

THE Innovator

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Climate Change in Canada: The Duval River Disaster

The Duval River roared in Pangnirtung, Baffin Island that fateful Sunday this past June. After a wind-blasted night, its waters abruptly ran roughshod over the barren landscape.

Spring had been unusually warm in this isolated community, right on track to break heat records in the Eastern Canadian Arctic for the fourth year in a row.

Then at about 3 p.m. on June 8, 2008, the river exploded. Without warning, it broke loose and began to rise and kept rising nearly 9 meters higher than normal. An hour later, the Duval was throwing massive chunks of ice around and moving like a tsunami, says Ron Mongeau, Pangnirtung's senior administrative officer.

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“We’re getting into dangerous and unknown territory, far beyond where science or engineering will be able to fix things for us.”

Within 24 hours, the river’s onslaught had wiped out both bridges that served the Arctic hamlet. It bisected the community of 1,300 and shut down access to the sewer system and other vital services. Then day by day, the Duval River valley began to shift and sink, forming vast chasms and sinkholes—sometimes literally overnight.

“No one knew how much further it would go,” says Eryn Sinclair, one of many residents who gathered each day to watch the river veer closer to the hamlet’s houses. What she saw “was scary. It was so unpredictable.”

The ground eventually failed as close to 100 meters from some of the homes. At one point, the river vanished entirely, subsumed beneath the permafrost only to surface suddenly again later.

A week into the emergency, the river began to run perpendicular to its own course. Chunks of the riverbank 30 meters across began collapsing into the river. The permafrost, now exposed, began melting visibly.

By July 2008, the warming phenomenon – including thimble-sized raindrops falling on melting snow – had spread to the nearby Auyuittuq National Park, whose name ironically means “land that never melts” in Inuktitut.



The Duval River Disaster

The park’s Summit Lake burst its boundaries and swept away another bridge. How? A mass of ice-cored moraine (glacial ice from thousands of years ago) suddenly melted, broke off and dammed the lake’s outlet, says Eric Mattson, a snow and ice hydrologist at Nipissing University in North Bay, Ontario who was on hand to assess the damage.

The Summit Lake park staff evacuated 22 visitors who had become stranded in the shifting topography. A large point of land vanished in the deluge. Now maps of the park are not longer strictly accurate, says

park spokeswoman Pauline Scott.

The Pagnirtung and Auyuittuq photos featured here are a dramatic taste of how both the planet’s polar regions are currently altering as the global climate changes, says Mattson.

More startling, though, these shots are a clear example of climate changing making parts of the planet uninhabitable by the creatures that now live in them, says Dr. David Schindler, the Killam Memorial Professor of Ecology at the University of Alberta in Edmonton.

He is one of the world’s experts on water and climate change.

“We’re getting into dangerous and unknown territory, far beyond where science or engineering will be able to fix things for us,” he points out.

Schindler adds that similar lake bursts from rapid melting are happening in some high alpine regions, including the Himalayas. Ice and snow that once reflected the sun’s energy are gone and so that energy is absorbed by the water and land.

Climate scientists have predicted that humans will need to permanently flee some parts of the planet as the climate changes more rapidly, mainly as a result of rising sea levels. So far, this flood of climate refugees hasn't happened but Schindler says he's worried that scientists have been too conservative in their warnings and that the coming changes will have far more severe effects than the public realizes.

New Orleans, which has been evacuated as recently as August 2008 due to Hurricane Gustav and Katrina two years ago, is sometimes dubbed the first community made uninhabitable by climate. Scientists, however, do not agree that the warmer climate directly caused the hurricanes.

In the Arctic, it's a different story. There's no question about the cause. Ice, snow and permafrost are melting because the air is warmer from trapped greenhouse gases. And the changes are happening far faster than anyone predicted, says Mattson.

In Pangnirtung and Auyuittuq, the land is now stable. Although Summit Lake is many meters lower than it was while the Duval River is both wider and deeper.

Now The Big Question is: "What will happen next spring when the melt happens again?" which, in turn, makes one wonder: "Will Pangnirtung become one of the first communities in the world to be abandoned because of climate change?" and, ultimately: "How many others in the Arctic will follow suit?"

"It's hard to say," says Shawn Maley, assistant deputy minister of Nunavut's community and government services, adding: "The permafrost is an integral part of soil solidity."

So far, officials aren't talking about evacuating the community next spring. But they have ordered geological assessments of the permafrost in the area to see what they can find out about the land's stability.

This report is expected before the end of the year. ● ●

▲ *Cover Photo: One of the two bridges leading to Pangnirtung severely damaged by the Duval River (courtesy of Claus Vogel, 2008 tradewindsphoto.ca)*

▲ *Opposite page: (Left) Duval River at full force and (Centre) Residents watch as clean-up begins (courtesy of Claus Vogel, 2008 tradewindsphoto.ca); (Right) Dr. David Schindler, Professor of Ecology, University of Alberta (courtesy of Creative Services, University of Alberta)*

▲ *Below: (Left) Duval River now literally divides both sides of the town (courtesy of Claus Vogel, 2008 tradewindsphoto.ca), (Centre) Summit Lake damage from the air, (Right) the washed out Weasel River bridge near Summit Lake and Pages 2-3 background photo showing Duval River erosion damage (courtesy of Dr. Eric Mattson, Nipissing University, North Bay, Ontario)*

Will Pangnirtung become one of the first communities to become uninhabitable because of climate change?



A Few Minutes with Chuck Hantho



After serving six years as an active, committed director on the IISD board, Chuck Hantho retired in June 2008. In the 1980s, he was Chairman of the Canadian Chemical Producers Association when the industry introduced the “Responsible Care” program for the safe handling and use of chemicals from “cradle to grave”—a program so successful that it has been copied the world over.

Following a career in the chemical and textile fields, Chuck is currently the Chair of the Board of the Hamilton Utilities Corporation. When *The Innovator* caught up with him this fall, here’s what he had to say.

“Over the past decade, the scale and complexity of issues related to sustainable development have accelerated at a dramatic rate. And yet, in terms of how successful society has been addressing these challenges, it often seems to be a case of one step forward and two steps back.

“Meanwhile, IISD has grown in stature and impact. It’s a rich, vital source of information on everything from climate change and natural resources management to alternate energy sources and international trade and investment. It fulfills a genuine global need for advice, research and expertise in sustainable development to address some of the world’s major problems.

“I applaud the extraordinary level of passion and enthusiasm that seems to flow through the entire IISD family in Canada, the US, Europe and beyond. It’s been an honour and privilege to be a part of all that. IISD never loses sight of the human face of sustainability and its role to promote and preserve the health and well-being of this planet we all share.” ••

Inside IISD

Alanna Mitchell, editor of *The IISD Innovator*, author and journalist was awarded this year's \$100,000 Atkinson Fellowship in Public Policy in Toronto in May 2008.

Every year the Atkinson Fellowship recognizes and honours a senior journalist to research a topical issue for 12 months, producing a series of articles for *The Toronto Star*. Alanna's project *The Possible School* will explore policy solutions to ensure that all children have access to the best public education possible—regardless of wealth or status.

The Fellowship is made possible, in part, by the Atkinson Charitable Foundation—which has generously supported IISD projects and programs over the years. Together with its co-sponsors The Toronto Star and the Honderich family, the Fellowship is presented annually by the Canadian Journalism Foundation.



At its 2008 Board of Directors Dinner held in Winnipeg this June, the IISD welcomed a number of new members and paid tribute to the retiring Angela Cropper, Jim Carr and Chuck Hantho—all known for their vision, hard work and passionate commitment. (For more with Chuck Hantho, please see *A View from the Board* on page 4.)

The five new members are Maureen O'Neill, President of the International Development Research Centre in Canada; Bruce Schlein, Vice-President of Environmental Affairs with Citigroup in the USA; Dr. Vicky Sharpe, President and Chief Executive Officer of Sustainable Development Technology Canada; Patricia Moles-Riviero, Coordinator of the Juruti Development Fund in Brazil; and Dr. Emöke Szathmáry, President of the University of Manitoba.

IISD Board Chair Daniel Gagnier and fellow board-members Tensie Whelan and Sir Mark Moody-Stuart were re-elected during the three-day series of annual meetings.

Ian Seymour, IISD's Chief Financial Officer and Secretary-Treasurer, was elected First Vice-President of the governing Council of the Institute of Chartered Accountants of Manitoba (ICAM) in June 2008. In June 2009, he will become the Council's President and Chair. Ian has served on the Council since 2002. He was Secretary-Treasurer from 2005-2007, and Second Vice-President from 2007-2008. With over 2,700 members, ICAM is the largest accounting organization in the province.



IISD Associate Bryan Osborne was honoured as the first recipient of the two-year, \$50,000 Minister of Water Stewardship Scholarship for International Studies during the Manitoba-Israel Water Experts Symposium in Winnipeg on August 14, 2008.

Ultimately, the lessons Bryan learns in Israel will positively impact water issues affecting all Manitobans. A total of \$100,000 was awarded for Manitoba-Israel water management projects. Based on ideas developed at the event, projects will be selected and announced over the coming months. ● ●

Green Finance: Markets of the Future

The Quiet Revolution

Green finance is one of the fastest growing trends in sustainable global investment. From Citigroup's \$50 billion (U.S.) fund for clean technology to the carbon-neutral car insurance offered by Munich-based Allianz, and JP Morgan Chase's mortgage deals on energy-efficient homes—business is booming.

"It's exponential," says Paul Clements-Hunt, head of the Finance Initiative of the United Nations Environment Programme (UNEP FI). "A quiet revolution is underway."

Based in Geneva, UNEP FI started life in 1992 as a partnership between the UN and the large private financial institutions aimed at helping them understand the links between financial performance, sustainable environments and societies. So far, 180 institutions, including some of the world's largest pension funds, have committed to the organization's principles.

More than 300 large investors representing \$41 trillion (U.S.) in investments have signed up to be part of the carbon disclosure project, another global partnership to assess and broadcast companies' exposure to future costs, opportunities and risks of carbon.

One small slice of the market is in investment in renewable forms of energy, such as wind and solar. It more than doubled in a single year, jumping from \$70 billion (U.S.) in 2006 to \$148 billion (U.S.). The fledgling carbon trading market did the same, bounding from \$30 billion (U.S.) to \$64 billion (U.S.) over the same period.

Now companies such as Trucost plc, founded in 2000, have sprung up to measure an institution's investments according to their carbon footprint. This way, shareholders know how green the portfolio is and may alter it if they wish to, often without dropping rates of return.

"For so long, green finance was seen as a risk," says Clements-Hunt. "Now it's flipped. It's not just about risk; these are the markets of the future."



▲ (Left) Paul Clements-Hunt, head of UNEP FI's Finance Initiative and (Right) Mark Halle, IISD Director of Trade and Investment.

It's a building block of sustainable finance.

The green finance trend has been set in motion by several factors says Clements-Hunt. First, carbon markets have been set up, establishing the principle that carbon is a commodity and can spin a profit or loss. Since the Asian market crash of 1997, a number of crashes in world financial markets have also set in.

Today, it's the sub-prime debacle, whose effects continue to ripple through world economies. These, plus a series of crises of business governance have shocked the investment world, wiping massive amounts of value off stocks and bonds from risks that had flown below the radar. According to Clements-Hunt, this combination has heightened institutional investors' perception of risk and broadened what they consider to be risk.

"This begins to shape and change how risk is viewed," he continues.

This is why UNEP FI commissioned a heavyweight legal interpretation that, in effect, says institutional investors have a fiduciary duty to take into account factors such as carbon exposure that either materially affects potential returns or that will affect them. According to Clements-Hunt, "It sent a seismic shiver through the institutional investment world," he says.

Then, reports by former World Bank economist Sir Nicholas Stern solidified the idea that the financial risks of failing to deal with climate change could be severe, and that profits from emerging green technologies and financial instruments could be large.

"For so long, green finance was seen as a risk," says Clements-Hunt. "Now it's flipped. It's not just about risk; these are the markets of the future."

Clements-Hunt notes that the Norwegian government pension fund, third largest in the world, has begun proactively investing in projects with environmental and ethical chops, and has increased its allocation of investments in environmental technology.

What's the point of involving the institutional billions in green markets? For one thing, public finance can't cope with the huge infusion of cash needed to help the world adapt to climate change, such as more robust infrastructure to keep away floods.

"The markets are the critical economic lever," Clements-Hunt points out. "If we don't have the financial and capital markets working in the right direction to underwrite and finance new investment, it's all just chatter."

Still, the green finance phenomenon has a few leagues still to go, says Mark Halle, IISD's head of trade and investment. In his eyes, "All the incentives and disincentives are against it."

A key structural barrier is that much institutional investing is done by computers and is based solely on a stock's rating, not on its degree of green. And rating agencies don't look at sustainability measures.

A prime example of the current separation between profit and social good is the investing practices of foundations such as the Bill and Melinda Gates Foundation, the largest in the world, says Halle. The side that makes money for the foundation deliberately

does not target social ends, but rather profitable ones. It leaves the social works to the giving side.

Halle's work is aimed at changing this type of thinking by encouraging development of sustainable and ethical investments as an asset class that can make money. His work has shown that innovation and experimentation in this type of financial instrument is already strong. As he sees it, "If the market wanted to set up these instruments it could happen overnight. That would make all the difference."

For more information about Mark Halle's trade and investment work, visit www.iisd.org and for more about UNEP FI, visit www.unepfi.org



"If we don't have the financial and capital markets working in the right direction to underwrite and finance new investment, it's all just chatter."



Sustainability Q+A:

Make Room for Big Room, Inc.



▲ (Left) Trevor Bowden and (Right) Jacob Malthouse

Jacob Malthouse and Trevor Bowden are the first of IISD's over 300 youth intern alumni to set up their own business. Big Room Inc., based in Vancouver, uses the Internet to help people make green choices by giving them better information.

Jacob and Trevor completed their internships in Geneva with UNEP FI (Please See Green Finance on page 6). The pair believes that partnerships have power to deliver results if executed efficiently and humbly. They also have faith in the ability of small, nimble teams to drive change—as *The Innovator* interviewed them in September.

Q: Where do you see the trends going internationally in sustainable development?

JM I see a better understanding of 'what is green'. As this understanding matures, the idea of 'green' will become more integrated into making decisions.

TB As that happens, measurement becomes key. We have to establish targets, capture data, set new targets. This is some of the hard, unsexy work in sustainability: lots of crunching numbers from ropey measurement systems. But it will get better.

Q: Why did you set up Big Room?

JM We saw an opportunity to link our common interests: Internet geekery and eco-friendliness along with the skills we gained during our IISD internships at UNEP FI—especially around the importance of transparency and standards in markets.

TB We also want to try our hand at running a business! We're not a charity. We think the data and services we provide can put food in our mouths and a roof over our heads!

For more information about Jacob and Trevor's new green business, visit <http://bigroom.ca/> or ecolabelling.org ● ●

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