

## Weather, Climate, and Data Centres

Climate events can affect data centers even more drastically than power system events. Heat waves can present a particularly challenging problem. In this paper, eSecureData will discuss the climate factors that should be taken into consideration when choosing a data center to host your infrastructure.

### Heat Waves

Internet servers are sensitive to heat. They operate less efficiently at high temperatures, and more importantly, they shut off at high enough temperatures. Hard drive manufacturers recommend avoiding prolonged high temperature operation. Data centers must design cooling systems that keep average ambient temperatures under control while also eliminating high temperature events<sup>[1]</sup>.

eSecureData has built facilities that take advantage of naturally cool environments. The lower mainland of Vancouver is one of the most temperate climates in the world, and does not experience heat waves by world standards<sup>[2]</sup>.

If you look for the major cities in the world that don't experience significant heat waves, you end up with a fairly short list. Amsterdam, London, and Vancouver are your best choices. Beijing, Berlin, Moscow, New York, Paris, and Seattle all have higher record highs (see Table 1).

|           | Yearly Avg. High | Yearly Avg. Low | Yearly Avg. | Record High | Record Low |
|-----------|------------------|-----------------|-------------|-------------|------------|
| Amsterdam | 12°C             | 6°C             | 10°C        | 33°C        | -32°C      |
| Beijing   | 17°C             | 7°C             | 12°C        | 41°C        | -17°C      |
| Berlin    | 13°C             | 5°C             | 9°C         | 35°C        | -23°C      |
| London    | 15°C             | 7°C             | 11°C        | 34°C        | -10°C      |
| Moscow    | 8°C              | 0°C             | 4°C         | 35°C        | -42°C      |
| New York  | 17°C             | 9°C             | 13°C        | 41°C        | -26°C      |

|           |      |     |      |      |       |
|-----------|------|-----|------|------|-------|
| Paris     | 16°C | 8°C | 12°C | 40°C | -23°C |
| Seattle   | 16°C | 7°C | 11°C | 38°C | -16°C |
| Vancouver | 13°C | 4°C | 8°C  | 34°C | -21°C |

Table 1: Average and Record Temperatures for Major Cities in Temperate Climates.  
Sources: <http://www.weatherbase.com/>, accessed May 15th 2014; <http://www.bbc.com/weather/>, accessed May 15th 2014

## Snow and Ice Storms

eSecureData's facilities are located in areas that have experienced both snow and ice storms, but these occur far less frequently and with less severity than in any other part of Canada<sup>[3]</sup>. In our regions, at historical levels, these storms tend to primarily affect traffic, with no other widespread consequences<sup>[4]</sup>. To date, no eSecureData facility has had its operations interrupted by a snow or ice storm. When people think of Canada, winter is often one of the first things they think of. eSecureData facilities, however, are located in among the mildest climates in Canada, and these areas experience minimal snow, ice or sub-freezing temperatures<sup>[5]</sup>.

## Tornadoes

Tornadoes make spectacular and frightening news. eSecureData's data centers are located in areas that have never experienced significant tornadoes<sup>[6]</sup>.

## Hurricanes

A major Hurricane or Typhoon can cause both direct and indirect damage. Buildings can be damaged, but resulting damages from flooding and power outages can be just as consequential<sup>[7]</sup> to data center operation and recovery.

eSecureData's facilities are located in areas without significant hurricane risk. Hurricanes and typhoons are tropical events that occasionally migrate outside the tropics. There have been no significant hurricane events recorded in the locations of any eSecureData facilities<sup>[8]</sup>. Even broadening the area to include nearby cities, there hasn't been a major tropical storm event in any eSecureData region since one made

landfall on Vancouver Island, 100 km (or about 60 miles) away, in 1962, over 50 years ago<sup>[9]</sup>.

## Flooding

The primary causes of major geographic flooding are snow melt and rainfall. eSecureData's facilities are located in areas that have not experienced significant flooding since before 1900<sup>[10]</sup>.

## Summary

The risks presented in hosting your server infrastructure in a location susceptible to weather events or extreme heat are significant and easy to overlook. eSecureData has not overlooked them. If you are interested in a hosting environment that presents minimal climatic risk, take a look at the eSecureData website at [www.esecuredata.ca](http://www.esecuredata.ca).

## You May Also Be Interested In

"Why Should I host my website in Canada?" by webnames.com, Accessed April 18, 2017.

"Why cold Canada is becoming a hot spot for data centres," by Jonathen Stoller, The Globe and Mail, January 8 2013, <http://www.theglobeandmail.com/report-on-business/economy/canada-competes/why-cold-canada-is-becoming-a-hot-spot-for-data-centres/article6598555/>

"The Impact of Weather," by Gary Kerney, Verisk Analytics, <http://www.verisk.com/Verisk-Review/Articles/The-Impact-of-Weather.html>

"Here's how bad winter weather is hurting the economy," by Kristen Scholer, February 5 2014, CNBC, <http://www.cnbc.com/id/101393284#>

## Footnotes

- [1] "Heat of the Moment," Processor 28, no. 26 (2004), <http://www.processor.com/article/5445/heat-of-the-moment>
- [2] "Weather Conditions in capital and major cities (Temperatures)," last modified October 12th 2007, <http://www.statcan.gc.ca/tables-tableaux/sum-som/l01/cst01/phys08b-eng.htm>
- [3] The Canadian Disaster Database, accessed April 30 2017, <http://cdd.publicsafety.gc.ca/srchpg-eng.aspx?dynamic=false>
- [4] "World, 21st Century -> Power Outages Map," <http://www.mapreport.com/century/subtopics/d/o.html>
- [5] "Canadian Climate Normals," <http://www.climate.weather.gc.ca/>, last modified February 13 2017, [http://www.climate.weather.gc.ca/climate\\_normals/index\\_e.html](http://www.climate.weather.gc.ca/climate_normals/index_e.html)
- [6] Kathryn Provic, "From domestic to international: Tornadoes around the world," <http://www.ustornadoes.com/>, July 25 2013, <http://www.ustornadoes.com/2013/07/25/from-domestic-to-international-tornadoes-around-the-world/>
- [7] "Damages Caused by Hurricanes," The Columbia Electronic Encyclopedia 6, (Columbia University Press), 2012, <http://www.infoplease.com/encyclopedia/weather/hurricane-damage-caused-hurricanes.html>
- [8] "Hurricanes," Weather Almanac, no. 1, <http://www.weatherexplained.com/Vol-1/Hurricanes.html#b>
- [9] Rob Klovance, "Daddy, will monster hurricanes come to B.C.?", [BCHydro.com](http://www.bchydro.com/news/unplug_this_blog/2012/hurricanes-in-bc.html), October 30 2012, [http://www.bchydro.com/news/unplug\\_this\\_blog/2012/hurricanes-in-bc.html](http://www.bchydro.com/news/unplug_this_blog/2012/hurricanes-in-bc.html)
- [10] Jim E. O'Connor and John E. Costa, "The World's Largest Floods, Past and Present: Their Causes and Magnitudes," U.S. Geological Survey Circular 1254, Accessed on April 8, 2018. <http://pubs.usgs.gov/circ/2004/circ1254/pdf/circ1254.pdf>