



Northern Climate ExChange

Independent Information - Shared Understanding - Action on Climate Change

NCE Update June 24, 2009



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Announcements

1. Pedal for the Planet - Whitehorse kick off June 26

If you are concerned about climate change, come out and join 17 year old Malkolm Boothroyd at the kickoff rally for his "Pedal for the Planet". Malkolm will be cycling from Whitehorse, Yukon towards Ottawa, Ontario as part of "C2C", Pedal for the Planet.

The kickoff event will take place on Friday June 26 at 5 pm. at Rotary Park in Whitehorse. This will be followed by a short walk or bike ride.

Please come to help raise support for climate change action!

Malkolm and his group plan to arrive at Parliament for the beginning of the fall session where they will urge governments to take bolder action on climate change".

2. Global Climate Change Impacts in the United States - June 16

The Global Climate Change Impacts in the United States Report released on June 16, summarizes the science and the impacts of climate change on the United States, now and in the future. It focuses on climate change impacts in different regions of the U.S. and on various aspects of society and the economy such as energy, water, agriculture, and health. It's also a report written in plain language, with the goal of better informing public and private decision making at all levels.

[Download the Report](#)

www.globalchange.gov



3. The Arctic Climate Change and Security Policy Conference: Final Report and Findings

The accelerating pace of climate change, increasing competition over resources, and new territorial claims demand that greater attention be paid to the Arctic. As the most immediate and serious threat to the region, minimizing the environmental impact of climate change and resource development must be the top priority, according to a report from the Carnegie Endowment, the University of the Arctic, and Dartmouth College.

[Download report and findings.](#)

4. Synthesis Report: Climate Change: Global Risks, Challenges & Decisions

The Synthesis Report summarises new knowledge that was presented at the congress "Climate Change: Global Risks, Challenges & Decisions" at the University of Copenhagen in March this year. Approximately 2500 people from nearly 80 countries attended the congress with over 1400 scientific presentations.

The Synthesis Report was launched at a press conference in Bruxelles, Belgium, on June 18, 2009, where it was handed over to the host of COP-15, the Danish Prime Minister Mr. Lars Løkke Rasmussen.

[Download Synthesis Report](#)

www.climatecongress.ku.dk

5. Climate Change, Wildlife, and Wildlands Toolkit

The US Environmental Protection Agency has published an important tool for educators who need teaching materials related to Climate Change, Wildlife, and related environmental topics. The new Climate Change, Wildlife and Wildlands Toolkit for Formal and Informal Educators is an updated and expanded version of the Climate Change, Wildlife and Wildlands Toolkit for Teachers and Interpreters first published in 2001.

The new kit is designed for classroom teachers and informal educators in parks, refuges, forest lands, nature centers, zoos, aquariums, science centers, etc., and is aimed at the middle school grade level.

[Click here to see the on-line Toolkit.](#)

www.epa.gov/climatechange

Articles

1. Study warns of cataclysmic melting of glaciers

By Randy Boswell,
Canwest News Service
June 22, 2009

It's a little-known natural wonder along Baffin Island's rugged east coast, a spectacular, 110-km-long channel lined by towering cliffs that - despite its extreme remoteness - is a mecca for base-jumping enthusiasts from around the world.

But U.S. scientists who have reconstructed a cataclysmic glacial meltdown in prehistoric Canada say Nunavut's Sam Ford Fiord is also a sentinel of danger in the age of climate change, showing just how quickly the planet's massive coastal glaciers could disappear and send global sea levels surging.

Their study, published this week in the journal Nature Geoscience, says the rapid melting of the fiord's colossal, kilometre-deep glacier about 9,500 years ago is proof that similar features found today in Greenland, Canada and Antarctica could be lost "in a geologic instant."

That's several decades or even a few centuries in ordinary time - but fast enough that the scientists, led by State University of New York geologist Jason Briner, are sounding an alarm about the present-day implications.

"A lot of glaciers in Antarctica and Greenland are characteristic of the one we studied in the Canadian Arctic," Buffalo-based Briner states in a summary of the study, which presents evidence the Baffin Island glacier retreated at rates of up to 58 metres a year near the close of the last ice age.

"If modern glaciers do this for several decades, this would rapidly raise global sea level, intercepting coastal populations and requiring vast re-engineering of levees and other mitigation systems."

Many of the fiords with the world's largest coastal glaciers today are "strikingly analogous" to Sam Ford at the time of its "rapid deglaciation," Briner and two co-authors state in their Nature Geoscience article. "Thus tens to hundreds of kilometres of retreat of present outlet glaciers is possible in the coming centuries."

Researchers around the world are closely monitoring the conditions of ice shelves, glaciers and sea ice in the Earth's southern and northern polar regions.

Rising global temperatures, widely believed to have been fuelled by industrial-age carbon emissions, are generally blamed for accelerating glacial melts and opening long-frozen polar sea routes.

Last summer alone, Canadian scientists recorded the collapse of about one-quarter of the ancient, glacier-fed ice shelves along the north coast of Ellesmere Island.

"Indeed the collapse of ice shelves and the rapid retreat of large ice streams (such as the ancient one at Sam Ford Fiord) are not too dissimilar," Briner said Monday. "But tidewater glaciers like the one studied - and like the hundreds around the world that scientists are really worried about - calve off icebergs, and when they do so quickly, it is collapse-like."

And notably, Briner adds, the rapid calving and retreating of such mammoth coastal glaciers does significantly "contribute to sea-level rise."

www.canada.com

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2. Climate report devotes chapter to Alaska

RISING TEMPS: They are up 3.4 degrees over 50 years.

The Associated Press
Alaska Daily News
June 19th, 2009

JUNEAU -- Alaska merits a chapter in a new White House report on climate change that says temperatures in the state have climbed at twice the rate of the rest of the nation over the last half-century.

The report, a compilation of current science, says annual temperatures have risen 3.4 degrees Fahrenheit in 50 years.

Temperatures are projected to rise another 3.5 to 7 degrees by midcentury.

The report says sea ice is melting, meaning shipping and resource extraction can expand. It says arctic ice could be gone during summers by the end of the century.

The report says that with marine species moving mostly northward, fishermen will have to travel farther. It might be difficult for Alaska Natives to find the walruses and seals they subsist on.

Coastal erosion is increasingly threatening communities, including the villages of Newtok and Shishmaref. The Bering Sea and Alaska's coastline are becoming stormier, throwing off autumn barge delivery schedules and making commercial fishing more dangerous.

Melting permafrost is sinking land, adding as much as \$6.1 billion to costs for publicly owned infrastructure by 2030. In the past three decades, the number of days annually that oil-and-gas-related truckers may travel on tundra ice roads has halved, from 200 to 100.

The average area burned in North American wildfires each year tripled from the 1960s to the 1990s. In Alaska, the wildfire burn area is projected to at least double by midcentury and triple by 2100.

www.adn.com

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3. Arctic Meltdown

CBC Documentary: Three-part series premiering: Saturday June 20, 2009 at 7 pm on CBC-TV

CBC on-line
June, 2009

Narrated by David Suzuki, the three-part series Arctic Meltdown documents the drastic changes the Arctic has seen over the last few years. From new companies rushing to claim the Arctic's plentiful resources to the effect climate change has had on animals as well as plant life, the documentary, directed by Kristina Von Hlatky, asks the big question: as the Arctic meltdown continues at an ever accelerating pace, who will protect it?

In Arctic Meltdown: A Changing World, we see the changes that are upsetting the scientific predictions of the impact of climate change on the Arctic. Now, one sobering forecast is that the Arctic Ocean will be seasonally ice free by the summer of 2013. This possibility is what drives environmentalists to identify ways to minimize the changes affecting this snowy land. But for prospectors like Gordon McCreary, climate change brings new opportunities. He is part of the rush to claim the riches beneath the Arctic's ice: deposits of metals, gold, diamonds, and oil and gas.

Episode one will showcase how Arctic nations are racing to claim control over the Arctic's resources and shipping routes. Dr. Ruth Jackson, from the Bedford Institute of Oceanography in Nova Scotia, leads the Canadian team racing to map the seabed to support Canada's claim. Scientists too are now becoming victims of the Arctic's icy politics. A Canadian-led, international team of researchers is thwarted on camera when their deal to hire a Russian nuclear icebreaker falls through.

Episode 1: Airing Saturday June 20, 2009 at 7 pm on CBC-TV

Arctic Meltdown: The Arctic Passages explores the Northwest Passage and how these dangerous waters are suddenly becoming accessible to businesses and shipping. Ports like Churchill, Manitoba and Murmansk, Russia expect to see business grow in years to come. Until recently, only a few ships braved travel through these ice-strewn waters. More and more ships cross these seas each year and with more traffic come higher risks - in particular for the Inuit who worry about the lack of ports and emergency support.

Episode 2: Airing Saturday June 27, 2009 at 7 pm on CBC-TV

Arctic Meltdown: Adapting to Change, tracks two different Arctics - one that is the storybook land of ice, snow and polar bears and the other that is covered with petroleum plants and pipelines carrying fossil fuels. Bylot Island is a national park and for 20 years a team of Canadian scientists have come every summer to measure the impact of climate change on snowy owls, lemmings, snow geese and Arctic foxes. Here they have discovered that even tiny, hardy plants are being affected, causing a cascade of changes through the ecosystem.

Episode 3: Airing Saturday July 4, 2009 at 7 pm on CBC-TV

www.cbc.ca

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4. Seal virus' spread linked to retreating Arctic ice: scientists

By Randy Boswell
Canwest News Service
June 21, 2009

A team of U.S. scientists has documented the first transmission of a seal-killing virus from the Atlantic Ocean to a population of Pacific sea otters in Alaska - a suspected sign of how melting Arctic sea ice is not only altering animal ranges but also opening new pathways for pathogens.

The findings, detailed in the journal *Emerging Infectious Diseases* published by the U.S. Centers for Disease Control and Prevention, indicate the deadly phocine distemper virus - which killed 30,000 harbour seals in one 2002 outbreak in Northern Europe, and has affected populations on Canada's Atlantic coast - was passed between seal species across Northern Canada or Arctic Eurasia before infecting the otters in Alaska's Kachemak Bay.

Highlighting "the persistent threat of this virus to Atlantic marine mammal populations," the researchers from two California universities and the Alaskan branch of the U.S. Fish and Wildlife Service noted that PDV "had never been identified as the cause of illness or death in the North Pacific Ocean."

But necropsies conducted on dead otters gathered along the Alaskan shore - along with nasal swabs taken from a sampling of live otters - showed the Atlantic virus had somehow struck the Pacific population. The scientists suspect PDV of suppressing the immune systems of the Alaskan otters and, in some cases, allowing a fatal strep infection to set in.

"These results demonstrate that PDV has been introduced to the North Pacific Ocean since 2000," the authors conclude. "All Pacific marine mammal species are now at risk for phocine distemper-induced population decreases."

The researchers also warn that "because terrestrial and marine Arctic species from Canada have previously been exposed to PDV, the risk for predatory and scavenging North Pacific Ocean carnivore species must not be overlooked. All seal species in the Arctic and Pacific Oceans are threatened, especially those with limited numbers, and epidemic management strategies must be in place to protect critically small populations."

Notably, the scientists link the spread of the virus to the recent record-setting retreat of Arctic sea ice - the same phenomenon that is fuelling increased ship traffic in Canada's northern waters, heightened interest in polar oil exploration and a scientific competition between Arctic nations for expanded undersea territory around the North Pole.

"The decrease in sea ice," the study states, "may have affected movement of Arctic seal populations ... This sea ice reduction may have altered seal haulout and migration patterns, resulting in contact between Atlantic, Arctic, and Pacific Ocean species that was not possible" in earlier times.

The discovery comes at a time when biologists are concerned that the polar bear - now listed under U.S. endangered species legislation - and other northern creatures face serious threats as melting ice reshapes their habitats.

Just a year ago, a team of U.S. scientists - in a *Science* magazine article entitled *The Coming Arctic Invasion* - said Canada should brace for an invasion of Pacific Ocean species along its Arctic and Atlantic coasts. They wrote that warmer waters and ice-free conditions were likely to reopen a migration route for sea creatures that has been closed for more than three million years.

That study warned that along with the "poleward expansion" of some southern species - highlighted in

Canada by reports of grizzly bears encroaching on polar bear habitat - "an even more dramatic inter-oceanic invasion will ensue in the Arctic: North Pacific lineages will resume spreading through the Bering Strait into a warmer Arctic Ocean and eventually into the temperate North Atlantic."

The researchers documented a similar trans-Arctic migration about 3.5 million years ago when a warm period created favourable feeding conditions for primitive mollusks and other marine creatures that moved eastward from the Bering Sea to colonize the Arctic and eventually the Atlantic Ocean.

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5. Copenhagen Climate Report: "Inaction is inexcusable"

Key climate indicators such as global mean surface temperature, sea-level rise and extreme climatic events are already moving beyond the patterns of natural variability within which contemporary society and economy have developed. This is one of the key messages of a report presented by leading scientists in Brussels today in preparation for the United Nations Climate Change Conference in Copenhagen in December. The up-to-date overview of research relevant to climate change was handed over to the Danish Prime Minister Lars Løkke Rasmussen, the host of the conference.

By Patrick Eickemeier
Potsdam Institute for Climate Impact Research
June 19, 2009

"We have covered new findings on climate science, climate impacts on society and the environment, and effective tools and approaches to deal with these challenges," says Hans Joachim Schellnhuber, director of the Potsdam Institute for Climate Impact Research (PIK) and member of the writing team. "The scientific findings presented in this update create by themselves a sense of urgency that we hope will lead the Copenhagen conference to success," says Schellnhuber, who advises the German government on global change issues. In Copenhagen a follow-up to the Kyoto protocol will be debated.

The Synthesis Report summarises new knowledge that was presented at the congress "Climate Change: Global Risks, Challenges & Decisions" at the University of Copenhagen in March this year. Approximately 2500 people from nearly 80 countries attended the congress with over 1400 scientific presentations. "The bottom line is that limiting global warming to a manageable extent will require all our ingenuity for the climate-smart evolution of existing structures," says Schellnhuber. Yet large-scale transformational measures would also be needed.

For example, the current planetary land-use pattern is the result of erratic historical processes. These were blind to global sustainability considerations, Schellnhuber and Veronika Huber from PIK point out in the report. Future land-use must accommodate the demands of some nine billion people for food and fibre, energy, infrastructures and conservation - on a non-expandable global surface.

Analyses led by PIK indicate that twelve billion people could be nourished on less than one third of the present agricultural area, if the best sites were used for the most appropriate crops and if world food trade would operate undistorted by protectionism. This bold approach would only become feasible, however, if the prime locations (as shown in the figure) were reserved for agriculture as part of a long-term global deal - in the same way as the tropical rainforests hopefully will be earmarked for conservation as part of the global commons.

"If humanity is to learn from history and to limit these threats [of anthropogenic climate change], the time has come for stronger control of the human activities that are changing the fundamental conditions for life on Earth," the writing team states in the Synthesis Report. To decide on effective control measures, an understanding of how human activities are changing the climate, and of the implications of unchecked climate change, needs to be widespread among world and national leaders, as well as among the public. The report communicates this understanding through six key messages:

Key Message 1: Climatic Trends

Recent observations show that greenhouse gas emissions and many aspects of the climate are changing

near the upper boundary of the IPCC range of projections. Many key climate indicators are already moving beyond the patterns of natural variability within which contemporary society and economy have developed and thrived. These indicators include global mean surface temperature, sea-level rise, global ocean temperature, Arctic sea ice extent, ocean acidification, and extreme climatic events. With unabated emissions, many trends in climate will likely accelerate, leading to an increasing risk of abrupt or irreversible climatic shifts.

Key Message 2: Social and environmental disruption

The research community provides much information to support discussions on "dangerous climate change". Recent observations show that societies and ecosystems are highly vulnerable to even modest levels of climate change, with poor nations and communities, ecosystem services and biodiversity particularly at risk. Temperature rises above 2°C will be difficult for contemporary societies to cope with, and are likely to cause major societal and environmental disruptions through the rest of the century and beyond.

Key Message 3: Long-term strategy - Global Targets and Timetables

Rapid, sustained, and effective mitigation based on coordinated global and regional action is required to avoid "dangerous climate change" regardless of how it is defined. Weaker targets for 2020 increase the risk of serious impacts, including the crossing of tipping points, and make the task of meeting 2050 targets more difficult and costly. Setting a credible long-term price for carbon and the adoption of policies that promote energy efficiency and low-carbon technologies are central to effective mitigation.

Key Message 4: Equity Dimensions

Climate change is having, and will have, strongly differential effects on people within and between countries and regions, on this generation and future generations, and on human societies and the natural world. An effective, well-funded adaptation safety net is required for those people least capable of coping with climate change impacts, and equitable mitigation strategies are needed to protect the poor and most vulnerable. Tackling climate change should be seen as integral to the broader goals of enhancing socioeconomic development and equity throughout the world.

Key Message 5: Inaction is inexcusable

Society already has many tools and approaches - economic, technological, behavioural, and managerial - to deal effectively with the climate change challenge. If these tools are not vigorously and widely implemented, adaptation to the unavoidable climate change and the societal transformation required to decarbonise economies will not be achieved. A wide range of benefits will flow from a concerted effort to achieve effective and rapid adaptation and mitigation. These include job growth in the sustainable energy sector; reductions in the health, social, economic and environmental costs of climate change; and the repair of ecosystems and revitalisation of ecosystem services.

Key Message 6: Meeting the Challenge

If the societal transformation required to meet the climate change challenge is to be achieved, then a number of significant constraints must be overcome and critical opportunities seized. These include reducing inertia in social and economic systems; building on a growing public desire for governments to act on climate change; reducing activities that increase greenhouse gas emissions and reduce resilience (e.g. subsidies); and enabling the shifts from ineffective governance and weak institutions to innovative leadership in government, the private sector and civil society. Linking climate change with broader sustainable consumption and production concerns, human rights issues and democratic values is crucial for shifting societies towards more sustainable development pathways.

Synthesis Report "Climate Change: Global Risks, Challenges & Decisions" (pdf-file)

www.pik-potsdam.de

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6. New framework to link up Europe's polar research

European Science Foundation
June 24, 2009

More than 26 leading scientific institutions across Europe are signing up to closer research cooperation

through a new European Polar Framework agreement today in Brussels. The framework agreement is a major outcome from the four-year EUROPOLAR ERA-NET initiative, funded by the European Commission under Framework Programme 6, which ended in February this year.

The framework aims to streamline links between the many national research programmes in the Arctic and Antarctic, led by the European Science Foundation (ESF) European Polar Board. It will make it easier for agencies to launch joint funding calls, share scientific data and for countries to host scientists in each others' research stations, creating international teams similar to those in the International Space Station and the Integrated Ocean Drilling Programme.

Signatures for the agreement come from organisations involved in financing, organising or conducting polar research, including national programme authorities, research funders and polar institutes.

"Recent environmental shifts in the Poles have been large and rapid. By linking together Europe's polar research more closely we can get a better grasp on the wide-ranging series of changes taking place," said Dr Paul Egerton, Executive Director of the ESF European Polar Board, an international committee of leaders of polar programmes hosted by the ESF.

He continues: "This flexible, open agreement will improve cooperation between countries. It will also help implement key recommendations of last year's European Commission Arctic Communication Paper. An international network of polar observatories could be one outcome of this cooperation. Joined-up observations will help predict the course, magnitude and consequences of future changes, enabling us to create adaptable responses to them."

In addition to improving links between existing observatories in the Arctic and Antarctic, the new framework includes commitments to collaborate on new multinational research initiatives and to converge national polar programmes where appropriate. For example, invitations for research proposals would focus on answering questions with global or European relevance, around topics such as life and bio-systems in extreme environments.

The Polar Regions react more rapidly and intensely to global changes than any other part of the planet. Shrinking Arctic sea-ice cover, potentially opening new sea lanes to the north of Eurasia and North America, and the calving of vast table icebergs from the Antarctic ice shelves are the latest examples of these changes.

Much of the information needed to understand these events can only be collected by dedicated research vessels, from permanently manned stations or during multidisciplinary expeditions with considerable logistical demands. These complex interdisciplinary experiments demand closer international cooperation.

The ESF European Polar Board is also coordinating the world's biggest Arctic project: ERICON Aurora Borealis, Europe's Arctic flagship. The €800 million research icebreaker will be the world's first international ship and will be a unique platform for ocean observations to understand all aspects of global change from the seabed to the atmosphere.

www.esf.org

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7. Sediment Yields Climate Record For Past Half-Million Years

TerraDaily
June 23, 2009

Researchers have used sediment from the deep ocean bottom to reconstruct a record of ancient climate that dates back more than the last half-million years. The record, trapped within the top 20 meters (65.6 feet) of a 400-meter (1,312-foot) sediment core drilled in 2005 in the North Atlantic Ocean by the Integrated Ocean Drilling Program, gives new information about the four glacial cycles that occurred during that period.

The new research was presented June 15 at the Chapman Conference on Abrupt Climate Change at Ohio

State University's Byrd Polar Research Center. The meeting is jointly sponsored by the American Geophysical Union and the National Science Foundation.

Harunur Rashid, a post-doctoral fellow at the Byrd Center, explained that experts have been trying to capture a longer climate record for this part of the ocean for nearly a half-century. "We've now generated a climate record from this core that has a very high temporal resolution, one that is decipherable at increments of 100 to 300 years," he said.

While climate records from ice cores can show resolutions with individual annual layers, ocean sediment cores are greatly compressed with resolutions sometimes no finer than millennia "What we have is unprecedented among marine records."

Dating methods such as carbon-14 are useless beyond 30,000 years or so, he said, so Rashid and his colleagues used the ratio of the isotopes oxygen-16 to oxygen-18 as a proxy for temperature in the records. The isotopes were stored in the remains of tiny sea creatures that fell to the ocean bottom over time.

When the researchers compared their record of past climate from the North Atlantic to a similar record taken from an ice core drilled from Dome C in Antarctica, they found it was remarkably similar.

"You can't miss the similarity between the two records, one from the bottom of the North Atlantic Ocean and the other from Antarctica," he said. "The record is virtually the same regardless of the location."

Surprisingly, Rashid's team was also able to score another first with their analysis of this sediment core - a record of the temperature at the sea surface in the North Atlantic.

They drew on knowledge readily known to chemists that the amount of magnesium trapped in calcite crystals can indicate the temperatures at which the crystals formed. The more magnesium present, the warmer the waters were when the tiny organisms were alive.

They applied this analysis to the remains of the benthic organisms in the cores and were able to develop a record of warming and cooling of the sea surface in the North Atlantic for the last half-million years.

Having this information will be useful as scientists try to understand how quickly the major ocean currents shifted as glacial cycles came and went, Rashid said.

The researchers were also able to gauge the extent of the ancient Laurentide Ice Sheet that covered much of North America during the last 130,000 years.

As that ice sheet calved off icebergs into the Atlantic, Rashid said that the "dirty underbelly" of those icebergs carried gravel out into the ocean. As the bergs melted, the debris fell to the bottom and of the ocean floor. The more debris present, the more icebergs had been released to carry it, meaning that the ice sheet itself had to have been larger.

"Based on this, we've determined that the Laurentide Ice Sheet was probably largest during the last glacial cycle than it was during any of the three previous cycles," he said.

During the last glacial cycle, the Laurentide Ice Sheet was more than a kilometer (.6 miles) thick and extended to several miles north of Ohio State.

Along with Rashid, researchers from the University of South Florida, the University of Bremen in Germany, and the Laboratorio Nacional de Energia e Geologia in Portugal contributed to the work.

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8. Toronto team completes Canada's most powerful supercomputer

June 18, 2009

A supercomputer that can complete more than 300 trillion calculations per second - the most powerful in Canada - has been completed at the University of Toronto's SciNet facility.

The IBM iDataPlex cluster computer would be one of the top 15 most powerful supercomputers in the world, based on the online Top 500 list, said a release Thursday announcing the supercomputer's completion.

The project was a collaboration between SciNet, IBM Corp. and Compute Canada, an umbrella group that represents academic high-performance computing groups across the country.

Researchers hope to use the machine's vast computing power to:

- Analyze data from the Large Hadron Collider, the world's most powerful particle accelerator.
- Analyze high-resolution climate change models, including ones that predict the decrease in Arctic sea ice and regional climate change predictions from Ontario and the Great Lakes watershed region.
- Conduct research on aerospace, astrophysics, bioinformatics, chemical physics, medical imaging, and the ATLAS research project on forces that govern the universe.

The cluster uses 30,240 Intel processor 5500 series 2.53 GHz processor cores and is cooled using water.

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*The next Update from the Northern Climate ExChange will be sent out WEDNESDAY JULY 8, 2009.
NOTE: For the months of July and August, the NCE Update will be sent out BI-WEEKLY.*