

**Community Climate
Change Adaptation
Priorities for the
Capital Region District
2020**



Acknowledgements

This Community Climate Change Adaptation Priorities Report was developed by ICLEI Canada staff in coordination with the Capital Regional District's (CRD) Climate Action team.

The CRD would like to acknowledge ICLEI Canada for providing technical guidance throughout the project. Using ICLEI's BARC methodology, the *Together for Climate* team worked in a collaborative capacity to develop climate adaptation plans and guiding documents for seven other local governments across Vancouver Island. The CRD sought to learn from the process of the other municipalities in the CRD participating in the *Together for Climate* project – Saanich, Colwood, Esquimalt – as well as the City of Victoria through a separate project, who were going through the climate impact identification, risk and vulnerability, and action setting processes at the same time. As a result, this report offers “no regret” adaptation actions that can be taken at a community level in order to progress adaptation implementation within local governments. Throughout the initiative resources were shared across all participants, as well as successes and challenges.

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1.0 Background

The Capital Regional District (CRD) is the regional government for 13 municipalities and three electoral areas on southern Vancouver Island and the southern Gulf Islands. The CRD joined the Together for Climate project in June of 2018, which brought together 8 local and regional governments on Vancouver Island to advance climate adaptation planning. The output of the Together for Climate process has the potential to be scaled up or down, depending on the local needs and context, meaning that it can be an implementation-ready adaptation plan or a stakeholder informed guiding document that is intended to be used at a later stage to further inform future adaptation planning process. In this context, community is referring to the involvement of external partners in the planning process; this multi-stakeholder engagement model allows for climate impacts, risk and vulnerability, and solutions to be articulated and developed using a community lens – which goes beyond assessing the impacts of climate change on corporate assets.

Throughout these adaptation planning processes, participating local governments and stakeholders attended a series of workshops and meetings in order to:

- Identify locally relevant climate change impacts
- Complete organizational vulnerability and risk assessments
- Establish long-term adaptation visions and goals
- Identify relevant adaptation actions
- Develop implementation action plans

This project received two years of funding from the Real Estate Foundation of BC, and is led by ICLEI Canada, a non-profit that works with local governments across the country to build sustainable, climate-ready communities and advance climate action initiatives. In the Capital Region, the District of Saanich (Saanich), City of Colwood (Colwood), and Township of Esquimalt (Esquimalt) participated in the Together for Climate project**. ICLEI Canada also supports climate change adaptation planning for the City of Victoria (Victoria) through a unique multi-year hosting agreement.

ICLEI – Local Governments for Sustainability is a global network of more than 1,750 local and regional governments committed to sustainable urban development. Active in 100+ countries, we influence sustainability policy and drive local action for low emission, nature-based, equitable, resilient, and circular development.

Founded in 1990 as the ‘International Council for Local Environmental Initiatives’, ICLEI rebranded in 2003 to ‘ICLEI – Local Governments for Sustainability’ with a broader mandate to address all sustainability issues.

ICLEI Canada, one of 17 regional offices, works with a wide-variety of stakeholders from across government, industry, academia, and the NGO community to build more sustainable, low-carbon, energy efficient, climate-ready communities.

With a long history of innovation, creativity and collaboration in building more sustainable community, ICLEI Canada is a leader in the field of climate change and local government.

* Additional participating local and regional governments in the Together for Climate project include the communities of Courtney, Campbell River, Port Alberni, and the Cowichan Valley Regional District.

ICLEI Canada and the CRD recognized an opportunity to share the outcomes of this project beyond participating municipalities and to disseminate lessons learned throughout the region. This report synthesizes the top climate risks identified by the climate adaptation planning processes of Saanich, Colwood, Esquimalt, and Victoria and provides a series of recommendations for actions the CRD can take to improve coordination and leadership on climate adaptation initiatives across the region.

The purpose of this document is to identify actions that the CRD can lead or support that would provide fundamental inputs required to increase climate resilience for all regional local governments. It will highlight opportunities for strategic service delivery that integrate climate knowledge into planning efforts across the region. These recommendations aim to address the biggest barriers local governments face in taking action on adaptation and to provide solutions in key areas such as funding opportunities, policy development, improving knowledge and understanding of climate risks and adaptation options, and access to information.

1.1 About the CRD

The CRD is the regional government for regional government for 13 municipalities and 3 electoral areas on southern Vancouver Island and the nearby Gulf Islands, the CRD provides:

- region-wide services for all residents (e.g. regional parks, drink water, solid waste management).
- sub-regional services for two or more jurisdictions (e.g. recreation facilities).
- local decision-making and services for rural electoral areas (e.g. fire protection, building code inspections, land use planning outside the Islands Trust area).

The CRD plays a variety of important roles in supporting climate action for both the organization and throughout the region. The CRD Climate Action Service supports community and corporate climate action initiatives related to local government planning and policy support, education and capacity building, data and information research, and facilitation and coordination on projects and programs. The CRD also has a number services that support climate resilience (for example maintaining drinking water supply and waste water services, regional planning functions, regional parks, harbours, watersheds and invasive species related programs, and supporting emergency management coordination activities).

2.0 Methodology

Saanich, Colwood, Esquimalt, and Victoria have each identified climate impacts to the built, natural, and social systems in their communities using current climate projections and have conducted climate change vulnerability and risk assessments based on these impacts. These assessments demonstrate which climate impacts pose the largest risks for each municipality and inform the action-planning process.

2.1 Vulnerability Assessment

Vulnerability, or the degree to which a system is susceptible to the impacts of climate change, is a function of both sensitivity and adaptive capacity. **Sensitivity** is defined as the degree to which a system is affected by climatic conditions (e.g. temperature increases) or a specific climate change impact (e.g. increased flooding). **Adaptive capacity** is defined as the ability of built, natural, and social systems to adjust to climate change, to moderate

*Vulnerability =
Sensitivity & Adaptive Capacity*

potential damages, to take advantage of opportunities, or to cope with the consequences.

In other words, a vulnerability assessment determines the susceptibility of a population or community to climatic changes (e.g. more extreme temperatures, storm events, or sea level rise), while also measuring the preparedness of a community to respond to those changes. For example, trees may be affected by hotter and drier summers, but if most of the species are not susceptible to damage, and there is a plan in place to affordably replace those species that are susceptible to damage from heat and water stress, vulnerability is low. Conversely, a community's vulnerability to poor air quality from wildfires may be higher if there are minimal contingency measures put in place to limit the impact on human health.

Staff and key stakeholders in each community (e.g. neighbouring First Nations communities, industry, residents' associations, community organizations, etc.) were asked to review the climate impact statements they drafted based on the climate science and projections for their region, and evaluate the community's sensitivity and adaptive capacity to respond. The intent of the online vulnerability assessment was to employ a first filter to remove any impact statements that were evaluated as being very low vulnerability. Results from the vulnerability survey provide a first look at prioritizing which impacts will affect the community the most and should be addressed first in the action-planning process.

Why is this Report Important?

The CRD saw an opportunity to learn from the process of the four municipalities – Saanich, Colwood, Esquimalt, and Victoria – participating in the *Together for Climate* project who were going through the climate impact identification, risk and vulnerability, and action setting processes at the same time. The CRD wanted to be able to glean valuable information regarding community adaptation actions. ICLEI Canada, experts in climate adaptation, applied their broad knowledge in climate change adaptation, in combination with the outcomes from the *Together for Climate* project, and desktop research and personal interviews to inform the action recommendations in this report.

This report offers “no regret” adaptation actions that can be taken at a community level in order to progress adaptation implementation within local governments. The findings of this report were presented to the CRD Climate Action Inter-Municipal Working Group (IMWG) in the winter of 2020 for review and comment prior to finalizing.

2.2 Risk Assessment

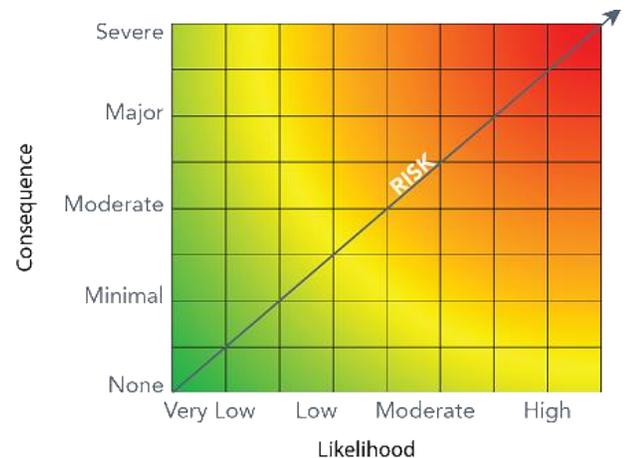
Analyzing risk is a key step in adapting to climate change and planning for a future in which the climate will be different than it is today. The results of each community’s risk assessment are based on stakeholder participation in workshops to date, additional information collected through online surveys and correspondence, interviews with experts in the region, and consultation with the Together for Climate team and municipal staff.

The outcomes from this assessment reflect the current understanding of present conditions and anticipated climate projections for the region and should be revisited every five years as climate science and the local government and community’s capacity to respond changes over time.

The risk assessment process builds upon the vulnerability assessment and is useful to further prioritize which risks are most pertinent to plan. In the risk assessment workshop, participants were asked to assess the consequences of each climate impact statement using the following 12 criteria:

Social	Economic	Environmental
Public Health & Safety	Property Damage	Air
Displacement	Local Economy & Growth	Water
Loss of Livelihood	Community Livability	Soil
Cultural Aspects	Public Administration	Ecosystem Function

Risk is a function of likelihood and consequence. A likelihood score was pre-determined for each impact statement by the project team, and participants were asked to review these scores at the workshop. The focus of this working session was to assign consequence scores for each of the social, economic, and environmental factors above to determine the overall risk score for each impact statement.



3.0 Limitations

These findings and recommendations originate from 4 of the 16 municipalities and electoral areas in the region only, and based on the Together for Climate process, and therefore are not reflective of the region as a whole. For example, the District of Highlands might score higher for wildland urban interface fire risk, and the Gulf Islands may face higher risk from drier summer conditions and impacts on water supply than other municipalities.

CRD should consider whole region impacts when prioritizing responses. Further analysis, including engagement with other regional programs (including emergency management) would be prudent.

4.0 Risk Assessment Results

The results of both the vulnerability and risk assessments inform the recommendations and actions outlined in this report. The following table demonstrates the top priority risks shared by Saanich, Esquimalt, Colwood, and Victoria that can be addressed at a regional level. These impacts were used to make recommendations and look for opportunities for the CRD to coordinate on behalf of its local governments. Note: the following table represents findings from the four area municipalities and is not an exhaustive list of climate impacts to the region but represents the findings that emerged throughout the two-year process.

Impact	Municipality	Risk Rating
Sea Level Rise		
Rising sea levels causing habitats to shift landward with risk of loss due to coastal squeeze, increased wave action, erosion, soil salinization and other stressors.	Saanich	High
Rising sea level increasing the impacts of tsunami inundation zones and risks to more properties in Saanich.	Saanich	Medium
Sea level rise and storm surges causing flooding and damage to coastal infrastructure (e.g. drainage, transportation, buildings).	Saanich	Medium
Sea level rise and more extreme weather events (e.g. storm surges, extreme rainfall and wind events) causing coastal inundation and erosion of developed and developable land (e.g. at Royal Roads University, Coburg Peninsula).	Colwood	Medium
Sea level rise inundating tourist and recreation areas, as well as local historic sites (e.g. archaeological, cultural, and spiritual sites for First Nations).	Colwood	Medium-low
Sea level rise inundating historical and culturally significant sites.	Esquimalt	Medium-low
Sea level rise and storm surges leading to temporary flooding, cause damage to coastal infrastructure (e.g. drainage, transportation, buildings) and to a lesser extent to coastal ecosystems.	Victoria	Medium-low
Heavy rainstorms and sea level rise increasing inflow and infiltration of rainwater into sanitary sewer system.	Victoria	Medium-low
Wind		
More extreme weather events causing disruption to transportation network and infrastructure.	Colwood	Medium

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Increased wind and storm events causing more deadwood for fire threat and less biomass to reduce wind impacts.	Saanich	Medium
Increase in extreme weather and high winds causing damage to infrastructure, electricity disruptions, etc.	Esquimalt	Medium
Increase in extreme weather and high winds damaging trees and coastal ecosystems.	Esquimalt	Medium-low
Increase in extreme weather and high wind events causing damage to infrastructure (e.g. damage to power lines leading to electricity disruptions).	Colwood	Medium-low
Air Quality		
Hotter, drier summers and increased wildfires causing poor air quality and impacting health (e.g. asthma-related illnesses from smoke or humidity).	Saanich	Medium-high
More frequent wildfires reducing air quality, affecting human health (e.g. respiratory issues, less exercise from decreased outdoor activity).	Colwood	Medium
Hotter and drier summers increasing PM 2.5, ground-level ozone, allergens, and smoke, leading to poor air quality.	Esquimalt	Medium
Hotter and drier summers increase PM 2.5, ground-level ozone, allergens, and smoke, leading to poor air quality and negative health impacts.	Victoria	Medium-low
Invasive Species		
Increased average temperatures and drier summers causing native species to be stressed, affecting biodiversity, and creating new opportunities for invasive species,	Saanich	High
Increased average temperatures increasing pests and diseases (e.g. winter moth), resulting in potential increase in loss of species.	Saanich	Medium
Drier summers increasing topsoil erosion, pests, and invasive species leading to higher agricultural inputs, and compromising food production potential and quality.	Saanich	Medium
Rising annual temperatures increasing prevalence of pests and invasive species.	Colwood	Medium-low
Rising annual temperatures and hotter drier summers causing native habitat loss and loss of native species (e.g. nesting bird habitat, salmonids, vegetation loss).	Colwood	Medium-low
Rising annual temperatures and extreme heat affecting native species health and biodiversity (e.g. pollinators, urban forest).	Esquimalt	Medium-low

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Rising annual temperatures and extreme heat events causing shifts in species populations and the introduction of new/invasive species and diseases.	Esquimalt	Medium-low
Increased prevalence of existing and novel invasive species as a result of changes to Victoria's climate and stress on native species.	Victoria	Medium-low
Heat		
More extreme heat events impacting at-risk populations (e.g. homeless, youth, elderly).	Colwood	Medium
More extreme weather and heat events increasing mortality and health issues, particularly for vulnerable populations (e.g. homeless, elderly, pregnant women).	Esquimalt	Medium
Increased extreme weather events (e.g. heat waves, air quality advisories, heavy rainfall, storms) affecting active transportation.	Saanich	Medium
Hotter summers increasing the risk of heat stress, especially for vulnerable populations.	Victoria	Medium
Watershed Health		
Increased average temperatures and drier summers reducing groundwater recharge and affecting water quality	Saanich	Medium-high
More frequent and intense heat waves causing warmer temperatures in streams, decreasing water quality and impacting fisheries.	Saanich	Medium-high
More frequent and intense rainfall events causing streams to be inundated, increasing erosion, sediment loads, and contaminants in water courses due to volume of storm water runoff.	Saanich	Medium
Rising annual temperatures and extreme heat events affecting water quality in the Gorge (e.g. algal blooms).	Esquimalt	Medium-low
Increased average temperatures and drier summers increasing stress on biodiversity and green infrastructure via ecological regime shifts and water shortages.	Victoria	Medium-low
Trees		
Increased drought causing increased tree mortality rate and change in urban forest composition.	Saanich	Medium-high
Rising annual temperatures and more extreme drought negatively affecting city trees.	Esquimalt	Medium
Rising annual temperatures and hotter drier summers negatively affecting urban trees.	Colwood	Medium-low

Interface Fire Risk		
Increased average temperatures and drier summers increasing wildland/interface fires in Saanich.	Saanich	Medium
Hotter and drier summers increase the risk of wildland-urban fire in the region, affecting the Township’s emergency response capacity. There is some risk to Esquimalt, but there are other regional risks that could affect Esquimalt (e.g., Saanich or Sooke Watershed).	Esquimalt	Medium-low
Hotter and drier summers increase the risk of wildland-urban interface fire in Colwood, creating direct impacts to the community. There is also risk of fires in the surrounding regions (e.g. Saanich or Sooke Watershed) that could affect the City’s emergency response capacity.	Colwood	Medium-low
Hotter and drier summers increase the risk of wildland-urban fire in the region, affecting the City’s emergency response capacity. There is some risk to Victoria, but there are other regional risks that could affect Victoria (e.g. Saanich or Sooke Watershed).	Victoria	Medium-low

Many of the risks identified through the Together for Climate risk assessment process would benefit from CRD leadership. This is because the risks are regional in nature (e.g. sea level rise) or because the CRD is the ideal entity to lead on issues that impact most or all 13 municipalities and three electoral areas that comprise the Capital Region (e.g. better understanding of extreme heat impacts on vulnerable populations).

5.0 Implementing Adaptation Actions to Address Risk

This section outlines avenues to address common challenges and risks (faced by Capital Region local governments participating in the Together for Climate project, as well as Victoria) and related outputs which regional local governments could use to guide their planning and operations decisions.

5.1 Sea Level Rise

Sea level rise will pose a variety of risks to the region, including but not limited to coastal flooding and inundation, erosion, coastal squeeze impacting habitat for birds and fish, soil salinization, damage to infrastructure, utilities and drainage systems, and impacts to cultural and historical sites. These risks are further exacerbated when combined with extreme rainfall and wind events, storm surge, subsidence, and king tides.

The CRD is already taking action towards planning for sea level rise through their Capital Region Coastal Flood Inundation Mapping Project (2020), funded by the National Disaster Mitigation Program. The resulting maps and data will be an invaluable data resource for the community to improve their ability to plan accordingly for sea level rise and coastal flooding in the region. The data must be shared widely and in an accessible way to maximize its utility.

The CRD is well situated to take a leadership role in sharing the outcomes of this project with the region, as well as supporting coordination with local governments as they integrate this data into their planning and regulation policies and tools. These maps may trigger a number of land use planning decisions that will require public support, which will need to be underpinned by a public education effort. The creation of a sea level rise education tool would be a valuable resource for local governments, as well as a wide variety of stakeholders in the community.

RECOMMENDATIONS

The following recommendations outline some actions the CRD can take to coordinate adaptation planning for sea level rise in the region:

Action 1.0 – Develop communications materials to share data and key findings from Capital Region Coastal Flood Inundation Mapping Project with local governments and the general public.

- 1.1 Create an online, public-facing sea level rise education tool to share mapping data and planning resources
- 1.2 Develop public outreach materials for use by CRD services and local governments to communicate key findings of the Project

Action 2.0 – Work with local governments to explore opportunities to integrate new sea level rise and coastal flood inundation mapping into municipal policies.

- 2.1 Review and update recommendations for adaptation measures (e.g. planning tools, regulatory tools) that can be used to address impacts from sea level rise in the *Sea Level Rise Adaptation Primer (2013)* and the *Capital Region Sea Level Rise Planning Approaches Project Report (2015)*.
- 2.2 Explore current and best practices for local governments to adapt to sea level rise and update the Literature Review in the *Capital Region Sea Level Rise Planning Approaches Project Report (2015)*.
- 2.3 Share updated information and options with local governments through written resources, training sessions or facilitated session to support consistent planning approaches (including land use policies) across the region.

Action 3.0 – Enable local governments to undertake sea level rise planning through identifying and/or providing funding opportunities.

- 3.1 – Facilitate regional grant applications to provincial and/or federal funding to provide support for local governments to coordinate on sea level rise adaptation efforts.
- 3.2 – Produce an information package of funding resources for local governments to highlight various funding mechanisms for sea level rise

planning and adaptation (e.g. DMAF, UBCM Community Preparedness Fund Flood Risk Assessment).

3.3 – Explore potential for contests or incentives to accelerate local community action.

5.1.1 Additional Resources and Good Practices

- US Climate Resilience Toolkit Sea Level Rise Viewer: Developed by the NOAA Office for Coastal Management, this tool offers access to data and information about the risks of sea level rise, storm surge, and flooding along the coastal United States, including social and economic data. The toolkit also includes training and tutorials and guidelines towards building resilience
- Public Engagement Action from Vancouver's Climate Change Adaptation Strategy 2018 Update and Action Plan: Design a competition to raise awareness and increase engagement with understanding of projections
- City of Surrey's Climate Adaptation Strategy: Development of the Regional Flood Management Strategy in coordination with senior levels of government, other municipalities, and key stakeholders
- Incorporate climate change into the City's Integrated Stormwater Management Plans (ISMPs) and other efforts to integrate land use planning and stormwater management
- Review and revise regulatory By-Laws and design standards to account for and minimize the impacts of climate change
- Update planning and development standards for floodplains

5.2 Watershed Health

The Greater Victoria Water Supply Area (GVWSA) is comprised of 20,550 hectares of natural area within the Sooke, Goldstream, and Leech watersheds. Drinking water for the GVWSA is predominately provided from the Sooke and Goldstream watersheds. Five surface reservoirs are included in this area, which provide the function of collecting and storing runoff from precipitation via inflow streams and overland flow.

Climate change poses several threats to maintaining ecological integrity and resilience within local watersheds and exacerbates existing threats. The natural hydrology of local watersheds has been altered by human development, namely, through changes in land-use which has resulted in a higher percentage of impervious surfaces in urban watersheds than natural watersheds.

The projected seasonal variability in temperature and precipitation (e.g., wetter winters, drier summers) will result in varying concerns within the region's multiple watersheds. Hotter, drier conditions during the summer months leads to issues concerning groundwater recharge and water quality; whereas, increased precipitation in the fall, winter, and spring months increases overland flow and runoff, leading to increased potential of flooding, erosion, sedimentation, and contamination (e.g., pollutants entering the watershed via overland flow). Additionally, warmer atmospheric temperatures, in conjunction with riparian habitat loss and destruction

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from human activities, is leading to increased stream temperatures, which affects aquatic habitat and fish spawning grounds. Climate change is also impacting biodiversity and species and population dynamics, potentially leading to ecological regime shifts.

Ecosystem health, functioning forests and creeks, fire protection, water conservation, clean water, and connection to place are all essential components of ensuring and fostering climate-resilient watersheds.

Esquimalt, Saanich, and Colwood also identified and prioritized risks to trees and negative impacts on the urban forest as a result of hotter, drier summers. Water filtration, slope stability, and stormwater retention may be impacted by the loss of trees. Furthermore, dead or dying trees can increase wildfire risk, which may impact water quality. Decreases in canopy cover, may also result in reduced air quality or an increased urban heat island effect.

The CRD is currently undertaking adaptation planning through the Greater Victoria Drinking Water Supply Area (GVWSA) project, where the CRD is using the mapping of ecosystems, forest characteristics, and invasive species to identify potential vulnerabilities to the projected impacts of climate change on the GVWSA. In 2018, work included undertaking a risk assessment to identify climate change impacts on water quality; expansion of weather and streamflow monitoring networks in the GVWSA; conducting a comparative analysis of how the latest climate change projections for the CRD relate to the records of climate for the water supply area over the past 100 years; and undertaking a gap analysis to identify needs for additional information required in developing a better understanding of the effects of climate change on the GVWSA.

While there is general consensus that the climate-related risks to the region's water supply are being effectively managed by the CRD, anecdotal feedback from all participating municipalities revealed that there are opportunities for the CRD to share information on watershed health and risk management with the community more broadly. A more explicit communication of the climate risks (e.g. drought, wildfire), and their existing or planned management practices would be beneficial for local governments' internal use, as well as in communication efforts with the public.

RECOMMENDATIONS

The following recommendations outline some actions the CRD can take to coordinate adaptation planning for watershed health in the region:

Action 4.0 – Share results of the Greater Victoria Water Supply Area (GVWSA) modelling with local governments and other relevant stakeholders.

Action 5.0 – Develop a public campaign to share results of the GVWSA Climate Change Adaptation Strategy once completed.

Action 6.0 – Help local governments identify optimal sites for low impact or natural/green infrastructure (particularly natural/green stormwater infrastructure) to protect watershed health.

Action 7.0 – Coordinate groups of local governments in accessing funding for projects that will improve / protect watershed health (e.g. through ecosystem-based adaptation or natural/green stormwater infrastructure).

Action 8.0 – Facilitate meetings and/or regular updates between local governments and the region for updates on any new watershed health reporting (e.g., a watershed report card), opportunities/projects for improving watershed health, and to share questions/ideas/challenges with undertaking watershed management at the local level.

Existing Actions from 2017 CRD Regional Climate Action Strategy:

Action 9.0 - Work with municipalities to create a municipal toolkit (e.g. OCPs, bylaws) to operationalize improved hydrological function and greenways.

Action 10.0 - Compile research on ecosystem shifts to include in natural area and watershed management planning for stakeholders and interested First Nations (e.g. watershed report cards).

One of the main opportunities identified in Together for Climate meetings is for the CRD to share information more broadly about managing risks to the GVWSA. The idea of a watershed report card was discussed at multiple workshops and identified as a valuable resource for both local governments and the general public.

5.2.1 Additional Resources and Good Practices

- The [Capital Regional District](#) released their **Green Stormwater Infrastructure Design Guidelines for the Capital Region** in early 2019, which includes a comprehensive overview of Green Stormwater Infrastructure (GSI), GSI design objectives, drivers, and principles, as well as an overview of climate change impacts and the implications for adaptation. Further, the Capital Regional District’s Green Stormwater Infrastructure website provides additional resources on rain gardens, green roofs, living walls, permeable paving, rainwater harvesting, erosion prevention and sediment control, bioswales, and a rainwater management tour.
- In 2014, The [City of Edmonton](#) developed their **Low Impact Development Best Management Practices Design Guide**. It provides details on LID site planning, overview of 7 LID projects implemented in the City (Rain Gardens, Bioswales, Green Roofs, Permeable Pavement, Box Planters, Naturalized Drainage Ways, Rainwater Harvesting & Re-use), LID facility design process & recommended cold weather adaptations.

- In 2011, The [City of Calgary](#) released their **Stormwater and Design Manual**, which includes a comprehensive overview of their LID and green infrastructure strategy. They have installed numerous rain gardens, permeable pavements, green roofs, bioswales, absorbent landscapes, and implemented rainwater harvesting.
- The [City of Hamilton](#) outlined the gradual adoption of LID best practices such as rain gardens, trench drains, pervious pavements, storm chambers, soak away pits, and bioswales. These practices have multiple benefits including stormwater volume control, water quality protection & improvement, reduced urban heat island effects, climate change adaptation, infrastructure savings, increased public health, and more.
- [CVC's Greening Corporate Grounds](#). Program that helps corporations, businesses, and institutions green their spaces. Their support includes a site concept plan, technical advice to landscape consultants, maintenance guidelines, assistance with planting, workshops & educational resources, program recognition, and more. This program has only been utilized by a handful of organizations and has not been applied to public property/grounds yet.
- [Assessment of Life Cycle Costs of LID Stormwater Management Practices](#). Evaluates the capital and life cycle costs of LID practices over a 50-year period based on a detailed assessment of local input costs, maintenance requirements, rehabilitation costs and design scenarios relevant to Canadian climate.
- Credit Valley Conservation (Ontario) has produced various resources that provide step-by-step guidance on how to retrofit existing properties to incorporate LID technologies, how to design the landscape for LID, how to complete a municipal stormwater management master plan, and how to conduct LID monitoring and performance assessments.
 - [Low Impact Development Road Retrofits Guide](#) to optimize infrastructure assets.
 - [Low Impact Development Public Lands Retrofits Guide](#) to optimize parks, public buildings, schools, and places of worship.
 - [Landscape Design Guide for Low Impact Development](#)
 - [Grey to Green Enhanced Stormwater Management Master Planning Guide](#) to optimize municipal infrastructure assets and reduce risk.
 - [Stormwater Management and LID Monitoring and Performance Assessment Guide](#)

5.3 Air Quality and Extreme Heat Events

Air quality has become an increasing concern for British Columbia in recent years, and Vancouver Island is experiencing a growing number of poor air quality days in the summer due to smoke from wildfires. All four CRD municipalities that assessed climate risks, identified both air quality and extreme heat events as risks to their communities, and in particular, to their vulnerable populations. These stakeholder groups also identified negative impacts to physical health and safety, mental health, outdoor work, recreation, and tourism.

Extreme heat can pose a major health risk to vulnerable populations, such as homeless populations or those living in social housing, pregnant women, children, seniors, and people with pre-existing medical conditions. It also exacerbates health issues triggered by poor air quality in populations that are more sensitive to heat impacts.

RECOMMENDATIONS

The following recommendations outline some actions the CRD can take to coordinate adaptation planning for air quality and extreme heat events in the region:

Action 11.0 – Support local governments in accessing subscriptions to air quality alerts for their geographic area.

Action 12.0 – Investigate opportunities to collaborate with Island Health, Environment Canada, the BC Centre for Disease Control, or other regional and provincial partners to determine local guidelines/parameters for heat and air quality indexes.

12.1 – Undertake research to create guidance on template/model air quality thresholds and policies for different audiences including outdoor workers, local government staff, vulnerable populations, and the public.

Action 13.0 – Develop consistent public education materials to understanding poor air quality, protecting health and safety, and shelter locations for poor air quality days.

Action 14.0 – Determine any regional facilities that can be used for refuge/hubs during poor air quality (or extending the hours of facilities that are already open) and disseminate this information to local emergency management departments.

Action 15.0 – Map (at a regional scale) the facilities/hubs/centres where residents and vulnerable populations can go for shelter and resources during extreme weather events, identify gap areas (e.g. transit inaccessible, large area without a centre), and develop options to provide additional support.

15.1 – Consider the development of a regional airshed management strategy

15.2 – Incentives for portable air cleaners (HEPA) for daycares and senior homes

15.3 – Target efforts towards vulnerable populations (health equity) (e.g. increase water fountains in neighbourhoods/areas that need it most)

15.4 – Increase the measurement of Air Quality in regions to be able to monitor better

5.3.1 Additional Resources and Good Practices:

- Cooling on site for public housing and multi-residential buildings has been identified as a recommendation in Toronto Public Health’s report “[Extreme Heat in Multi-unit Residential Buildings](#)” report and [workshop report](#).

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- Toronto Board of Health “[Protecting Vulnerable People from Health Impacts of Extreme Heat](#)” also provided recommendation for cooling rooms on site.
- Columbia University & New York Public Housing - [Energy Management in New York City Public Housing](#). Includes a feasibility study that explores the replacement of air conditioning units at New York City Housing Authority
- BC Centre for Disease Control - [Developing a Municipal Heat Response Plan: A Guide for Mediums-sized Municipalities](#). Provides recommendation of cooling rooms or AC units for social housing.
- The [Ontario Ministry of Labour](#) provides guidelines for workers and employers to help them understand heat stress, and develop and implement workplace policies to prevent heat-stress-related illness. Outlines various controls, including engineering controls, administrative controls, etc.
- Government of Alberta – [Best Practices for Working Safely in the Heat and Cold](#). Outlines health risks associated with working in extreme heat and cold situations, and to suggest reasonable solutions for workplaces.
- International Bar Association and the Global Employment Institute - [Climate Change and Human Resources Policies Report](#). Outputs of an international survey to company representatives and employment lawmakers that outlines HR policy responses to climate change challenges.
- Ontario College of Family Physicians - [Health Effects of Climate Change](#). Supports the argument for why climate change is a threat to human health.
- EPA – [Climate Change and the Health of Occupational Groups](#). Quick fact sheet that outlines why climate change is a threat to human health, with a focus on outdoor workers.

5.4 Invasive Species

There are a variety of climate impact statements from all 4 municipalities that identify risks to the natural and built environment, and human health as a result of invasive species. There is a general understanding that changing climate conditions will increase the prevalence of invasive species, while simultaneously decreasing the survivability of native species, but it is not known exactly what species will be affected and where these changes are expected to occur. The multiple issues created by invasive species are compounded by climate change. Climate change facilitates the spread and establishment of many alien species and creates new opportunities for them to become invasive. Invasive species can reduce the resilience of natural habitats, agricultural systems, and urban areas to climate change. Conversely, climate change reduces the resilience of habitats to biological invasions.

It is essential that invasive species be incorporated into climate change adaptation discussions and policies. This includes biosecurity measures to prevent the introduction of invasive species to new regions as a result of climate change, and rapid response measures to monitor and eradicate alien species that may become invasive due to climate change.

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The CRD is currently coordinating action on invasive species through the Regional Invasive Species Program (RISP), but the ability to plan more specifically for future invasive species regimes would benefit all local governments in the region.

RECOMMENDATIONS

The following recommendations outline some actions the CRD can take to coordinate adaptation planning for invasive species in the region:

Action 16.0 – Replicate the 2016 study [Using Risk Assessment and Habitat Suitability Models to Prioritise Invasive Species for Management in a Changing Climate](#) or develop a similar methodology to assess the impacts of future climatic changes on species in the region.

- 16.1 Share and engage local governments about the study's findings of priority areas/habitats across the region, and priority invasive species to watch for and options for management.

Action 17.0 – Continue to support a collaborative approach to invasive species management across the region (e.g. CRISP intergovernmental working group, programs and policies involving neighbouring municipalities) focused on prevention of new arrival of invasive species and early detection and rapid response for high priority species.

- 17.1 Support and encourage mapping of invasive and native species
- 17.2 Support a comprehensive program of research and outreach on invasive species and climate change in the capital region
- 17.3 Develop and share natural areas management guidelines for both local governments and homeowners more resilient to future climate conditions (drought resistant, adaptable)
- 17.4 Investigate bulk purchasing program of native species with other municipalities
- 17.5 Plan for coordinated training for staff of different local governments about invasive species and climate change

Action 18.0 – Update public education materials for identifying, monitoring, and reporting invasive species through a climate lens.

- 18.1 Work with the CRISP to share integrated climate and invasive species messaging
- 18.2 Develop guidelines for management of natural areas on public land and home gardening that could help minimize the spread of invasive species and build climate resilience.

5.4.1 Additional Resources and Good Practices

- Forest Ontario – [Discussion Paper: Alternate Approaches to Afforestation](#). Provides case studies and details regarding the strategic planting of trees to achieve increased naturalization, biodiversity, resilience to pests, etc.
- Protecting natural heritage assets and greenspace has been recommended in numerous Canadian local adaptation plans, including [Thunder Bay](#), [Surrey’s Climate Change Adaptation Plan](#), etc.
- Government of Ontario - [2014 Provincial Policy Statement](#). Affirms that the diversity and connectivity of natural heritage systems should be enhanced or restored where feasible.
- Government of Ontario - [2017 Greenbelt Plan](#). The document “gives permanent protection to the natural heritage and water resource systems that sustain ecological and human health.”
- Green Infrastructure Ontario - [Health, Prosperity and Sustainability: The Case for Green Infrastructure in Ontario](#). Lays out multiple Ontario Policy support tools for Green Infrastructure, and other supporting documents including cost-benefit studies and ecosystem service valuations.
- City of Toronto - [Tree Planting Solutions in Hard Boulevard Surfaces Best Practices Manual](#). This manual examines and provides cost-efficient options to increase both the number and size of street tree plantings along streets and boulevards.

5.5 Wind

Wind was identified as a top-priority risk by all Together for Climate municipalities and considered impacts to both the built and natural environment. Wind exacerbates the impacts of other climatic factors such as extreme rainfall events or flooding and wildfire. It is generally accepted that wind events will become more intense as the climate continues to change, but it is more severe storm events that can also cause issues for ecosystems and species. Within the capital region, wind has been known to cause sustained power outages. Flooding of lowland areas in the fall, winter, and spring months can result in tree roots becoming saturated, stressing trees and potentially making them more susceptible to being damaged or blown down by strong winds.

RECOMMENDATIONS

The following recommendations outline some actions the CRD can take to coordinate adaptation planning for wind in the region:

Action 19.0 – Work with the Pacific Climate Impacts Consortium to understand the opportunity to pursue a study to determine future wind projections for the region.

Action 20.0 – Develop and/or update wind speed thresholds and policies for outdoor workers and share with local governments.

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Action 21.0 – Support municipalities in integrating wind-related risks and compounding impacts of wind (e.g. poor air quality + strong winds) into Emergency Management, Health and Safety, and Communications/Engagement operations.

Action 22.0 – Utilizing existing emergency response networks among local governments, to share current challenges, new data, and emerging best practices in adapting to wind-related risks.

5.5.1 Additional Resources and Good Practices

- EPA - [Power Resilience – A guide for water and wastewater utilities](#). Includes information from water industry professionals on how to increase power resilience in disasters.
- [City of Toronto - Minimum Backup Power for Multi-Unit Residential Buildings. Report on how to](#) improve resilience to area-wide power outages in multi-unit residential buildings in the City of Toronto, both existing and new.
- City of Toronto - [Backup Power Module for Updated Community Energy Plans](#). The purpose of this study was to identify opportunities to improve standby power systems in existing and new Multi-Unit Residential Buildings.

5.6 Enabling Actions

Adaptation is not a one-off effort but requires building the capacity within a given organization and community to continue learning, collaborating, and innovating over many years. Beyond both technical and awareness raising actions, organizational and governance actions can be crucial to supporting meaningful action on climate change. Embedding these types of considerations will make climate resilience actions more likely to drive systematic change and move towards success in the long-term.

The CRD is well-poised to build capacity across the region in response to local climate impacts by providing and developing templates, resources, and guidelines for local governments in the Capital Region to use in taking steps to integrate enabling actions into their operations and organizational procedures. Furthermore, the CRD can provide a platform for local governments to share knowledge and lessons learned on implementation of these enabling actions.

The recommended enabling actions specific to the risks outlined through the Together for Climate process fall into four broad themes:

- Establishing Regional/Local Financing Mechanisms
- Providing Policy Recommendations
- Commissioning Research and Data Collection
- Supporting Public Education

Establishing Regional/Local Financing Mechanisms

Adaptation actions range in cost, and local governments can benefit from using a variety of financing mechanisms to help them advance implementation. Financing tools can include group purchasing, green bonds, grants and bursary programs, and incentive programs. ICLEI Canada conducted a [study](#) in 2016 with local governments and practitioners to identify critical barriers municipalities face to implementing adaptation actions, and lack of human and financial resources was a key finding. Recommendations focus on funding opportunities the CRD could consider to support municipalities in addressing their priority risks.

Specific actions under this theme that are recommended include:

ENABLING ACTIONS

Enabling Actions are initiatives that are required to build capacity and foster continued integration and monitoring of adaptation into daily business and decision-making. In other words - not just the “what” but also the “how” - institutionalizing the capacity to do adaptation planning. Some examples of enabling actions include, but are not limited, to the following:

- Developing criteria that include climate change considerations into purchasing decisions;
- Incorporating a scan of major projects against hazard and risk mapping to identify when risk experts should be involved early in a project;
- Developing financial mechanisms to provide stable funding for climate action (e.g., revolving green funds, green bonds); and
- Making climate projections widely available across the city. Increasing knowledge and engaging staff with respect to other climate projections and tools that would be useful.

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Action 23.0 – Investigate and seek opportunities to support climate risk assessments in remaining local governments (and potentially First Nations) within the region.

- 23.1 Explore funding options to hire a climate adaptation specialist within the CRD to support each local government in developing a climate adaptation plan.

ICLEI Canada’s resource [*Making Strides on Community Adaptation in Canada* \(2016\)](#) is a helpful resource with recommendations for effective adaption action implementation.

The CRD produces a lot of useful knowledge and information that local governments can use to prepare their communities for a changing climate. Regional stakeholders will continually need support in interpreting this information to integrate into their own decision-making processes.

Providing Policy Recommendations and Technical Support

As many adaptation-related policies require action from multiple departments, sectors, and stakeholders, it can be difficult to identify and develop the appropriate policy mechanisms.

Local governments are still working to determine how best to integrate climate change considerations into policies and operations, and support from regional partners would provide helpful insights and tools for moving forward. Where applicable, actions have been recommended to work with municipalities to draft model bylaws or policies they can utilize to further climate adaptation efforts.

Specific actions under this theme that are recommended include:

Action 24.0 – Continue to facilitate collaboration across local governments focusing on adaptation or resilience. Many of the risks above are transboundary (e.g. wind, invasive species, air quality, etc.). A coordinated approach where local governments can share information, resources, policies/programs will be more effective and would benefit from economies of scale.

Action 25.0 – Provide training to local government staff on identifying local impacts and assessing risks across sectors in the community to repeat training in their own communities (train the trainer).

- 25.1 Create supporting resources, such as a “workshop-in-a-box”, to aid local governments in building capacity and climate literacy within their own staff and communities along the themes of the trainings to be provided.

Commissioning Research and Data Collection

Local climate impacts are incredibly complex and occur differently across varying geographies and timescales. Many of the priority impacts identified by municipalities (such as watershed health) require further research to determine the details about the climatic changes that will affect water supply, growing conditions, individual species, natural areas, infrastructure, and demographics. ICLEI Canada's *Making Strides on Community Adaptation in Canada (2016)* report identifies "difficulty accessing relevant resources and best practice documentation" as a key barrier to municipalities implementing climate adaptation actions. Recommendations for the CRD include deeper investigation of climate impacts of topics stated above (e.g., water supply, growing conditions, individual species, natural areas, infrastructure, and demographics) that will have a widespread effect on local governments, in hope that more information can assist with future decision-making in each community.

The CRD has an important knowledge-management role to play in developing a robust understanding of regional climate change issues and opportunities. Many community partners and thought-leaders are spearheading studies, measuring data and reporting on changes as they occur. The CRD can continue to play a central role in collecting, mapping, and sharing this information with other partners as the region works together towards climate adaptation. The CRD has a unique opportunity to support the region in public engagement and can reduce redundancies by creating educational tools that can be utilized by all municipalities.

Specific actions under this theme that are recommended include:

Action 26.0 – Produce a template to use every time a climate change related study or report is released by the CRD that provides municipalities with information on opportunities for funding, policy recommendations, further research, and ideas for public engagement.

Supporting Public Education

Communities need to find creative ways to engage and educate the residents, local businesses, and vulnerable groups about climate and extreme weather risks and support them in identifying steps they can take to reduce risks to their community. Through community education on climate change, local governments have the opportunity to address interconnected issues of equity, health, and well-being. This plan includes recommendations to the CRD to develop templates and materials for public education around the priority impacts facing their local governments. Priority should be given to ensuring groups that are most vulnerable to climate risks are receiving resources that can help build their adaptive capacity.

The CRD supports citizens in reducing risk from climate impacts via a number of roles: inter-municipal coordination and planning support, management of regional water, sewer and waste infrastructure, and emergency management and regional emergency preparedness coordination. Additionally, the CRD plays a critical role in preparing citizens by providing information on climate change and working with partners to provide programs that help citizens anticipate and take action to prepare for changes ahead. The CRD can also influence the

well-being of citizens in the jurisdiction where it acts as a local authority and by ensuring infrastructure is prepared for incremental changes and extreme events over its useful lifetime.

Action 27.0 – Connect local governments to multi-stakeholder groups and agencies that cross municipal boundaries (e.g. faith groups, agriculture community, environmental groups, post-secondary institutions, school boards, First Nations) to build capacity on assessing the local impacts of climate change and determining the best ways to address and prioritize the local impacts.

6.0 Monitoring and Evaluation

Ongoing evaluation and monitoring are key to understanding the efficacy of adaptation actions. As local climatic risks change over time due to both the dynamic and complex nature of climate change and due to system responses to ongoing and current adaptation actions, a long-term and sustainable approach to monitoring and evaluation is required. The following presents a 5-Step framework that could be used by the CRD to integrate monitoring and evaluation into broader adaptation decision making (the framework has been adapted from the work of the federal created Expert Panel of Climate Change Adaptation and Resilience Results).

Step One: Develop/ Refine Indicators

- Indicators can be both process and outcome based, the former devoted to gauging steps toward building capacity and measuring progress on implementation; while outcome indicators seek direct lines of evidence to support a cause-effect relationship
- Indicators should meet a variety of criteria – practical, meaningful, designed to drive behaviour change
- Should consider that the breadth of the indicator suite adequately measures change in actions to adapt to climate change impacts

Step Two: Collect Data

- Need to identify baseline data requirements – what information is needed to measure a change
- Where is data already being collected and where can this be shared and/or accessed? Are there existing reporting bodies or reporting hierarchies that can help with data collection?
- Need to ensure a transparent and defensible level of data quality at this stage

Step Three: Data Analysis and Evaluation

- Analysis should centre around identifying upward or downward trends
- Formats for analysis, evaluation and reporting should be considered at this stage and the diversity of audiences should also be considered (i.e. technical versus lay, decision-makers versus informational, etc.)
- Where possible, statistical techniques should be applied; however, the relative novelty and complexity of institutional resilience as a concept and field of practice could pose a challenge to represent it through statistical analysis

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Step Four: Communicate Results

- Communication between data holders, data users, and decision-makers is integral throughout the performance measurement process
- Important to communicate results at a variety of scales – project, program, whole of government – as well as in a variety of mechanisms
- Effective communications can spur course corrections, encourage further behaviour, advancing financing mechanisms through demonstrated results

Step Five: Continually Improve

- Monitoring and evaluation is not an end but rather a means towards improved and enhanced decision-making
- Timelines for process improvements may fluctuate, but monitoring data should be included into existing frameworks for evaluation and decision-making as broadly as possible

7.0 Sources

- Bodtker, K.M., Pellatt, M.G., Cannon, A.J. (2009). *A bioclimatic model to assess to assess the impact of climate change on ecosystems at risk* (CCAF Project A718). Report for the Climate Change Impacts and Adaptation Directorate. Vancouver, Canada: Parks Canada Agency.
- Capital Regional District. (2015). *Capital Region Sea Level Rise Planning Approaches Project Report*. Victoria, BC. Retrieved from https://www.crd.bc.ca/docs/default-source/climate-action-pdf/reports/sea-level-rise-planning-approaches-project-report.pdf?sfvrsn=d29757ca_0
- Capital Regional District. (2017). *Taking Action on Climate Change - Capital Regional District Regional Climate Action Strategy*. Victoria, BC. Retrieved from https://www.crd.bc.ca/docs/default-source/crd-document-library/plans-reports/climate/2017-04-12_regionalclimateactionstrategy_final.pdf?sfvrsn=da2e32ca_18
- Capital Regional District. (2018). *Capital Regional District 2018 Climate Action Annual Report*. Victoria, BC. Retrieved from https://www.crd.bc.ca/docs/default-source/crd-document-library/plans-reports/climate/2018-reports/crd-climate-action-2018-annual-report.pdf?sfvrsn=4e20dbca_4
- Garry Oak Ecosystem Recovery Team. (2012). Chapter 9: Alien Invasive Species. In M. Gorman, A. Pelletier, D. Polster, & R. Prasad (Eds.), *Restoring British Columbia's Garry Oak Ecosystems: Principles and Practices*. Victoria, BC.
- Hobbs, R., Higgs, E., Hall, C., Bridgewater, P., Chapin, F., Ellis, E., ... Yung, L. (2014). Managing the whole landscape: Historical, hybrid, and novel ecosystems. *Frontiers in Ecology and the Environment*, 12(10), 557-564. doi:10.1890/130300
- ICLEI Canada. (2016). *Making Strides on Community Adaptation in Canada*. Retrieved from <https://icleicanada.org/wp-content/uploads/2019/07/Making-Strides-on-Community-Adaptation.pdf>
- Pellatt, M.G., Goring, S.J., Bodtker, K.M., Cannon, A.J. (2012). Using a down-scaled bioclimate envelope model to determine long-term temporal connectivity of Garry oak (*Quercus garryana*) habitat in western North

8.0 Appendices

Appendix A: Summary of Adaptation Actions

ACTION NUMBER	ACTION NAME
SEA LEVEL RISE	
1.0	Develop communications materials to share data and key findings from Capital Region Coastal Flood Inundation Mapping Project with local governments and the general public.
1.1	Create an online, public-facing sea level rise education tool to share mapping data and planning resources.
1.2	Develop public outreach materials for use by CRD services and local governments to communicate key findings of the Project.
2.0	Work with local governments to explore opportunities to integrate new sea level rise and coastal flood inundation mapping into municipal policies.
2.1	Review and update recommendations for adaptation measures (e.g. planning tools, regulatory tools) that can be used to address impacts from sea level rise in the <i>Sea Level Rise Adaptation Primer (2013)</i> and the <i>Capital Region Sea Level Rise Planning Approaches Project Report (2015)</i> .
2.2	Explore current and best practices for local governments to adapt to sea level rise and update the Literature Review in the <i>Capital Region Sea Level Rise Planning Approaches Project Report (2015)</i> .
2.3	Share updated information and options with local governments through written resources, training sessions or facilitated session to support consistent planning approaches (including land use policies) across the region.
3.0	Enable local governments to undertake sea level rise planning through identifying and/or providing funding opportunities.
3.1	Facilitate regional grant applications to provincial and/or federal funding to provide support for local governments to coordinate on sea level rise adaptation efforts.
3.2	Produce an information package of funding resources for local governments to highlight various funding mechanisms for sea level rise planning and adaptation (e.g. DMAF, UBCM Community Preparedness Fund Flood Risk Assessment).
3.3	Explore potential for contests or incentives to accelerate local community action.

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WATERSHED HEALTH	
4.0	Share results of the Greater Victoria Water Supply Area (GVWSA) modelling with local governments and other relevant stakeholders.
5.0	Develop a public campaign to share results of the GVWSA Climate Change Adaptation Strategy once completed.
6.0	Help local governments identify optimal sites for low impact or natural/green infrastructure (particularly natural/green stormwater infrastructure) to protect watershed health.
7.0	Coordinate groups of local governments in accessing funding for projects that will improve / protect watershed health (e.g. through ecosystem-based adaptation or natural/green stormwater infrastructure).
8.0	Facilitate meetings and/or regular updates between local governments and the region for updates on any new watershed health reporting (e.g., a watershed report card), opportunities/projects for improving watershed health, and to share questions/ideas/challenges with undertaking watershed management at the local level.
9.0	Work with municipalities to create a municipal toolkit (e.g. OCPs, bylaws) to operationalize improved hydrological function and greenways.
10.0	Compile research on ecosystem shifts to include in natural area and watershed management planning for stakeholders and interested First Nations (e.g. watershed report cards).
AIR QUALITY AND EXTREME HEAT EVENTS	
11.0	Support local governments in accessing subscriptions to air quality alerts for their geographic area.
12.0	Investigate opportunities to collaborate with Island Health, Environment Canada, the BC Centre for Disease Control, or other regional and provincial partners to determine local guidelines/parameters for heat and air quality indexes.
12.1	Undertake research to create guidance on template/model air quality thresholds and policies for different audiences including outdoor workers, local government staff, vulnerable populations, and the public.
13.0	Develop consistent public education materials to understanding poor air quality, protecting health and safety, and shelter locations for poor air quality days.
14.0	Determine any regional facilities that can be used for refuge/hubs during poor air quality (or extending the hours of facilitates that are already open) and disseminate this information to local emergency management departments.
15.0	Map (at a regional scale) the facilities/hubs/centres where residents and vulnerable populations can go for shelter and resources during extreme weather events, identify gap areas (e.g. transit inaccessible, large area without a centre), and develop options to provide additional support.
15.1	Consider the development of a regional airshed management strategy

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15.2	Incentives for portable air cleaners (HEPA) for daycares and senior homes
15.3	Target efforts towards vulnerable populations (health equity) (e.g. increase water fountains in neighbourhoods/areas that need it most)
15.4	Increase the measurement of Air Quality in regions to be able to monitor better
INVASIVE SPECIES	
16.0	Replicate the 2016 study <i>Using Risk Assessment and Habitat Suitability Models to Prioritise Invasive Species for Management in a Changing Climate</i> or develop a similar methodology to assess the impacts of future climatic changes on species in the region.
16.1	Share and engage local governments about the study's findings of priority areas/habitats across the region, and priority invasive species to watch for and options for management.
17.0	Continue to support a collaborative approach to invasive species management across the region (e.g. CRISP intergovernmental working group, programs and policies involving neighbouring municipalities) focussed on prevention of new arrival of invasive species and early detection and rapid response for high priority species.
17.1	Support and encourage mapping of invasive and native species
17.2	Support a comprehensive program of research and outreach on invasive species and climate change in the capital region
17.3	Develop and share natural areas management guidelines for both local governments and homeowners more resilient to future climate conditions (drought resistant, adaptable)
17.4	Investigate bulk purchasing program of native species with other municipalities
17.5	Plan for coordinated training for staff of different local governments about invasive species and climate change
18.0	Update public education materials for identifying, monitoring, and reporting invasive species through a climate lens.
18.1	Work with CRISP to share integrated climate and invasive species messaging
18.2	Develop guidelines for management of natural areas on public land and home gardening that could help minimize the spread of invasive species and build climate resilience.

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WIND	
19.0	Work with the Pacific Climate Impacts Consortium to understand the opportunity to pursue a study to determine future wind projections for the region.
20.0	Develop and/or update wind speed thresholds and policies for outdoor workers and share with local governments.
21.0	Support municipalities in integrating wind-related risks and compounding impacts of wind (e.g. poor air quality + strong winds) into Emergency Management, Health and Safety, and Communications/Engagement operations.
22.0	Utilizing existing emergency response networks among local governments, to share current challenges, new data, and emerging best practices in adapting to wind-related risks.
ENABLING	
23.0	Investigate and seek opportunities to support climate risk assessments in remaining local governments (and potentially First Nations) within the region.
23.1	Explore funding options to hire a climate adaptation specialist within the CRD to support each local government in developing a climate adaptation plan.
24.0	Continue to facilitate collaboration across local governments focusing on adaptation or resilience. Many of the risks above are transboundary (e.g. wind, invasive species, air quality, etc.). A coordinated approach where local governments can share information, resources, policies/programs will be more effective and would benefit from economies of scale.
25.0	Provide training to local government staff on identifying local impacts and assessing risks across sectors in the community to repeat training in their own communities (train the trainer).
25.1	Create supporting resources, such as a “workshop-in-a-box”, to aid local governments in building capacity and climate literacy within their own staff and communities along the themes of the trainings to be provided.
26.0	Produce a template to use every time a climate change related study or report is released by the CRD that provides municipalities with information on opportunities for funding, policy recommendations, further research, and ideas for public engagement.
27.0	Connect local governments to multi-stakeholder groups and agencies that cross municipal boundaries (e.g. faith groups, agriculture community, environmental groups, post-secondary institutions, school boards, First Nations) to build capacity on assessing the local impacts of climate change and determining the best ways to address and prioritize the local impacts.