RESEARCH2REALITY
Shining a light on research & innovation.

Extreme Weather, Meet Big Data

An interview with Professor Dick Peltier
Global Climate Change Scientist, University of Toronto

How can we predict and analyze climate change?

Usually the climate change problem is described solely in terms of the increase in temperature since the beginning of Northern Hemisphere industrialization. I mean, at present, we are up about 8/10 of a degree Centigrade. It doesn't sound like very much but of course that increase in temperature isn't how shall I say equably distributed over the surface of the earth. It's rising much much more rapidly in the High Arctic, and of course Canada has a big chunk of the High Arctic where the temperature increase is more than double the global average. So we are looking at a future in which there's basically no sea ice in the Arctic Ocean during summer, where the sea ice that's existing in the Arctic Ocean in winter is extremely thin. The most severe impacts, if you'd like, of the global warming process are going to be found in extreme events: periods of intense precipitation, for example. All of the models on which I and my colleagues work predict that the frequency of events of this extremity will increase dramatically.

How does big data apply to your research?

The big data problem of course is right at the heart of the problem of making global warming projections. The data sets that we require to make these projections into the future are on the hundreds of terabytes level. This is a quintessentially big data problem. We require huge storage capacity, extremely fast computers in order to enable us to make the projections of how these data evolve in time. In fact, the whole problem, if you like, of climate change projection is you know, usually talked about as one of the grand challenge problems, if you like, in all of science.