

# Northern Climate Exchange

*Independent Information - Shared Understanding - Action on Climate Change*

NCE Update July 20, 2011

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## Announcements

### 1. Climate Condoms

Is climate change making you hot? NCE has partnered with Yukon government department of Health and Social Services to create "Climate Condoms." NCE is hosting a contest to choose the best sexy-climate change phrases which will then be sent to Health and Social Services to be the 2012 spring condoms!

These condoms will be distributed in time for Earth Day and the Haines to Haines bike relay next spring. Check out the Climate Condoms Facebook page and submit your phrases by searching for "Climate Condoms" on Facebook or by following the link on the Yukon College Facebook page.

The Climate Condoms page will be launched on **Friday, July 22nd**-see the page for rules and deadlines!

### 2. Fireweed Community Market and Permafrost Fun!

Join NCE at the Fireweed Community Market on *August 4th and 11th* for some permafrost fun! We will be doing a thawing permafrost demonstration both evenings involving ice cream, candy, and a few vegetables (yes, you can eat it afterward!)

This is a great opportunity to interest your kids in climate change-or even to learn something yourself! There will also be complimentary beverages and a wealth of information about NCE projects and initiatives. We look forward to seeing you there!



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2010-11

## Articles

### 1. National energy strategy on agenda at Alberta talks

July 18, 2011  
CBC News

A national energy strategy is high on the agenda at a meeting of federal and provincial energy ministers in Kananaskis, which runs until Tuesday. Canada needs to reach more markets with its energy resources, said Alberta Energy Minister Ron Liepert.

A comprehensive energy strategy would provide a road map for energy priorities, including the development of pipelines and port facilities, which could allow exports to reach more countries than the U.S., he said.

"If we're going to be a global energy superpower then we better find ways to get our product to markets globally. Currently, we only really have one customer and that's south. And you're not going to be a global energy superpower with one customer. So to me, that's a natural starting point," Liepert said.

With a majority Conservative government in Ottawa, Alberta's goal of achieving a national energy strategy is now within reach, Liepert said.

"The impression that I have received is that there is a recognition that we need to move in this direction. So I think it is going to make it much easier to get a consensus," he said.

While Oliver says a shared vision for energy is key to Canada's long-term future as an energy superpower, he said the federal government will respect provincial jurisdiction and seek a collaborative approach.

"We are in favour - strongly in favour - of a collaborative approach between the federal government and the provinces," he said.

National guidelines for energy development and a new commitment to opening up new markets could result in a concerted push to construct the contentious Northern Gateway pipeline.

The project would carry oilsands crude from Alberta to the west coast where it would then be shipped to growing eastern markets, such as China.

But several First Nations groups are trying to kill the project because they believe it threatens their wildlife habitats.

Federal Minister of Natural Resources Joe Oliver said his government supports the project. "Gateway in our opinion is in the national interest," he said.

### Ministers tour oilsands

The ministers flew to Calgary after touring oilsands sites near Fort McMurray on Monday.

Liepert said it was a good chance for his fellow ministers to learn first-hand about the oilsands, which the federal Conservative government has called a key driver of the national economy.

But environmental groups have questioned the legitimacy of the talks.

Gillian Mceachern, a spokeswoman with Environmental Defence said it's problematic that several oil companies helped to sponsor the Kananaskis gathering.

"That caused quite a bit of concern for us. It does create the perception that they might be buying their way into agreement with what they want," she said.

A national energy strategy should focus on transitioning away from fossil fuels towards renewable energy, and environmental groups should be at the negotiating table, she said.

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## 2. Arctic may be ice-free within 30 years

By John Vidal  
July 11, 2011  
The Guardian

Sea ice in the Arctic is melting at a record pace this year, suggesting warming at the north pole is speeding up and a largely ice-free Arctic can be expected in summer months within 30 years.

The area of the Arctic ocean at least 15% covered in ice is this week about 8.5m sq kilometres - lower than the previous record low set in 2007 - according to satellite monitoring by the US National Snow and Ice Data Centre (NSIDC) in Boulder, Colorado. In addition, new data from the University of Washington Polar Science Centre, shows that the thickness of Arctic ice this year is also the lowest on record.

In the past 10 days, the Arctic ocean has been losing as much as 150,000 square kilometres of sea a day, said Mark Serreze, director of the NSIDC.

"The extent [of the ice cover] is going down, but it is also thinning. So a weather pattern that formerly would melt some ice, now gets rid of much more. There will be ups and downs, but we are on track to see an ice-free summer by 2030. It is an overall downward spiral."

Global warming has been melting Arctic sea ice for the past 30 years at a rate of about 3% per decade on average. But the two new data sets suggest that, if current trends continue, a largely ice-free Arctic in summer months is likely within 30 years. That is up to 40 years earlier than was anticipated in the last Intergovernmental Panel on Climate Change (IPCC) assessment report.

Sea ice, which is at its maximum extent in March and its lowest in September each year, is widely considered to be one of the "canaries in the mine" for climate change, because the poles are heating up faster than anywhere else on Earth. According to NSIDC, air temperatures for June 2011 were between 1 and 4C warmer than average over most of the Arctic Ocean.

The findings support a recent study in the journal *Science* that suggested water flowing from the Atlantic into the Arctic ocean is warmer today than at any time in the past 2,000 years and could be one of the explanations for the rapid sea ice melt now being observed.

Computer simulations performed by Nasa suggest that the retreat of Arctic sea ice will not continue at a constant rate. Instead the simulations show a series of abrupt decreases such as the one that occurred in 2007, when a "perfect storm" of weather conditions coincided and more ice was lost in one year than in the

previous 28 years combined. Compared to the 1950s, over half of the Arctic sea ice had disappeared.

What concerns polar scientists is that thicker ice which does not melt in the summer is not being formed fast as the ice is melting. On average each year about half of the first year ice, formed between September and March, melts during the following summer. This year, says Jeff Masters, founder of the Weather Underground climate monitoring website, a high pressure system centred north of Alaska has brought clear skies and plenty of ice-melting sunshine to the Arctic.

"The combined action of the clockwise flow of air around the high and counter-clockwise flow of air around a low pressure system near the western coast of Siberia is driving warm, southerly winds into the Arctic that is pushing ice away from the coast of Siberia, encouraging further melting."

Sea ice has an important effect on the heat balance of the polar oceans, since it insulates the (relatively) warm ocean from the much colder air above, thus reducing heat loss from the oceans. Sea ice also has a high albedo - about 0.6 when bare, and about 0.8 when covered with snow - compared to the sea - about 0.15 - and thus the loss of sea ice increased the absorption of the sun's warmth by the sea.

[www.guardian.co.uk](http://www.guardian.co.uk)

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### 3. Marathon swims for polar bears as ice melts

By Kieran Mulvaney  
July 19, 2011  
Discovery News

At least in comparison to their bear brethren, polar bears are renowned as accomplished swimmers. Their massive front paws, ideal for swatting seals, also make powerful paddles. Their elongated necks allow them to keep their heads above water. And their blubber adds buoyancy and warmth.

But they are designed for brief dips, not aquatic marathons. In an ideal world, a polar bear would enter the water to travel a short distance between ice floes, or to sneak up on an unsuspecting resting seal. Although they can swim longer distances, they generally do so at a cost. In the book *The Last Polar Bear*, journalist Charles Wohlforth quotes biologist Craig George, who recounted an incident when a polar bear mother and two cubs, having swum ashore near Barrow, Alaska, had no energy remaining to move another inch:

"So there she lay with her cubs for two days, barely moving a muscle. Hundreds of vehicles surrounded her day and night; the little family was quite the spectacle ... Finally, after two days of comatose rest, she slowly got up and ambled up the coast with her cubs to spend the rest of the fall on the tundra."

Empirical evidence of the toll of long range swimming on polar bears has been harder to come by, although a study published earlier this year detailed a polar bear mother that swam for 232 consecutive hours in search of pack ice, as a result of which she lost 22 percent of her body mass and her cub lost its life.

As polar bears' Arctic sea ice habitat shrinks, could such scenarios become more common? In 2006, two researchers concluded that an apparent increase in the number of polar bears found drowned could be attributed to bears being forced to swim ever-greater distances, and a new study adds support to the notion that less ice means more bears are spending more time in the water, to the particular detriment of their cubs.

The study, being presented today at the International Bear Association Conference in Ottawa, is, in the words of co-author Geoff York of WWF's Arctic Program, "the first analysis to identify a significant multi-year trend of increased long-distance swimming by polar bears." York and his three co-authors - Anthony Pagano, Kristin Simac and George Durner of the U.S. Geological Survey's Alaska Science Center - analyzed data from 68 GPS collars fitted on adult female polar bears between 2004 and 2009 and overlaid it with satellite images of sea ice coverage. They found that, over the course of the study, 20 different bears swam distances longer than 50 km (31 miles) during 50 separate occasions. The shortest such journey was 53.7 km (33.3 miles), and the longest, lasting just shy of an almost unfathomable 13 days, was 687.1 km, or 426

miles.

Twelve of the 20 bears had yearling cubs with them at the time they were collared, 11 of which were recaptured or identified at a later date. Five of these 11 had lost their cubs by the time they were re-sighted; that's a 45 percent mortality rate, compared to 18 percent among cubs of bears that did not make long-distance swims.

In most cases, the bears that swam long distances did so from scattered, or unconsolidated sea ice toward either land or the main pack ice. This implies, the authors write, "that bears are becoming stranded while using unconsolidated sea ice and are forced to swim to reach more stable habitats." Furthermore, they may be doing so more frequently: 25 of the 50 swimming events took place in 2009 alone. The authors caution that the number of GPS collars, and the quality and quantity of data each collar could generate, also increased over that time, but the proportion of collared bears that underwent lengthy swims showed "an increasing and significant linear trend" from 25 percent in 2003 to 62 percent in 2009.

Polar bears are being forced "to swim longer distances to find food and habitat," says York. "Climate change is pulling the sea ice out from under polar bears' feet."

[www.news.discovery.com](http://www.news.discovery.com)

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#### 4. Warming temperatures raise questions of water supply in village

By Alex DeMarban  
July 8, 2011  
The Arctic Sounder

The dropping Noatak River is becoming more difficult to navigate and could threaten the water supply in an Inupiaq village, according to a report on climate change issued by the nation's largest tribal health system.

Noatak, a village of 500, is the latest to see the spotlight in a series of studies conducted by the Alaska Native Tribal Health Consortium, which is visiting some Northwest Alaska communities to learn about the impacts of warming temperatures.

The health system's Center for Climate and Health has previously issued such reports on Point Hope and Kivalina.

Average temperatures in the village northwest of Kotzebue are higher each month than 50 years ago, the report said. The warmer temperatures mean the river, the main travel corridor into the village, is shallower. And its ice is less stable in winter, creating more risk for snowmachiners.

The village gets its water from shallow wells in the river and the primary well has sometimes gone dry. That's a problem because there's no other "known alternative," the report notes.

The Center for Climate and Health produced the federally-funded report, working with the Maniilaq Association, the Northwest Arctic Borough and the Noatak Traditional Council.

To read more about the changes in Noatak, find the report [here](#).

[www.arcticsounder.com](http://www.arcticsounder.com)

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#### 5. An era of tornadoes: how global warming causes wild winds

By Paul Epstein  
July 8, 2011

## The Atlantic

*Destruction in Missouri and elsewhere offers a taste of increasingly extreme weather. Part one in a four-part series on climate change.*

Too hot, too cold, too rainy, too dry, too windy. The operative word is "too," and it is the exaggeration of normal weather events that defines the changing climate.

Close to home (for me, at least), Massachusetts towns have been hit with deadly tornadoes. In Joplin, Missouri, hospitalized patients were sucked out of emergency room windows. The consequences will remain with these communities and many others for decades, and the images will stay with all of us. In their wake, many are asking: Is the intensity of these twisters associated with a changing climate?

The picture on tornadoes is not straightforward, for this uptick in severe twisters is a new phenomenon. And the future may hold ups and downs in their frequency. But the recent series of severe and lethal tornadoes are part of a global trend toward more severe storms.

First, extremes in general.

Recent studies published in *Nature* and *Science* conclude that extreme weather events (heavy rainfall events and heatwave intensity) are linked to climate change. And the heat buildup in the deep ocean helps explain why.

Since the 1950s, the world's oceans have accumulated close to 95 percent of all the additional heat related to global warming. Because warm ocean surfaces evaporate faster than cool ones and the warmed atmosphere holds more water vapor, the warming and water vapor fuel storms. (MIT climate modeler Kerry Emanuel, for example, has demonstrated that Hurricane Katrina would not have been as strong as it was in 2005 if it had occurred in 1980, when the atmosphere and sea surfaces were cooler.)

So global warming is thus causing climate change, including altered weather patterns, and the engine of change is the heat building up deep inside the world's oceans. Water is warming, ice is melting, and water vapor is rising. How does this help explain tornadoes?

For tornadoes, we have clear ideas on how they form and have some idea about how their strength may be linked to global warming.

It's all about contrasts and gradients. Warmer temperatures over land surfaces create low-pressure systems (since hot air rises, creating "lows"), while cold fronts from the north come with high pressures. Weather "flows downhill," as it were—from highs to lows. When temperature and pressure gradients between highs and lows increase (as they do naturally in spring), the clash can twist to form tornadoes. The greater the contrasts, the greater the force of the twisters.

This spring, especially warm and moisture-laden air from the Gulf of Mexico met up with especially cold fronts from the north, driven by melting Arctic and Greenland ice. (Between 2004-06 and 2007-09, the rate of ice mass loss in the Canadian Arctic Archipelago sped up threefold.)

Warmer air and warmer seas are melting Arctic ice, and the shrinkage has changed North Polar air circulation—allowing "leakage" of cold air outside the Arctic Circle. Cold fronts previously contained within the polar vortex are now slipping out (driving severe winter weather in the U.S. and Europe in the past two years), and melting Arctic ice has also altered the path of the branches of the jet stream. Cold, fresh melt water from the Arctic has set up a blocking high-pressure area in the Atlantic off the Northeast for most of the past 18 months, altering the movement of weather fronts—sometimes hastening them, sometimes stalling them.

In addition, winds have changed globally over the past half-century. Westerly winds have increased in both hemispheres, more so in the south (affecting Australia's weather). These changes in global circulation patterns have climate scientists very worried.

This is complicated, and there are a lot of moving parts. Global warming is affecting many components of the global climate simultaneously, and the result is an increasing propensity for severe storms and other

weather extremes.

When scientists are asked about the connections, they've carefully responded that "no one event is diagnostic of climate change." But, as Kevin Trenberth, the head of the climate analysis section of the National Center for Atmospheric Research, explains, questioning whether singular incidents are or are not caused by climate change misses the point. The climate is changing, and all weather events occur in the context of natural variability and the changing climate.

The same set of conditions will not be repeated each year-and tornadoes, like hurricanes, will not increase each year. And the precise dynamics described are open to discussion. But it is clear that changing atmospheric and oceanic conditions underlie the changing patterns of weather-and that the stage is set for more severe storms, including even more punishing tornadoes.

[www.theatlantic.com](http://www.theatlantic.com)

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## 6. China's pollution temporarily slowed climate change

July 5, 2011

CBC News

A cyclist pushes a bike near a coal-fired power plant in Changchun, in northeast China's Jilin province in 2010. Chinese coal consumption doubled between 2003 and 2007. Associated Press Scientists have come up with a possible explanation for why the rise in Earth's temperature paused for a bit during the 2000s, one of the hottest decades on record.

The answer seems counterintuitive. It's all that sulphur pollution in the air from China's massive coal-burning, according to a new study.

Sulphur particles in the air deflect the sun's rays and can temporarily cool things down a bit. That can happen even as coal-burning produces the carbon dioxide that contributes to global warming.

"People normally just focus on the warming effect of CO<sub>2</sub> (carbon dioxide), but during the Chinese economic expansion there was a huge increase in sulphur emissions," which have a cooling effect, explained Robert K. Kaufmann of Boston University. He's the lead author of the study published Monday in Proceedings of the National Academy of Sciences.

But sulphur's cooling effect is only temporary, while the carbon dioxide from coal burning stays in Earth's atmosphere a long time.

Chinese coal consumption doubled between 2003 and 2007, and that caused a 26 per cent increase in global coal consumption, Kaufmann said.

Now, Chinese leaders have recognized the effects of that pollution on their environment and their citizens' health and are installing equipment to scrub out the sulphur particles, Kaufmann said.

### **Sulphur's effects short-lived**

Sulphur quickly drops out of the air if it is not replenished, while carbon dioxide remains for a long time, so its warming effects are beginning to be visible again, he noted. The plateau in temperature growth disappeared in 2009 and 2010, when temperatures lurched upward.

Indeed, NASA and the National Oceanic and Atmospheric Administration, have listed 2010 as tied for the warmest year on record, while the Hadley Center of the British Meteorological Office lists it as second warmest, after 1998.

Sulphur's ability to cool things down has led some to suggest using it in a geoengineering feat to cool the planet. The idea is that injecting sulphur compounds very high into the atmosphere might help ease global warming by increasing clouds and haze that would reflect sunlight. Some research has concluded that's a bad idea.

Using enough sulphur to reduce warming would wipe out the protective Arctic ozone layer and delay recovery of the Antarctic ozone hole by as much as 70 years, according to an analysis by Simone Tilmes of the National Center for Atmospheric Research in Boulder, Colorado. This is the ozone layer that is high above Earth and protects against harmful UV rays, not the ground level ozone that is a harmful pollutant.

"While climate change is a major threat, more research is required before society attempts global geoengineering solutions," said Tilmes.

Overall, global temperatures have been increasing for more than a century since the industrial revolution began adding gases like carbon dioxide to the air. But there have been similar plateaus, such as during the post-World War II era when industrial production boosted sulphur emissions in several parts of the world, Kaufmann explained.

Atmospheric scientists and environmentalists are concerned that continued rising temperatures could have serious impacts worldwide, ranging from drought in some areas, changes in storm patterns, spread of tropical diseases and rising sea levels.

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