

Climate Resilience on the Pacific Coast: Framework for Collaborative Action

March 2021



In the 2018 *Pacific Coast Collaborative (PCC) Declaration on Climate Resilience*, the state and provincial partners of the PCC committed to a shared vision of climate resilience across the Pacific Coast region. This vision is shared with PCC city partners who are leaders in climate resilience in North America. Through coordinated knowledge exchange, strategic planning, and collaborative implementation, PCC partners are committed to establishing the region as a model of innovation that fosters resilience in the face of a changing climate, sustains thriving communities, fosters equity, and creates jobs and new economic opportunities.

This framework for collaborative action builds on the PCC Declaration on Climate Resilience and charts an implementation roadmap to spur new coordinated work among PCC and other regional partners to add value effectively and efficiently to climate resilience initiatives. Through this work, PCC partners seek to strengthen our collective impact and reduce overlap and duplication to achieve shared objectives.

This framework was developed amid the crisis of COVID-19, and it is being released during the process of ongoing management and recovery. The crisis highlights the need to build regional resilience. It also creates a new suite of challenges for resilience—as well as potential openings for change—as we recover from the economic and social impacts of the pandemic. Understanding these challenges and opportunities will evolve over time (and are beyond the scope of this framework). We recognize that this crisis may influence the approach we take but not the goals we have in common.

ABOUT THE PACIFIC COAST COLLABORATIVE

The Pacific Coast of North America represents the world's fifth largest economy, a thriving region of 55 million people with a combined GDP of \$3 trillion. Through the Pacific Coast Collaborative (PCC), British Columbia, Washington, Oregon, California, and the cities of Vancouver B.C., Seattle, Portland, San Francisco, Oakland, and Los Angeles are working together to build the low carbon and resilient economy of the future.

REGIONAL CLIMATE RESILIENCE GOALS AND FOCUS

The PCC understands “**climate resilience**” as the capacity for social, economic, and environmental systems to prepare for and address disruption, recover from shocks and stresses, and thrive and succeed in a changing climate. We recognize that the challenges and opportunities posed by a changing climate extend across the natural and built environments of our region, as well as the social fabric that knits our communities together. As leaders of climate change adaptation and mitigation, the PCC partner states, province, and cities will confront these challenges and opportunities with innovative and united efforts.

Together, the PCC strives to achieve the following goals described in the *Declaration on Climate Resilience*:¹

- Safe, self-reliant, sustainable, and prosperous communities across the Pacific Coast
- Low-carbon infrastructure and energy systems that reduce emissions and support the region's long-term resilience and prosperity
- New investments at the scale necessary to prepare our critical infrastructure and natural resources for existing and future climate-induced disasters and threats, including wildfire, changing ocean conditions, and flooding
- Actions to ensure our most vulnerable and disadvantaged populations are equipped to thrive in a climate-impacted world
- Support for states, provinces, cities, and local communities to plan, adapt, and thrive under a changing climate

To operationalize these goals, the PCC committed to identify successful programs and approaches that lead to enhanced resilience outcomes, with a particular emphasis on issues of regional importance, including:

- Natural disaster preparation and response coordination;
- Fire prevention and management strategies;
- Ocean acidification and coastal adaptation measures;
- Water management and drought preparedness strategies;
- Enhancing resilience of species, ecosystems, natural and working lands and shorelines;
- Public health and community resilience;
- Prudent financial risk management of public funds; and
- Development of reliable, resilient, and affordable energy and transportation systems and infrastructure.

NEAR-TERM PRIORITIES FOR REGIONAL CLIMATE RESILIENCE ACTION

Based on our shared goals and commitment to collaboration, over the next 1-2 years the PCC partners will focus regional collaboration on the five areas described below. These areas reflect shared priorities among PCC partners and an assessment of where there is greatest opportunity for regional collaboration and to enhance regional and local capacity to identify and implement adaptive strategies. This list is not meant to exclude other areas of climate resilience on which some or all PCC partners may collaborate in the coming years or suggest a shift in jurisdictions' priorities on climate resilience.

1. Mainstream climate resilience in public processes and decisions: Develop a framework, actionable steps, and accountability strategies for mainstreaming consideration of climate resilience into core state, provincial, and city planning and decision-making. This includes, but is not limited to, adopting methods to integrate climate risk into asset planning and investment decisions about publicly-owned infrastructure (e.g., roads, buildings) and in planning. As an initial product, the PCC will create a checklist of climate resilience considerations that should be considered as part of the scoping process for significant asset decisions.

2. Forest health, including wildfires: Assess regional gaps and opportunities for enhanced regional coordination of forest management and coordinated response to fire and other natural disasters. This work recognizes and

¹ PCC Declaration on Climate Resilience, 2018: https://46h83069gmc37jdhm425hbh3-wpengine.netdna-ssl.com/wp-content/uploads/2018/09/PCC_Climate_Resilience_Declaration_FINAL-forweb.pdf

applauds the regional *Memorandum of Understanding (MOU) on Pacific Coast Temperate Forests* and ongoing actions to implement it (see page 9 for more information on the MOU).

3. Natural and working lands and shorelines: Share and develop tools and methods for measuring carbon sequestration potential from natural and working lands, including forests as well as aquatic and marine ecosystems. Share lessons and practices about programs and policies for building resilience of natural and working lands as climate mitigation and resilience strategies.

4. Innovative financing, investment, and insurance for climate resilience. Identify and work to implement strategies to mobilize public and private resources to increase infrastructure resilience through investments in modern, low carbon and climate resilient natural and built infrastructure across the region. This includes innovative financing (e.g., green bonds), procurement, and insurance.

5. Studies to understand the business case for climate resilience. Jointly invest in and undertake analysis to build regional understanding of the likelihood and potential cost of regionally specific climate risks as well as the near-term and long-term benefits of action.

Our work together in these five areas will reflect the specific collaborative opportunities highlighted in the *Declaration on Climate Resilience*:

- **Tools, policies, and programs:** Identification and sharing of existing tools, programs, and policies that could be scaled/applied and/or replicated across the region to advance climate resilience.
- **Integration into policy and planning:** Recommendations for integration of adaptation and resilience into key strategic planning documents and policies where such integration is not already occurring (e.g. new building codes, energy and land use system planning, forest and public lands management, coastal and marine resource planning and management etc.)
- **Disaster response and coordination:** Recommendations for enhanced natural disaster response and coordination efforts.
- **Increased public and private investment:** Recommendations on strategies and approaches to mobilize public and private resources to increase infrastructure resilience, including innovative financing and procurement approaches to accelerate investment in modern, low carbon, and climate resilient natural and built infrastructure across the region, leveraging successful examples and models.
- **Climate resilience accounting:** Recommendations on better coordinating approaches to full lifecycle cost accounting for infrastructure investments and improvements across the region that considers financial, social, health, environmental and climate mitigation and resilience impacts.
- **Climate impact studies:** Recommendations on studies on the impacts of climate and ocean change at local community levels.

The table below indicates how the five priority areas of work correspond to the collaboration opportunities above.

PCC Priority Areas of Work	Climate Resilience Declaration Collaboration Opportunities					
	Tools, policies, and programs	Integration into policy and planning	Disaster response and coordination	Increased public and private investment	Climate resilience accounting	Climate impact studies
1. Mainstream Climate Resilience in Public Processes		X			X	
2. Forest Health, including Wildfires	X		X			

PCC Priority Areas of Work	Climate Resilience Declaration Collaboration Opportunities					
	Tools, policies, and programs	Integration into policy and planning	Disaster response and coordination	Increased public and private investment	Climate resilience accounting	Climate impact studies
3. Natural and Working Lands and Shorelines	X	X				
4. Innovative Financing, Investment, and Insurance for Climate Resilience				X		
5. Studies to inform Business Case for Climate Resilience	X					X

SHARED UNDERSTANDING OF KEY TERMS

While each PCC partner may have its own official definitions of climate resilience terms, there is a shared understanding of key concepts to facilitate joint work:

Adaptation: An adjustment in natural or human systems to a new and changing environment in response to actual or expected climatic stimuli or their effects, which reduces harm or increases benefits from positive opportunities for action.

Risk Mitigation: The reduction or elimination of potential adverse impacts of hazards, like damage to life, property, and resources, among others, through plans and actions that reduce risk.

Climate Mitigation: A human intervention to reduce the source of substances that may contribute directly or indirectly to climate change or enhance sinks that sequester greenhouse gases.

Community Vulnerability: The degree to which natural, built, and human systems are at risk of exposure to climate change impacts. Vulnerable communities experience heightened risk and increased sensitivity to climate change and have less capacity and fewer resources to cope with, adapt to, or recover from climate impacts. These disproportionate effects are caused by physical (built and environmental), social, political, and/or economic factor(s), which are exacerbated by climate impacts. These factors include, but are not limited to, race, class, sexual orientation and identification, national origin, and income inequality. The PCC partners recognize that our collective understanding of the causes of community vulnerability and solutions to increase climate resilience are evolving.

CLIMATE IMPACTS OF SIGNIFICANCE TO THE REGION

From the southern coasts of California to the northern mountains of British Columbia, today’s climate and ocean are different than 30 years ago. The climate seen today is also different than the climate that will be seen 30 years from now. But one thing is certain, climate change is impacting every corner of the region.

While climate impacts are inherently local, based on the specific geography and coastline conditions of a place, there are commonalities in how these impacts manifest across the Pacific Coast region. For example, a community in California may experience drought differently from a community in Washington, but the impacts will also be felt across the region. Further, many of the solutions to addressing local climate impacts are regional in nature given the interconnections across our natural, built, and social systems.

Generally, climate models suggest that across the region, temperatures will continue to increase over the coming decades. Snowpack across the western United States has also begun to shrink and will continue to decline. While there may not be a change to overall annual precipitation across the region, how and when that precipitation takes place is expected to shift significantly. For example, the region's precipitation regime may be characterized by greater swings between extreme wet and dry periods even though the overall change may not be significant. While there is some variation along the Pacific Coast, all coastal communities will face ocean waters continuing to acidify, warm and lose oxygen, and they will be impacted by sea level rise this century.

Key climate impacts that will continue to significantly affect our region are:

- **Wildfire** – California, Oregon, Washington and British Columbia have all experienced record-breaking wildfire seasons in recent years. The intensity of these fires and the areas impacted by them are expected to rise if current warming trends continue. Wildfires can damage homes, businesses and infrastructure, have negative impacts on both physical and mental health, impact drinking water quality, and damage forest industries.
- **Flooding** – Sea-level rise, intense coastal storm events, and increased precipitation events all lead to increased flood risk in many areas of the Pacific Coast. Flooding can cause serious damage to infrastructure, impact the health and safety of residents, and lead to high economic losses.
- **Drought** – Increasing temperatures and shifting precipitation patterns can lead to drought conditions, causing water shortages with negative impacts on ecosystems; water quality and human health; and economic loss across a diversity of sectors, including agriculture. There are also impacts of cultural harvesting and subsistence practices when species, like salmon, are impacted by low water levels.
- **Extreme Heat** – Increased heat poses risks to human health, with heat-related illness and death the leading cause of natural disaster-related deaths in the United States. Extreme heat decreases productivity and drives economic loss. It impacts air quality ecosystems, including ocean heat waves.
- **Ocean Acidification** – Carbon dioxide from burning fossil fuels changes the chemistry of our oceans. This impacts the ability of marine creatures to build strong shells, and shell damage can occur with increases in acidity. Waters off the Pacific Coast are acidifying at a much faster rate than anywhere else in the world. This can affect marine food webs and impact food security, including aquaculture, fishing industries, and even harvesting for sustenance or ceremonial purposes, which is important for tribal and Indigenous communities across the region.

LEARN MORE ABOUT EXPECTED CLIMATE IMPACTS

PCC partners have invested in actionable science and in-depth work to better understand the climate impacts expected in their jurisdictions. Read more about what climate-related changes are expected in California, Oregon, Washington, and British Columbia:

- **California:** [California's Fourth Climate Change Assessment – Statewide Summary Report](#)
- **Oregon:** [Fourth Oregon Climate Assessment Report – State of climate science 2019](#)
- **Washington:** [Preparing for a Changing Climate: Washington State's Integrated Climate Response Strategy](#)
- **British Columbia:** [Indicators of Climate Change for British Columbia \(2016 Update\); Preliminary Strategic Climate Risk Assessment for British Columbia \(2019\)](#)

THE IMPORTANCE OF ENHANCED CLIMATE RESILIENCE IN THE REGION

Climate resilience is vitally important to our region. It can help make communities of all sizes and types with their own unique needs throughout the Pacific Coast region ready for the changes to come. Planning and preparing will allow communities to become more resilient and able to respond to potential issues and impacts in a proactive manner.

Health and Safety

A range of adaptive measures can be employed to keep residents safe and healthy. These include reducing heat island effects, requiring passive cooling in new buildings, reducing the probability of wildfire, employing air filters in public spaces to reduce wildfire smoke exposure, creating flood resilient infrastructure, monitoring for ocean warming events that can increase toxicity in regularly consumed species, and more. Preparing communities and educating individuals on the risks to health and safety from climate change can reduce response costs to extreme events and add capacity to respond to events regionally. Preparation and education can reduce recovery costs related to infrastructure, important service delivery, and mental health impacts within communities. Reducing climate risks results in healthier individuals and more resilient communities.

Equity

The impacts of climate change will be felt by all individuals and communities across the Pacific Coast region. However, not all people will experience these impacts equally because of underlying and systemic inequities that exist within our communities. Climate adaptation and resilience requires strategically addressing the factors that contribute to vulnerability and existing inequities, including institutionalized racism and exclusion; poor environmental conditions, lack of investment, and poor living conditions; existing conditions such as chronic health or mental illnesses; and a lack of opportunities. All of these factors contribute to a person or community's vulnerability to the impacts of climate change and ability to adapt. Communities that are dependent upon healthy and bountiful natural and marine resources for their livelihoods and local economy are at higher risk of experiencing direct impacts.

Adaptation investment and actions will only contribute to broader resilience outcomes if they include and advance social, racial, and economic equity. Communities on the front lines of climate change caution that the goal of climate adaptation should not be simply to help people “bounce back” after disasters and other climate effects, but to “thrive through” and “bounce forward” to a renewable, sustainable economy marked by inclusive democratic participation in the policy decisions that affect daily life.

Economic Stability

Extreme events will disrupt supply chains and damage businesses and products. They will limit access to natural resources and create challenges for urban and rural tourism. Changes to the climate that are occurring more slowly, such as ecosystem shifts or changes to the water cycle, will present challenges for agriculture and other sectors based on natural and marine resources. Integrating physical climate risk in financial and asset investment decisions will result in a more resilient, stable, and sustainable economy. There are already indications that investors are looking to more reliable markets to invest capital, where the likelihood of disruptions as a result of climate change have been reduced.

Ecosystem Health

Climate resilience can also have benefits to ecosystem health. Building ecosystem corridors and connectivity in the landscape and coastline can allow species to move as their range shifts with the changing climate. Taking

actions to prepare the ecosystems of the Pacific coast for the changes that might occur can help ensure that species diversity is maintained, changing migration patterns are understood, and healthy ecosystems are preserved over time.

Built Environment

Buildings and infrastructure will continue to be exposed to greater climate stresses and shocks. Climate resilience in the region's built environment means that our infrastructure will be able to withstand those climate stresses and shocks while continuing to provide the critical services on which communities in the region rely. Building with durable materials and developing performance-based standards can extend the life of structures or reduce operational costs throughout their life. Adding nature-based solutions can help improve stormwater management and create more resilient coastlines while also adding visual appeal to an area.

Building climate resilience does not just help prepare for climate change but for many different types of disasters that could occur. When jurisdictions are better prepared, adaptable, and strong in the face of internal and external pressures and stresses, essential functions are maintained and modified to effectively adapt to future conditions.

BENEFITS OF WORKING TOGETHER

Given the importance of climate resilience to our region and the shared priorities of PCC partners, collaboration on climate resilience is essential. However, not all climate resilience issues lend themselves to regional collaboration or approaches. Our current priorities for regional collaboration focus on climate resilience activities that:

- Apply to shared natural and built systems that cross state, provincial, and city borders in our region.
- Address shared regional risks and develop regionally applicable solutions.
- Provide regional benefit, allowing us to go farther, faster together than each jurisdiction could do on its own.
- Facilitate exchange of information and expertise that is broadly applicable in the region and strengthen joint management, outreach, and communications where applicable.
- Leverage the scale of regional markets and send a stronger market signal through joint priorities and aligned policies.
- Demonstrate regional leadership and inspire other regional efforts and scaling to the national and international level.

Tribal and Indigenous Governments

To truly advance regional solutions to climate change, it is important that the PCC jurisdictions partner with Tribal and Indigenous governments in ways that align with and respect inherent and treaty rights, self-determination, cultural practices and values, and traditional knowledge.

California, Oregon, and Washington, as state PCC partners, recognize that climate change, and the ways that states respond to it, can have impacts on Tribal Governments. This includes impacting subsistence rights and access to traditionally significant plant, animal, and aquatic species. As efforts move forward to build resilience in the face of climate change, the US state PCC partners recognize the unique position of Tribal Governments in their own right, each with its own protocols for engaging outside partners and sharing traditional knowledge.

The Province of British Columbia recognizes that Indigenous peoples are essential partners in adapting to climate change. Actions to prepare for and respond to climate change will take place on the territories of Indigenous peoples, who have stewarded the land and waters for millennia and have rich knowledge systems that have been passed down through generations. Working in partnership with Indigenous governments is foundational to creating a climate resilient future for all of B.C. This work is guided by Canada's *Constitution Act*, which recognizes and affirms existing Aboriginal and treaty rights and title, and the B.C. *Declaration on the Rights of Indigenous Peoples Act*, that affirms the Province's commitment to implementing the *United Nations Declaration on the Rights of Indigenous Peoples*.

Local Governments

The PCC recognizes the critical role local governments play to achieve a climate resilient future for our region. Cities, counties, and other forms of local government are in the critical path to address climate change. They provide direct services to individuals, communities, and businesses; oversee and manage land-use decisions, codes and regulations; develop comprehensive short- and long-range plans; own and manage large property, infrastructure, utility, and transportation systems; and directly respond to floods, fires, heatwaves, droughts and other climate related events. They are also the first to feel the financial impact of climate change that makes it more difficult to address the needs of at-risk and vulnerable communities. State and provincial governments issue regulations, direct funds, and provide a variety of resources and guidance for local jurisdictions to apply to their specific region based on population, geography, local ecology, or other factors.

Across the region, local governments have a wide swath of climate preparedness and resilience plans with a broad focus on areas such as climate resilient infrastructure and buildings, healthy and vigorous natural areas and green space, connected and prepared communities, disaster preparedness and recovery, coastal preparedness, and racial equity and justice plans and programs. Strong collaboration between all levels of government is crucial for the region to move toward a more resilient future.

Principles to Guide Collaboration

The following principles will guide regional collaboration in any climate resilience work:

- **Equity in everything we do.** Consistent with the PCC Climate Resilience Declaration, we recognize that additional action is needed to ensure the most vulnerable and disadvantaged populations in our communities are equipped to thrive in a climate-impacted world, with special attention to those living in rural, impoverished and particularly vulnerable or isolated areas. We must ensure that our policies and

COVID RECOVERY AND RESILIENCE

Most PCC city partners have endorsed the [C40 Mayors Agenda for a Green and Just Recovery](#), a joint initiative to advance an equitable and sustainable recovery from the COVID pandemic. The principles of the C40 agenda recognize that we cannot return to business as usual and the need to simultaneously accelerate economic recovery, enhance social equity, and improve the resilience of communities most affected by climate and health. For the cities of the PCC, this means recognizing and addressing the disproportional impact of COVID and climate change on black and brown communities.

PCC states within the US signed the [2020 Climate Alliance letter](#) which highlights recommendations from the Alliance to Congress on addressing the COVID emergency and relief efforts. Those recommendations are to provide at least \$500 billion in federal aid for states and territories, provide flexible funding to modernize, decarbonize, and enhance the resilience of our nation's infrastructure; and to establish incentives to mobilize private investment and create public-private partnerships.

responses don't exacerbate or create new vulnerabilities for these populations. All of our work on climate resilience should have equity at its core.

- **Be proactive.** As much as possible, the Pacific Coast should be anticipating and preparing for natural disasters exacerbated by climate change and long-term ecological changes, which avoids the need for costly response.
- **In the near-term, build a strong foundation for climate resilience.** Early efforts should be devoted to building the necessary tools, analysis, plans, and strategies that guide future climate resilience work.
- **Seek opportunities to leverage resources.** Regional attention should focus on approaches with significant opportunity to leverage large-scale public and private investment in climate resilience to meet the magnitude of the need.
- **Inclusively engage the right partners and all the communities we serve.** Climate resilience work spans many systems and disciplines that are the focus of a range of public agencies at local, state, provincial, tribal, and national scales. These issues are also of great importance to a range of stakeholders, and their efforts are critical for success. Our work in different areas will seek to engage the right organizations and interests for each topic.

A TRACK RECORD OF REGIONAL COLLABORATION ON CLIMATE RESILIENCE

Memorandum of Understanding (MOU) on Pacific Coast Temperate Forests

The *Memorandum of Understanding (MOU) on Pacific Coast Temperate Forests* supports knowledge sharing among our region's state and provincial forestry agencies. Signed by government forestry leaders from British Columbia, Washington, Oregon, and California, the MOU cites the effects of climate change on forestry values and functions including biodiversity, water supplies, recreation, carbon sequestration, and the forest products industries that provide jobs and support rural and natural resource-dependent communities. Recognizing that each jurisdiction can benefit from working together, the leaders pledged to share and explore information regarding forest management under changing climate conditions, including:

1. Fuel management methods
2. Climate-informed reforestation
3. Accounting for changes in forest carbon
4. Science and data collection regarding how forests are responding to changes in climatic conditions
5. Utilization of harvested wood products
6. Reducing conversion of forestland and promoting carbon-rich, climate resilient forests
7. Investments in natural and working lands that increase carbon sequestration, enhance forest resilience, encourage multi-benefit forest uses, and support natural resource dependent communities.

Ocean Acidification and Hypoxia

The PCC has led regionally and globally by promoting and implementing actions that increase scientific understanding, raise awareness, and develop solutions that address ocean-climate impacts. Following the mid-2000's observations of massive impacts of ocean acidification (OA) to oyster hatchery production, OA and other changing ocean conditions like warming and loss of oxygen (hypoxia) have become critical climate change issues within the PCC agenda. Coordinated science and monitoring aids our governments in understanding the regional trends and impacts of ocean change on our communities and ecosystems. Regional science informs actions that reduce impacts, improve resilience, and support adaptive management. Regional leadership has helped to leverage expertise and resources, raise greater awareness, build broader partnerships, and coordinate our actions.

PCC efforts include:

- Engagement with the West Coast Ocean Acidification and Hypoxia Science Panel which synthesized scientific understanding and recommended a series of local and regional strategies for addressing the challenge, such as coordinated investments in regional monitoring to create a basis for evaluating actions.
- Commissioning the West Coast Ocean Acidification and Hypoxia Assets Inventory. Completed in 2018 in partnership with academia and state, provincial, and federal governments, the inventory sets the stage for informing additional priorities and strategic monitoring investments.
- Founding the International Alliance to Combat Ocean Acidification in response to the subnational call for climate and ocean leadership unleashed by the Paris Agreement at COP21, to advance the influence of existing state and regional collaboration on an international scale. National governments such as Fiji, Chile, New Zealand, France, and Sweden joined the PCC-led effort which now includes over 100 members committed to addressing OA and elevating ocean impacts across climate policy frameworks.

Going forward, the PCC OAH Working Group will continue to focus on prioritizing the West Coast region's research and monitoring needs and bring key investments to the West Coast that improve our preparedness for the coming changes. By rigorously documenting trends in key climate and ocean acidification metrics and sharing our experiences with solutions, the PCC is empowering resource managers and decisions-makers to implement adaptation and mitigation strategies needed to improve the resilience of our coastal communities, economies and the health of our oceans.