



***To the Editor:***

*This is an article from a series of monthly columns by Environmental Law Specialist Dianne Saxe, one of the top 25 environmental lawyers in the world, and Ms. Jackie Campbell. These articles are available for publishing at no charge, provided Dr. Saxe and Ms. Campbell are cited as the authors. Dr. Saxe can be contacted at (416) 962 5882 or [admin@envirolaw.com](mailto:admin@envirolaw.com). For more information, visit <http://envirolaw.com>.*

## Weather or Climate change?

It's hard to know whether individual weather events are just random fluctuations, or whether they are growing signs of climate change. What we need to look for are *patterns*—is the weather changing? And how do the changes that are actually happening compare to those predicted for climate change?

Three years ago, two federal government departments (Natural Resources Canada and Health Canada) published reports on the damage climate change was already doing to Canada, and what we should expect to follow. No one paid much attention, but the predictions just keep coming true, in Canada and around the world.

Time to read only one? Health Canada predicted that global warming would increase Canadians' exposure to diseases that are endemic in animals, including: bubonic plague. Plague? In Canada?!? The black death that killed one third of the population of medieval Europe? Last week, Parks Canada announced that a prairie dog in a national park had been found, dead of... bubonic plague.<sup>i</sup>

NRCan's report, *From Impacts to Adaptation: Canada in a Changing Climate 2007*,<sup>ii</sup> predicted summer heatwaves that are more extreme and longer, leading to deaths, reduced crop growth and wildfires. This year looks as if it will be the hottest year in recorded history.<sup>iii</sup> Wildfires burned again in BC. The Yukon had 32,000 hectares of forest burned by early June.<sup>iv</sup> Quebec's May forest fires required people to evacuate their homes, and burned over 350 square miles (880 square kilometres) in a week.<sup>v</sup>

A recent study says that heat waves have already surpassed worst-case projections, but will become more intense and unpredictable.<sup>vi</sup> Toronto's sweltering summer pales against what is happening in other northern countries. As we write, everyone who can is fleeing Moscow because of fire and smoke<sup>vii</sup>; Russia has had an estimated 15,000 deaths from heat.<sup>viii</sup> The heat is also predicted to reduce Russian agricultural and industrial output by \$1.5 trillion.

Here are more of NRCan's 2007 predictions, compared to recent news reports (in italics):

**Northern Canada** will see decreases in permafrost, sea and lake ice and snow cover. *Recent research confirms: the Devon Island ice cap, one of the largest and most important arctic ice masses, has been shrinking steadily since 1985.<sup>ix</sup> Arctic ice cover*

may be at its lowest level in several thousand years.<sup>x</sup> There will be a shift in the types and number of species of plants and animals, with competition by species that move north, and introduction of new diseases. An epidemic of spruce bark beetle will likely lead to decimation of white spruce trees.

There will be more frequent and intense storms in **Atlantic Canada**. Sea levels will rise, increasing erosion of the coastline and flooding. *Storms in Nova Scotia and New Brunswick brought power failure and flooding in February.*<sup>xi</sup> *Last year brought record wet weather.*<sup>xii</sup>

In **Québec** and **Ontario**, extreme weather, like heat waves, drought, intense rain, ice- and wind-storms, will be more frequent, stressing water, energy and transportation infrastructures. *Much of southern Ontario and Quebec is facing dry to record dry conditions this year.*<sup>xiii</sup> *Near-record-low precipitation has deprived hydroelectricity operators of the water levels needed to turn they turbines.*<sup>xiv</sup> *Ontario had an astonishing 29 tornados in 2009.*<sup>xv</sup>

The **Prairies** will see a shift in fire and insect disturbances, and an increase in non-native species. Water will become more scarce; wildfires and severe floods will occur more often. *Northern Prairies are exceptionally dry this year, while the south wallows in very wet conditions.*<sup>xvi</sup> *In July, heavy rain triggered the most severe flooding ever seen in Yorkton, Saskatchewan.*<sup>xvii</sup> *Calgary had \$400 million in hail damage in July, one of Canada's most expensive storms ever.*<sup>xviii</sup> *Last year, the Red River had record floods.*

Some regions of **British Columbia** will have more water shortages, and more competition among uses for the water (e.g., for power, irrigation, municipalities, recreation). *A melting glacier triggered an avalanche of mud near Pemberton this month, resulting in evacuation of 1500 residents.*<sup>xix xx</sup> Fires and pest infestations will affect forests. *Last year, there was a 7-fold increase in BC forest fires.*<sup>xxi</sup> *The largest known outbreak of mountain pine beetle has killed millions of trees, and is spreading rapidly.*

Coincidence or pattern? I'm worried; are you?

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<sup>i</sup> <http://www.health.gov.sk.ca/prairie-dog>

<sup>ii</sup> [http://www.adaptation.rncan.gc.ca/assess/2007/pdf/full-complet\\_e.pdf](http://www.adaptation.rncan.gc.ca/assess/2007/pdf/full-complet_e.pdf)

<sup>iii</sup> <http://www.theglobeandmail.com/news/national/its-the-hottest-year-in-recorded-history/article1643338/>

<sup>iv</sup> CBC news. Yukon mine braces for wildfire.

<http://www.cbc.ca/canada/north/story/2010/06/02/yukon-nwt-ffire-conditions.html>

<sup>v</sup> Bloomberg. Quebec Forest Fires Send Smoke, Haze South to Boston (Update2). May 31 2010. <http://www.businessweek.com/news/2010-05-31/quebec-forest-fires-send-smoke-haze-south-to-boston-update2-.html>

<sup>vi</sup> Ganguly et al., Higher Trends But Larger Uncertainty And Geographic Variability In 21st Century Temperature And Heat Waves, Proceedings of the National Academy of Sciences, 2009. Fulltext at <http://www.pnas.org/content/106/37/15555.full.pdf+html>

<sup>vii</sup> <http://www.theglobeandmail.com/news/world/europe/smoke-from-forest-fires-choke-russian-capital/article1664389/>

<sup>viii</sup> Bloomberg. Russia heat wave may kill 15,000, shave \$15 billion of GDP. August 10 2010. <http://www.bloomberg.com/news/print/2010-08-10/russia-may-lose-15-000-lives-15-billion-of-economic-output-in-heat-wave.html>

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<sup>ix</sup> Boon S et al. Forty-seven years of research on the Devon Island ice cap, Arctic Canada. *Arctic* 2010 March;63(1):13-29. See news report “Decades of research show massive Arctic ice cap is shrinking”. *EurekAlert* Apr 12 2010. At

[http://www.eurekalert.org/pub\\_releases/2010-04/aion-dor041210.php](http://www.eurekalert.org/pub_releases/2010-04/aion-dor041210.php)

<sup>x</sup> <http://www.treehugger.com/files/2010/06/arctic-ice-cover-at-lowest-point-past-several-thousand-years.php>

<sup>xi</sup> CBC news. Power outages, flooding still concern N.B., N.S. February 28 2010.

<http://www.cbc.ca/canada/nova-scotia/story/2010/02/28/nb-ns-power-outage-flood-red-cross-254.html>

<sup>xii</sup> Environment Canada. Canada's Top Ten Weather Stories For 2009

<http://www.ec.gc.ca/meteo-weather/default.asp?lang=en&n=645a8f9c-1>

<sup>xiii</sup> Drought Watch, [http://www.agr.gc.ca/pfra/drought/nlr1365dy\\_e.htm](http://www.agr.gc.ca/pfra/drought/nlr1365dy_e.htm)

<sup>xiv</sup> *Globe and Mail*, August 12, 2010.

<http://v1.theglobeandmail.com/servlet/story/LAC.20100813.RBPOWERHYDROMCCA.RTHYATL/TPStory/?query=Companies>

<sup>xv</sup> Environment Canada. Canada's Top Ten Weather Stories For 2009

<http://www.ec.gc.ca/meteo-weather/default.asp?lang=en&n=645a8f9c-1>

<sup>xvi</sup> [http://www.agr.gc.ca/pfra/drought/nlr1365dy\\_e.htm](http://www.agr.gc.ca/pfra/drought/nlr1365dy_e.htm)

<sup>xvii</sup> CBC news. Flood emergency declared in Yorkton, Sask. July 2 2010.

<http://www.cbc.ca/canada/saskatchewan/story/2010/07/02/sk-yorkton-flood-1007.html>

<sup>xviii</sup> [http://www.ibr.ca/en/Media\\_Centre/News\\_Releases/2010/08-11-2010.asp](http://www.ibr.ca/en/Media_Centre/News_Releases/2010/08-11-2010.asp)

<sup>xix</sup> *Times Colonist*. 13 campers airlifted after melting glacier triggers avalanche

<http://www.timescolonist.com/news/airlifted+after+landslides+tourist+spot/3368909/story.html>

<sup>xx</sup> *Vancouver Sun*. 40-million-cubic-metre Pemberton avalanche second only to Hope Slide. August 9 2010

<http://www.vancouversun.com/news/million+cubic+metre+Pemberton+avalanche+second+only+Hope+Slide/3372960/story.html>

<sup>xxi</sup> Environment Canada. Canada's Top Ten Weather Stories For 2009

<http://www.ec.gc.ca/meteo-weather/default.asp?lang=en&n=645a8f9c-1>