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## Research That Matters column - September 2019

Adam Fenech – University of Prince Edward Island

### 'Climate change: The solutions are out there'

Adam Fenech, the leading Canadian scientist who runs the University of Prince Edward Island's Climate Lab, describes himself as a frightened optimist.

Fenech's optimism is based in the idealism of his students and the capacity of humanity to adapt. His fear is fuelled by the accelerated pace of climate change.

The 55-year-old climatologist says he and his colleagues expected a rapid succession of Category 5 storms 60 years from now. Instead, a series of destructive hurricanes - including Hurricane Dorian, which just pounded the Bahamas - is already upon us.

Climate scientists also anticipated that massive portions of Antarctica would break off into the sea – in a century or so. Instead, the world's coldest continent already sheds mammoth icebergs. In 2016, a fracture of the Larsen C ice shelf created an iceberg that NASA said was "roughly the size of the state of Delaware".

Fenech is an old pro in the climate wars. He's edited eight books on climate change, and he shares the 2007 Nobel Peace Prize as one of the hundreds of scientists who are members of the United Nation's Intergovernmental Panel of Climate Change (IPCC).

While many of his fellow climatologists retreat from the debate on climate change, Fenech takes the battle public. "My colleagues will say they need another 10 years of data before reaching conclusions. And then another 10 years after that. I just don't think that works anymore."

The impact of climate change is all too evident in the Garden of the Gulf. PEI's famous red soils, a product of the sandstone that dominates so much of the island's geology, are highly vulnerable to erosion at the best of times. In the current environment, with more frequent and dramatic storms, the shoreline shifts or collapses into the sea at a steady rate.

Fenech and his students measure erosion by planting 100 sets of pins each year at shoreline sites around the island. The results are dramatic – PEI's coastline is retreating on average by about 30 centimetres per year, and by up to five metres in a single year in some places. What are the impacts? The UPEI Climate Lab estimates 1,000 homes and 17 of those iconic island lighthouses are vulnerable to sea and storm.

Nor, in Atlantic Canada, are the risks of climate change limited to PEI. The Isthmus of Chignecto, the low-lying land bridge connecting New Brunswick and Nova Scotia, is "susceptible to being washed out." Given that the value of goods shipped across the

Isthmus has been estimated at \$50 million per day, the prospect of Nova Scotia becoming an island is more troubling than romantic.

Fenech says it may well take a crisis to wake people up to the perils of climate change. In the meantime, he's more inclined to gentle persuasion than hectoring rhetoric in his efforts to educate his students and the public.

His "greatest love" as a scientist is running data, which he does to project future outcomes that makes climate change feel real rather than abstract to his audiences.

For golfers, this means showing that warmer temperatures and changing patterns of precipitation will yield more ideal golf days per year over time.

For farmers, this means planning to grow the species of potato suitable for local soils and climatic conditions. (And helping growers fight back, if necessary, against fast food chains which only want to purchase a single species of potato.)

Fenech is all for providing practical advice that people can use today, starting with his favourite warning – "Don't build your house so darned close to the water."

As to the larger issues, you can protect the Isthmus of Chignecto by "armouring", that is, by reinforcing existing dikes or building new rock walls. The problem with this solution is that it has a best-before date. "The sea wins, eventually."

When asked about longer term solutions, he refers to his young charges. "I teach students who have an incredible desire to change the way the world is run. We have messed things up. They are looking for solutions. It may take a shock and crises to get us to act, but humanity will adapt. I'm a humanist, I believe we are capable of greatness"

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