

# Climate Change

## What it means for BC • Winter 2011

Research from Simon Fraser University's Adaptation to Climate Change Team (ACT) predicts that climate change will have very serious consequences for BC communities and our natural environment.<sup>1</sup>

### Wildlife, Fisheries and Natural Ecosystems

Canada's greenhouse gas (GHG) emissions have increased by more than 26% since 1990, helping push global atmospheric concentrations of CO<sub>2</sub> to more than 390 ppm. Without global action to reduce emissions, concentrations will rise to 550 ppm by 2050, causing an average global temperature increase of at least 2°C. By the end of the 21st century, a "business as usual" growth in emissions could see global temperature rise by 5°C.<sup>2</sup>

But according to ACT research, even a 1°C increase in annual temperature is likely to displace ecosystems as far as 150km northwards and 300m in elevation, displacing BC wildlife and drastically altering local environments.<sup>3</sup> The consequences of 2°C or more rise would be much worse.

While the ultimate severity of problems will vary depending on the degree of global climate change, research is clear about the general pattern of impacts on BC ecosystems. Coastal forests, for example, will suffer from increased storms, while higher temperatures, dryer weather and the proliferation of pest species such as the mountain pine beetle will lead to worsening wildfires in many other regions.<sup>1,3</sup>

Higher water temperatures and reduced flows will disrupt BC's fresh-water ecosystems, including salmon and trout habitat. Increased ocean temperatures and acidification from raised CO<sub>2</sub> levels will damage marine ecosystems and threaten many fisheries.<sup>2,3</sup>

### Extreme Weather Events

Climate models project a rise in the frequency and severity of extreme weather-related events, such as



Wildfires, like the ones that hit BC in 2003 and 2009, will become more frequent and more severe because of heat waves, droughts and thunderstorms.

the destructive storms that hit coastal BC in 2006 and the heat waves, droughts and thunderstorms that contributed to severe wildfires across BC in recent years. These events will have major impacts on BC communities, infrastructure, parks and the provincial economy. Remote communities and low-lying coastal areas will be particularly hard hit.<sup>3</sup>

### Energy Supply Disruptions

BC's energy production, distribution, and demand are all likely to be adversely affected by climate change. Reduced snow pack and glaciers, combined with droughts, will affect the quantity of water available for hydroelectric generation. More severe storms, wildfires and similar extreme events will pose ongoing threats to power delivery in many areas.<sup>3</sup>

### Impact on Water Supply

Declining snowpack, retreating glaciers and shifting rainfall patterns will limit or seasonally alter water supplies in many areas of BC. Likely impacts in-

clude reduced water supplies in summer and fall; supply-demand mismatches in reservoirs; increased demands on municipal water and sewage treatment facilities; and overloading of storm water management systems. In addition, rising sea-levels may cause saltwater intrusion into groundwater sources.<sup>1,3</sup>

## Impact on Agriculture

On the positive side, warmer weather and longer growing seasons may allow for new crops and increased yields in some parts of BC. But at the same time, worsening droughts, and increased water demand will stress many forms of agriculture. Increased irrigation demand is predicted for drier areas, and higher temperatures may result in new pests and diseases, as well as forest fires that threaten crops. Saltwater intrusion into aquifers may affect irrigation water supplies.<sup>3</sup>

## Health Risks

According to a recent report from one of the world's leading medical journals, "climate change is the biggest global health threat of the 21st century."<sup>4</sup> In BC, direct threats to human health include a rise in injuries, illnesses and deaths related to air quality, natural hazards, extreme weather and heat. Indirect threats include exposure to a wider variety of diseases, general declines in ecosystem health and increased stress-related health problems. Respiratory problems such as asthma and emphysema will be aggravated by forest fires and increased ground-level ozone. Higher workloads for healthcare workers and more frequent emergencies could even impact our healthcare system itself.<sup>3</sup>

## Rising Sea Levels

A one-metre rise in sea level would flood more than 4600 hectares of farmland and more than 15,000 hectares of industrial and residential urban areas in BC. Rising sea levels potentially threaten billions of

dollars in infrastructure, including highways, sewer systems, waste treatment facilities, shipping and ferry terminals, Vancouver's International Airport, and even residential housing in low-lying areas such

as Richmond and other coastal communities. Coastal communities will be increasingly vulnerable to erosion, storm surges, and extreme high-water events.<sup>1,3</sup>

## Population Displacement

In BC's Lower Mainland, approximately 220,000 people live near or below sea level in Richmond

and Delta and are likely to be affected by rising sea levels.<sup>3</sup> Though it may be decades away, there is a real prospect of eventual evacuation. Dozens of other coastal communities will be similarly affected. Resettlement of BC populations displaced by climate change could put development pressure on the prime farmland that surrounds many of our cities, and impose additional pressures on our natural environment.



Severe storms and other extreme weather events will pose ongoing threats to power delivery in many areas of BC.

### Sources

1. Doug Henstra and Gordon McBean (2009). *Climate Change and Extreme Weather: Designing Adaptation Policy*. SFU Adaptation to Climate Change Team (ACT)
2. Nicholas Stern (2006). *The Stern Review on the Economics of Climate Change*: [http://www.hm-treasury.gov.uk/sternreview\\_index.htm](http://www.hm-treasury.gov.uk/sternreview_index.htm)
3. Deborah Harford (2008). *Climate Change Adaptation: Planning for BC*. The Pacific Institute for Climate Solutions & the SFU Adaptation to Climate Change Team (ACT)
4. Anthony Costello et al. (2009). "Managing the health effects of climate change". *The Lancet* Volume 373, Issue 9676, Pages 1693 - 1733

### Further Reading

Adaptation to Climate Change Team (ACT) at Simon Fraser University website: <http://www.sfu.ca/act/>  
Suzuki Foundation website on climate change impacts on BC: [http://www.davidsuzuki.org/climate\\_change/impacts/british\\_columbia/](http://www.davidsuzuki.org/climate_change/impacts/british_columbia/)  
BC Sustainable Energy Association website: [www.bcsea.org/](http://www.bcsea.org/)  
Smart Growth BC website: [www.smartgrowth.bc.ca/](http://www.smartgrowth.bc.ca/)