities and regional districts overall are highly supportive of taking action to mitigate climate change, and almost all have mitigation policies in place. Some of the most frequently mentioned priorities for climate change mitigation include: land use planning, green infrastructure, public transit, pedestrian and cycling infrastructure, building standards including civic buildings, fleet management, tree and forest conservation, and general community emissions reductions.

Municipalities and regional districts have implemented mitigation policies across a range of sectors, including government operations, buildings, transportation, land use, and solid waste management. Policies exist in almost all municipalities (Figure 9. Municipal mitigation policies by sector); only two indicated they have no mitigation policies currently in place. Most policies are investment-like policies, followed by regulations and incentives. The most frequently selected policy options included GHG mitigation in buildings and fleet (75%), pedestrian/cycling infrastructure (75%), and policies to increase recycling and/or composting (72%). Respondents were given the choice to indicate other policies not included in the list of options. They identified policies such as asset management, flood/sea level rise impact and mitigation studies, use of bio-diesel or renewable natural gas, investments in urban forest/tree planting, public education, corporate catering related to lower impact food choices, and establishing environment committees.

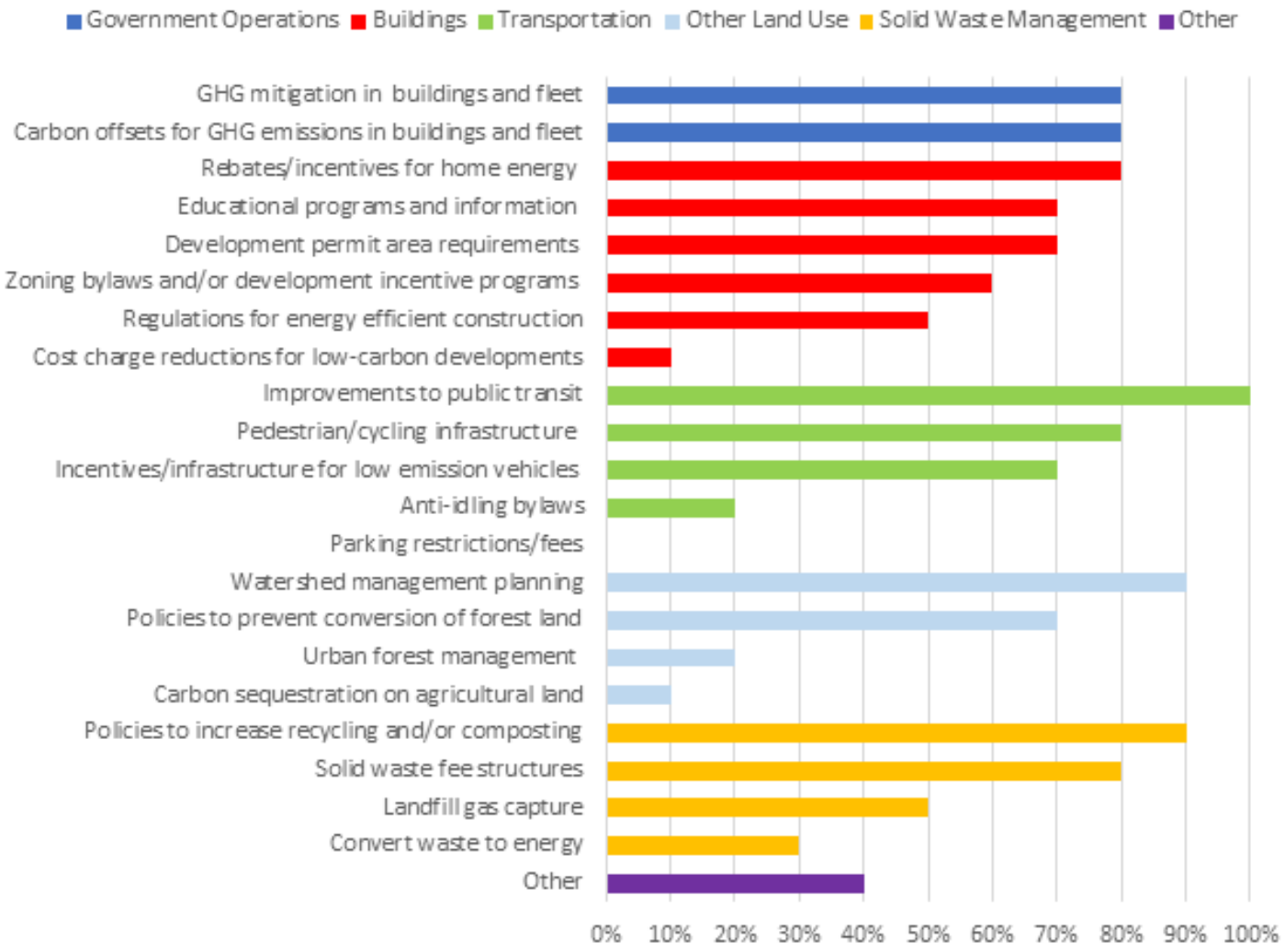
FIGURE 9. Municipal mitigation policies by sector



Climate change mitigation policies exist in all regional districts, across all sectors

Regional districts tend to have a higher number of mitigation policies in place compared to municipalities (average of 13 versus 9 for municipalities). The most frequently implemented policies in regional districts included improvements to public transit (100%), watershed management planning (90%), and policies to increase recycling and/or composting (90%). Differences in jurisdiction explain some of the differences in policies between regional districts as compared to municipalities; for example, regional districts tend to have more policies in the area of solid waste management. "Other" policies indicated by regional districts included water conservation measures, heat recovery, biosolids/woodwaste composting, integration of mitigation into plans including Official Community Plans and regional growth strategies, urban containment boundaries, emission reduction targets, and protection of Douglas fir.

FIGURE 10. Regional districts' mitigation policies by sector



Pedestrian and cycling infrastructure have the highest support

When asked about community support for different policy types, respondents indicated the highest level of support for investments in pedestrian and cycling infrastructure (69%), GHG mitigation in civic buildings & fleet (69%), and improvements to public transit (67%). In regional districts, the policies with the highest support included pedestrian & cycling infrastructure, rebates/incentives for home energy upgrades, and watershed management planning (100% each). Government investment and incentives, as well as voluntary actions tend to receive higher support than regulations and pricing.

> "Our staff is at capacity with existing work. We need more staff to manage new projects such as climate adaptation planning or even to finish the work on the list now."
>
> – Cumberland

It is uncommon to have dedicated staff working on climate issues

In terms of capacity, the majority of municipalities and regional districts do not have dedicated staff working on climate issues. Only 32% of municipalities and 40% of regional districts indicated that they have dedicated climate staff. Although the majority of municipalities do not have dedicated climate staff, four small municipalities do: Tofino, Ucluelet, Highlands, and Sechelt Indian Government District. Larger municipalities are more likely to have climate staff, with the four largest municipalities indicating that they all have dedicated staff. Regional districts with climate staff indicated they have between 1 to 4 staff.

There is a high level of support for climate adaptation policies

Similar to mitigation, municipalities and regional districts are overall highly supportive of taking action to help their communities adapt to climate change, and almost all have adaptation policies in place. Some of the top priorities for climate change adaptation mentioned in open-ended comments included emergency management planning, land use planning, infrastructure upgrades, green infrastructure, forest management and conservation, watershed management, asset management, water conservation, urban forests, food security and local food production, civic building standards, air quality, and planning for sea level rise. All regional districts and all but three municipalities have adaptation policies.

Support for adaptation policies varies

In municipalities, the most supported policies included storm water management (77%), emergency management planning (71%), and food security programs (71%). In regional districts, the policies with the most support included emergency management planning (100%), integration of adaptation into OCP/plans (100%), and lot level resiliency such as shade structures, rain gardens, rain barrels etc. (90%). One respondent noted that it is very difficult to gauge community support for the various policy options. Also, it was noted that in the case of regional districts, support can vary widely between communities.

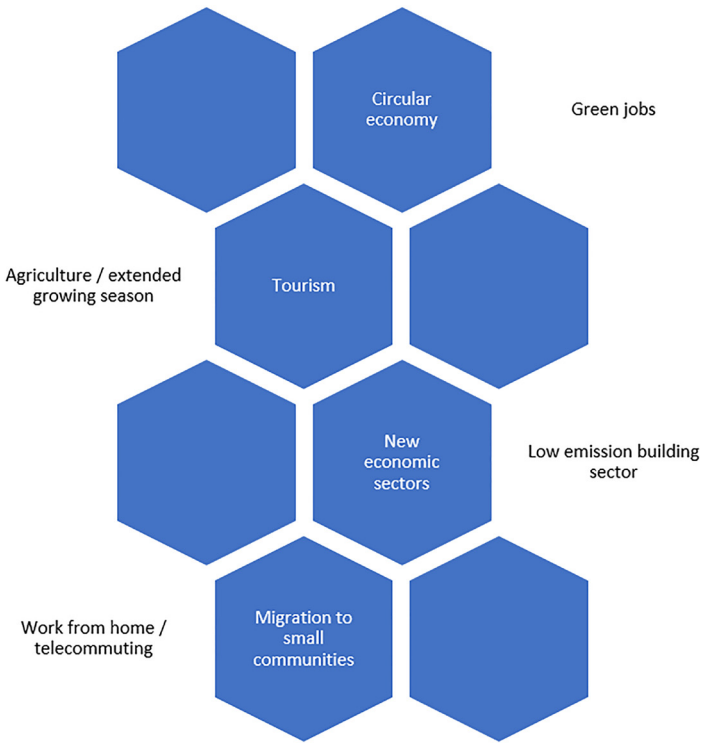
Barriers to action include a lack of financial resources and a lack of staff

Despite high levels of support for climate change mitigation and adaptation, local governments face a number of barriers to action, with lack of financial resources indicated as the top barrier for both municipalities and regional district. The second major barrier for municipalities is lack of staff capacity. Small municipalities face additional barriers including lack of expertise and limited data. Regional districts also tend to face additional barriers as compared to municipalities, struggling with limited authority and feeling a stronger lack of senior government support.

Opportunities for Climate Action: Green growth, clean energy, new jobs, rural vitality

Although responding to climate change is a huge challenge and local governments face a number of barriers to climate action, the climate crisis also presents opportunities for the future. Almost half (49%) of municipalities see new opportunities for their community as the climate changes; another 17% answered "maybe." Among regional districts, 70% anticipate new opportunities and 30% answered "maybe." Some examples of opportunities mentioned by respondents include building a circular economy, green jobs, benefits to agriculture including an extended growing season, tourism, new economic sectors such as the low emissions building sector, work from home/telecommuting opportunities, and increased migration to small communities, such as those in the VICC region.

Figure 11 Opportunities for climate action



Our shared future

> "Remarkable response to COVID by all levels of govt and by the public suggests we are capable of rising to the climate challenge. COVID has reinforced concerns about and is encouraging changes to address self-sufficiency (e.g., reliance on imported food and tourism)."
>
> – Islands Trust

Nearly all communities in the VICC region are already experiencing hazards and impacts related to changing weather patterns caused by climate change and most expect these hazards and impacts to continue and/or worsen into the future. Both municipalities and regional districts are overwhelmingly supportive of climate action, with 100% of local governments surveyed answering that climate change mitigation and adaptation are either important or somewhat important to their community. The vast majority of municipalities and all regional districts also indicated that their communities are supportive of implementing mitigation and adaptation policies. Most municipalities and all regional districts have implemented policies related to climate change mitigation and adaptation, with the numbers and types of policies varying by geography and by size of municipality. Despite these high levels of support for climate action, local governments face multiple barriers, particularly related to lack of financial resources and staffing capacity.

A lack of funding is a major barrier to local governments when it comes to climate change mitigation and adaptation. Limited authority and lack of senior government support were also important barriers, especially for regional districts, and survey respondents called for more regulatory and financial support from senior levels of government. This support could help build essential low-carbon infrastructure and fund community-level modelling projections to assess localized climate change impacts as well as the impacts of various policies on GHG emissions and costs to choose among most effective and efficient municipal and regional climate policies.

References

Ancient Forest Alliance. (2016). Action Alert: Speak up for Ancient Forests to the Union of BC Municipalities (UBCM)! - Ancient Forest Alliance. Retrieved May 30, 2020, from https://www.ancientforestalliance.org/action-alert-speak-up-for-ancient-forests-to-the-union-of-bc-municipalities-ubcm

BCMoE. (2016). Indicators of Climate Change for British Columbia, 2016 Update. Retrieved from https://www2.gov.bc.ca/assets/gov/environment/research-monitoring-and-reporting/reporting/envreportbc/archived-reports/climate-change/climatechangeindicators-13sept2016_final.pdf

Bush, E., & Lemmen, D. S. (2019). *Canada's Changing Climate Report*, *Government of Canada*. Ottawa.

Canadian Climate Forum. (2017). *Ocean Acidification in Canada's Coastal Waters*. Retrieved from https://climateforum.ca/wp-content/uploads/2017/04/CCF-IP_6-OA-MAR-30-2017-SCREEN-FINAL.pdf

CHASS. (2020). Canadian Census Analyser . Retrieved May 13, 2020, from http://dc1.chass.utoronto.ca.ezproxy.library.uvic.ca/census/

Government of British Columbia. (2011). Census of Agriculture . Retrieved April 27, 2020, from https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/agriculture-and-seafood/statistics/census/agricensus_2011_bchighlights.pdf

Government of British Columbia. (2019). Making life better, first quarterly report 2019. Retrieved April 27, 2020, from Government of British Columbia website: https://www2.gov.bc.ca/assets/gov/british-columbians-our-governments/government-finances/quarterly-reports/2019-20-q1-report.pdf#page=32&zoom=100,0,0

Government of British Columbia. (2020a). Definition of "Old Growth" . Retrieved June 1, 2020, from https://engage.gov.bc.ca/oldgrowth/definition

Government of British Columbia. (2020b). NTS BC Coastline Polygons 1:250,000 - Digital Baseline Mapping (NTS) - Datasets - Data Catalogue. Retrieved May 13, 2020, from https://catalogue.data.gov.bc.ca/dataset/nts-bc-coastline-polygons-1-250-000-digital-baseline-mapping-nts

Government of British Columbia. (2020c). Sea Level - Environmental Reporting BC. Retrieved May 13, 2020, from http://www.env.gov.bc.ca/soe/indicators/climate-change/sea-level.html

Price, K., Holt, R. F., Bio, R. P., & Daust, D. (2020). *April 2020 A Last Stand for Biodiversity BC's Old Growth Forest*.

Province of British Columbia. (2020). Impacts of Climate Change. Retrieved April 10, 2020, from https://www2.gov.bc.ca/gov/content/environment/climate-change/adaptation/impacts

Talloni-Álvarez, N. E., Sumaila, R. U., Le Billon, P., & Cheung, W. W. L. (2019). Climate change impact on Canada's Pacific marine ecosystem: The current state of knowledge. *Marine Policy*, *104*, 163–176. https://doi.org/10.1016/j.marpol.2019.02.035

US Census Bureau. (2020). *Cartographic Boundary Files - Shapefile*.

Notes

[i] The government of BC's land use data may overestimate the share of old growth forest by including low productivity bog and subalpine forests; they should thus be interpreted with a note of caution (Ancient Forest Alliance, 2016). Furthermore, there is no commonly accepted definition of an old growth forest but that "most of B.C.'s coastal forests are considered to be old growth if they contain trees that are more than 250 years old. Some types of Interior forests are considered to be old growth if they contain trees that are more than 140 years old" (Government of British Columbia, 2020a). A report by Price et al. (Price, Holt, Bio, & Daust, 2020) on BC's old growth forest disaggregates old growth forest by different sizes and across different ecosystems (biogeoclimatic variants) and productivity classes. By their assessment, the vast majority (80%) of old growth forest in BC is comprised of small trees and only 3% of BC's remaining forests support large trees (Price et al., 2020).

[ii] Recently logged timber is that which was harvested within the past 20 years, or older if tree cover is less than 40% and under 6 metres in height. Selectively logged timber does not have a defined timeline, it is determined by viewing aerial imagery (areas where the practice of selective logging can be clearly interpreted on the Landsat TM image and TRIM aerial photography).

[iii] Dependency ratio calculated according to Stats Can age groups of 0-19, 19-64, and 65+.