

# Northern Climate ExChange

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

NCE Update August 3, 2011

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## Announcements

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

*August 4th and 11th*

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!

For more information contact Aletta at the Northern Climate ExChange, 456-8636, [aleitch@yukoncollege.yk.ca](mailto:aleitch@yukoncollege.yk.ca).

### 2. Skills for Employment

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## Articles

### 1. Climate change 'remobilizes' long-buried pollutants as Arctic ice melts

By Lauren Morello  
New York Times  
July 25, 2011

Warming in the Arctic is causing the release of toxic chemicals long trapped in the region's snow, ice, ocean and soil, according to a new study.

Researchers from Canada, China and Norway say their work provides the first evidence that some persistent organic pollutants (POPs) are being "remobilized" into the Arctic atmosphere.

"Our results indicate that a wide range of POPs have been remobilized into the Arctic atmosphere over the past two decades as a result of climate change, confirming that Arctic warming could undermine global efforts to reduce environmental and human exposure to these toxic chemicals," write the scientists, whose analysis was published yesterday in the journal Nature Climate Change.

That's of concern because POPs can travel long distances on air currents, persist in food and water supplies, and accumulate in the body fat of humans and other animals. The pollutants also can be passed from mother to fetus and have been linked to serious health problems in humans and other animals.

Co-author Hayley Hung, a scientist with Environment Canada's Air Quality Division who studies toxic organic pollutants in the Arctic, said that in recent years, researchers had posited that warmer conditions would liberate POPs stored in land, ice and ocean reservoirs back into the atmosphere.

"The chemicals are known to be semi-volatile," Hung said. "They have the ability to evaporate out of storage" -- if temperatures are warm enough.

She and her colleagues began to suspect the phenomenon was already under way when they examined 20 years of air monitoring data collected at a high Arctic monitoring site, Zeppelin Mountain Air Monitoring Station in Norway's Svalbard archipelago.

#### Toxic blasts from the past

Beginning in the mid-2000s, scientists observed higher levels of certain POPs, including hexachlorobenzene and polychlorinated biphenyls (PCBs), at the Norwegian research station. That stood out, Hung said, because the chemicals' use has been restricted to the point where many POPs are no longer produced. As a result, the level of POPs in Arctic air had been decreasing.

"Stockpiles still exist, but these are limited sources," she said, "and the sources are already known to us. So we were surprised to see concentrations actually coming up at the Svalbard station."

The scientists then examined two decades of monitoring data from the Alert monitoring station in the Canadian province of Nunavut. They saw smaller, though still significant, increases in POPs at the second site.

Hung believes the larger increase at the Svalbard site is caused by its proximity to ocean areas where sea ice has retreated. "This is a sign to us that these chemicals are indeed evaporating out of the ocean," she said.

Still, she noted that all POPs don't react the same way to warming. Hexachlorobenzene and PCBs, the chemicals detected in increasing amounts in Norway and Canada, evaporate more easily than many other POPs, and are harder to dissolve in water. That means they're more prone to re-enter the atmosphere after they're deposited on land or sea.

Jordi Dach, a scientist at the Barcelona, Spain-based Institute of Environmental Assessment and Water Research, said the new study provided convincing evidence of the long-suspected movement of POPs from Arctic reservoirs into the atmosphere.

The new study "demonstrates that climate change can remobilize POPs stored in water, snow, ice and presumably soils -- and that this process is already occurring in the Arctic region," he wrote in an essay accompanying the new study.

Eventually, Dachs said, atmospheric circulation patterns could carry the newly liberated POPs to other parts of the globe.

### **Oldies, but not goodies**

"The remobilization of pollutants generated by our grandparents -- pollutants that were banned decades ago -- are unwanted witnesses to our environmental past that now seem to be 'coming in from the cold,'" he said.

Meanwhile, the new study suggests the effect will intensify in the future with continued climate change, based on computer models that attempt to project how rising temperatures would affect the Arctic's chemical reservoirs.

That echoes a report released in February by the U.N. Environment Programme and the Arctic Monitoring and Assessment Programme. "For some POPs, climate change-induced enhancement of emissions may reduce the expected effectiveness of the Stockholm Convention" -- the international treaty that bans use of several POPs -- "resulting in releases decreasing less rapidly than targeted." That's a concern of Hung's, as well.

"The main purpose of this paper is to raise the awareness that climate change actually has an influence on contamination," she said. "It's not as apparent as other, more visible changes. ... People need to be aware there is an effect. As we evaluate the effectiveness of the Stockholm Convention, we need to take into account the effects of climate change."

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

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## **2. 2007 Arctic wildfire released 50 years of stored carbon into atmosphere**

By Doug O'Harra  
Alaska Dispatch  
July 28, 2011

A massive, unprecedented fire that swept across more than 400 square miles of Alaska's North Slope in 2007 spewed more carbon into the air in a few months than the entire Arctic tundra ecosystem normally absorbs in an average year.

Some of the carbon released from the soil last existed in a living plant more than 50 years ago. The Anaktuvuk River fire, the largest ever seen in the world's tundra, dumped an estimated 2.1 teragrams -- or about 2.3 million U.S. tons -- of carbon into the atmosphere over just a couple of months, according to a new publication this week in the journal Nature.

This single event -- which has exposed extensive permafrost to thawing, creating sinkholes and gullies

known as thermokast -- will almost certainly help hurry the rate of climate warming in the Arctic and has already begun to alter how scientists view the Arctic's carbon budget.

"Fire has been largely absent from tundra for the past 11,000 or so years, but the frequency of tundra fires is increasing, probably as a response to climate warming," explained study co-author Syndonia "Donie" Bret-Harete, an ecosystem ecologist at the University of Alaska Fairbanks Institute of Arctic Biology.

"If the frequency of these fires remains at long intervals, 80 to 150 years, then the tundra has time to recover. If these fires occur more frequently, say every 10 years or so, then the landscape cannot recover."

Such an enormous short-term dump of greenhouse gas shows that wildfires have the potential to abruptly cancel out any theoretical upside from climate warming in the Arctic, the scientists say.

"The amount of carbon released into the atmosphere from this fire is equivalent to the amount of carbon stored by the global tundra biome," said lead author Michelle Mack, a biologist from the University of Florida in Gilbert's story. "This was a boreal forest-sized fire."

It amounts to a stunning reality check on climate change dynamics -- and a wake-up call to anyone hoping that the rise in greenhouse gas concentrations might someday get stalled by the flourishing of carbon-hungry Arctic plant growth.

The thinking goes that as higher temperatures and more rain allow more shrubs and trees to spread into the north, and growing seasons lengthen, the "greening" of the Arctic might have the potential to slowly remove an ever larger share of greenhouse gases like carbon dioxide from the air and help stabilize the home planet's climate by acting as a sort of carbon "sink."

Thus, a greening Arctic and faster-growing boreal forest might store enough carbon to begin to offset emissions from human vehicles, ships, power plants and factories.

But this new study from Nature shows that a single hot sunny summer that dries out Alaska's tundra -- perhaps baking it into flammable tinder ready to ignite with a single lightning strike -- can shift the dynamics of the carbon cycle as fast as flames licking through an expanse of parched and crumbling moss.

"Our results show how rapidly a single tundra fire -- even one that burned relatively superficially -- can offset local and biome-scale (carbon) uptake," the authors wrote. "At both local and regional scales, fire emissions of this magnitude can instantaneously offset or reverse (carbon) cycling processes hypothesized to feedback negatively to warming such as greening of the Arctic."

### **Biggest tundra fire on record derails the carbon budget**

The natural presence of certain gases like carbon dioxide in the air helps keep the Earth warm enough for life to exist. Solar radiation warms the planet, and these gases slow the loss of that heat back into space. They act somewhat like glass in a greenhouse, hence the nickname.

After thousands of years of relative stability, Earth's carbon dioxide concentration has been rising over the past century, in sync with the burning of fossil fuel by industrialization and the emissions of modern life. The Earth's CO<sub>2</sub> level is now more than 393 parts per million, according to the latest measurements posted by the Mauna Loa Observatory in Hawaii.

Scientists say such concentrations will accelerate overall warming of the atmosphere and eventually bake the planet to average temperatures not seen in millions of years -- leading to climate change on a scale not seen during the rise of human civilization. Predictions for the coming century include dramatic rises in sea level as ice fields and glaciers melt, big shifts in temperatures that could alter growing seasons and displace agriculture, thawing of permafrost, loss of summer sea ice in the Arctic, plus a slew of more extreme weather events like Category 5 hurricanes, heat waves, droughts, floods and cold snaps.

This human-triggered increase in CO<sub>2</sub> concentrations has also prompted scientists to take closer looks at the Earth's natural carbon cycle, and some surprising details have emerged about the role played by Far North ecosystems in the suck and spew of greenhouse gases.

Generally, summer growth and green-up absorb carbon and sometimes store it in peat, dirt and permafrost.

Natural decay and wildfires release it back to the air.

A study published last month reported that the world's forests play a much larger role in this carbon two-step than anyone realized, especially tropical rain forests in South America, Africa and Southeast Asia. The great boreal forests that encircle the Northern Hemisphere - including the vast spruce-birch woodlands of Alaska - are thought to account for about 22 percent of the total.

"Our results imply that clearly, forests play a critical role in Earth's terrestrial carbon balance, and exert considerable control over the evolution of atmospheric carbon dioxide," said A. David McGuire, co-author and professor of ecology at the UAF's Arctic biology institute.

But Alaska's share in the forest carbon drawdown has been flagging in recent decades --mostly due to increases in wildfire, McGuire told Alaska Dispatch in an email.

Rather than absorb carbon, Alaska's boreal forests lost 6 teragrams of carbon per year during the 1990s, and 14 teragrams of carbon per year in the 2000s.

"The estimated losses occurred primarily because of increased fire activity that occurred in the 1990s and the 2000s in comparison with earlier decades," McGuire said. "Most of the losses occurred from ecosystems in interior Alaska that were impacted by fire (between the Alaska and the Brooks Ranges)."

It's a small amount when compared to the 2,400 teragrams absorbed by the world's forests, with boreal forests sucking up about one fifth of the total.

"Alaska itself seems to be a pretty small player in the total sequestration of carbon by the world's forests," McGuire added. "However, the estimated losses of soil carbon in Alaska due to wildfire and climate might be a harbinger of things that could happen in Canada and Russia."

If climate change triggers more losses -- through wildfires, insect infestation, permafrost thaw -- then the "capability of the world's ecosystems to offset some of the anthropogenic carbon emitted to the atmosphere (from fossil fuel burning and tropical deforestation) will be diminished," he said.

### **Lightning strike and a paradigm shift**

The Anaktuvuk River Fire was ignited by lightning in July 2007. The warmest summer temperatures in at least 19 years, combined with about a quarter of the normal precipitation, helped it spread. Scientists watched a "wall of smoke" from the Toolik Field Station, only 15 miles to the south, Gilbert said.

Such warm, dry conditions were maintained by high pressure over the North Slope that appeared to be related to that summer's record retreat of sea ice, the authors explained in a supplemental discussion of their research.

"Normally we would expect the fire to go out in the moist soil, but this summer was so dry that the fire didn't go out and strong winds in September caused it to burn a very large area," said Bret-Harte.

When snowfall put the fire out in October, the fire had burned across 257,000 acres -- doubling the total acreage burned on Alaska's North Slope over the past 50 years, the authors said.

"This fire was an order of magnitude larger than the average fire size in the historic record for the North Slope ... and remotely sensed indices of severity were substantially higher than for other recorded tundra burns."

The fire soon became the focus of an intensive research investigation by scientists at the Institute of Arctic Biology at the University of Alaska Fairbanks.

"Now, scientists are amassing growing evidence that major events precipitated by warming -- such as fires and the collapse of slopes caused by melting permafrost -- are leading to the loss of tundra in the Arctic," Alaska writer Bill Sherwonit wrote that described some of the impacts of the Anaktuvuk River fire. "The cold, dry, and treeless ecosystem -- characterized by an extremely short growing season; underlying layers of frozen soil, or permafrost; and grasses, sedges, mosses, lichens, and berry plants -- will eventually be replaced by shrub lands and even boreal forest, scientists forecast."

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### 3. Sea level rise less from Greenland, more than Antarctica, during last interglacial

Physorg.com  
July 28, 2011

During the last prolonged warm spell on Earth, the oceans were at least four meters - and possibly as much as 6.5 meters, or about 20 feet - higher than they are now.

Where did all that extra water come from? Mainly from melting ice sheets on Greenland and Antarctica, and many scientists, including University of Wisconsin-Madison geoscience assistant professor Anders Carlson, have expected that Greenland was the main culprit.

But Carlson's new results, published July 29 in *Science*, are challenging that assertion, revealing surprising patterns of melting during the last interglacial period that suggest that Greenland's ice may be more stable - and Antarctica's less stable - than many thought.

"The Greenland Ice Sheet is melting faster and faster," says Carlson, who is also a member of the Center for Climatic Research in the Nelson Institute for Environmental Studies. But despite clear observations of that fact, estimates of just how much the ice will melt and contribute to sea level rise by the end of this century are highly varied, ranging from a few centimeters to meters. "There's a clear need to understand how it has behaved in the past, and how it has responded to warmer-than-present summers in the past."

The ice-estimation business is rife with unknown variables and has few known physical constraints, Carlson explains, making ice sheet behavior - where they melt, how much, how quickly - the largest source of uncertainty in predicting sea level rises due to climate change.

His research team sought a way to constrain where ice remained on Greenland during the last interglacial period, around 125,000 years ago, to better define past ice sheet behavior and improve future projections.

The researchers analyzed silt from an ocean-floor core taken from a region off the southern tip of Greenland that receives sediments carried by meltwater streams off the ice sheet. They used different patterns of radiogenic isotopes to identify sources of the sediment, tracing the silt back to one of three "terranes" or regions, each with a distinct geochemical signature. The patterns of sedimentation show which terranes were still glaciated at that time.

"If the land deglaciates, you lose that sediment," Carlson explains. But to their surprise, they found that all the terranes were still supplying sediment throughout the last interglacial period and thus still had some ice cover.

"The ice definitely retreated to smaller than present extent and definitely raised sea level to higher than present" and continued to melt throughout the warm period, he adds, but the sediment analysis indicates that "the ice sheet seems to be more stable than some of the greater retreat values that people have presented."

The team used their results to evaluate several existing models of Greenland ice sheet melting during the last interglacial period. The models consistent with the new findings indicate that melting Greenland ice was responsible for a sea level rise of 1.6 to 2.2 meters - at most, roughly half of the minimum four-meter total increase.

Even after accounting for other Arctic ice and the thermal expansion of warmer water, most of the difference must have come from a melting Antarctic ice sheet, Carlson says.

"The implication of our results is that West Antarctica likely was much smaller than it is today," and responsible for much more of the sea level rise than many scientists have thought, he says. "If West Antarctica collapsed, that means it's more unstable than we expected, which is quite scary."

Ultimately, Carlson says he hopes this line of research will improve the representation of ice sheet responses to a warming planet in future Intergovernmental Panel on Climate Change (IPCC) reports. Temperatures during the last interglacial period were similar to those expected by the end of this century, and present-day temps have already reached a point that Greenland's glaciers are melting.

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#### **4. Urban sprawl has hurt biodiversity, Ottawa warned**

By Mike De Souza  
Vancouver Sun  
July 21, 2011

Biodiversity is deteriorating at an "unprecedented rate" due to urban and industrial development that's putting Canada's economic and ecological health in jeopardy, Environment Minister Peter Kent was warned in newly released briefing notes.

The dire advice, submitted to the minister when he took over the environment portfolio in January, said that measures taken by Prime Minister Stephen Harper's Conservative government since 2006 to protect Canada's natural wealth had failed to stop declines in a wide variety of species and ecosystems that provide clean water, clean air and food, among other services.

"Biodiversity is being lost at an unprecedented rate due to drivers, or major threats, which include habitat loss and fragmentation, invasive species, climate change, over-exploitation of resources, and pollution," said the briefing notes, released through an access to information request and labelled under the "secret" classification.

"Although Canada is one of the few countries to still have relatively large, intact ecosystems, urban and industrial development, combined with a changing climate, are putting growing pressure on biodiversity and reducing the many economic, ecological and social benefits that biodiversity provides."

The revelations come as Kent was poised to announce the next phase in a government plan to improve monitoring of environmental impacts from oilsands activity.

Kent is scheduled to make the announcement today to follow up on an earlier decision in March to improve and increase monitoring and testing of water quality at various sites near oilsands facilities.

The next phase is expected to cover air quality and biodiversity issues in the surrounding regions.

The briefing notes explained that preserving biodiversity was "critical" to the long-term health, prosperity and security of Canadians.

Kent was told that more than 13 per cent of Canada's Gross Domestic Product - the market value of the goods and services produced in the economy - depends on healthy ecosystems in terms of forests, agriculture, oceans and tourism.

"Biodiversity contributes to essential ecosystem goods and services, such as the production of food and fibre, carbon sequestration, clean air and water, disease and pest control, pollination of food crops and recreational, esthetic and spiritual benefits," said the briefing notes. "The wise management of genetic resources is increasingly seen as essential to innovation in key economic sectors, such as the agricultural, forestry, and pharmaceutical industries. Healthy and resilient ecosystems are one of our best defences to a changing climate."

It acknowledged that the government made efforts in recent years to expand protected areas and national parks but that it needs to do more to stop significant declines in migratory bird populations, commercially important fish stocks, amphibians, reptiles and freshwater mussels.

"Despite these actions [to expand national parks], Canada's biodiversity continues to show signs of decline,

particularly as a result of ongoing habitat loss and fragmentation," said the briefing notes. "There have also been significant declines in key ecosystems such as prairie grasslands [tall grass prairie has been reduced to one per cent] and wetlands. The dramatic loss of sea ice as a result of climate change is having direct impact on northern species, including seals, polar bears and Arctic cod."

The advice to Kent, consistent with findings of recent research on climate change impacts by the National Round Table on the Environment and the Economy - a government advisory panel - explained that invasive alien species were also having a "major impact on many ecosystems," including the Great Lakes, which had more than 180 alien species in 2007 "with many of them causing significant ecological and economic impacts."

A separate section of the briefing notes said that climate change, population growth and other development around the Great Lakes have "serious ecological, health, social and economic implications" in that region.

Kent has declined requests for interviews.

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## 5. Cambridge Bay keeps an eye on CHARS High tech to flow from Canadian High Arctic Research Station

By Jane George  
Nunatsiaq Online  
July 27, 2011

The development of small submarines to explore Arctic waters and an alternative power system that can keep Arctic communities warm without polluting the environment: these are among the high tech improvements expected to flow from Canada's new high Arctic research station in Cambridge Bay.

The \$81-million Canada High Arctic Research Station, which goes by the nickname CHARS, is set to open in Cambridge Bay in 2017.

Now at the design stage, the facility could be located on one or more of six lots around the Kitikmeot town of 1,200, as a single building or as several built as a kind of campus.

But since Prime Minister Steven Harper announced last August that CHARS would be coming to Cambridge Bay, a science and technology team has moved ahead to set five major priorities for new facility where researchers from Canada and around the world will work on developing new science and technology - such as an Arctic-adapted autonomous submersible vehicle to explore underwater.

At CHARS, they'll also study resource development, monitor changes in the climate and look at human health in the Arctic, with a focus on mental health and food security.

"We like the menu. We can feast on it," quipped Cambridge Bay mayor Syd Glawson about the research priorities for CHARS.

But Glawson wants to make sure his community, which he calls "the centre of my universe," is ready for CHARS.

"We going to make sure we are," Glawson said.

However, Glawson and the hamlet's senior administrative officer, Steve King, say they can't count on any money from the Government of Nunavut to prepare. That will have to come from other sources, they said.

While it's just a "guessestimate," Cambridge Bay, whose population is expected to boom soon as the construction of CHARS starts, needs about \$100 million to cover new infrastructure, they said. These needs include road-paving, more fire-fighting equipment, a new municipal garage and an expanded

airport.

"We have no way of raising money ourselves," Glawson said, because the town has no tax base. So, without any outside assistance from government, organizations and industry "we'll be in trouble," he said.

As part of its planning for CHARS, the hamlet also wants to see tank farm, which now lies in the centre of the growing community, to be moved further away from the town's centre towards the airport.

As well, a new dock accommodate the growing number of vessels, small and large, which sail through the Northwest Passage every summer, is on the hamlet's wish-list.

But a state-of-the-art utilidor system lies at the heart of Cambridge Bay's dream for its future as a centre for cutting-edge research and development in the Canadian Arctic.

It's the base of an "integrated infrastructure" proposal that the hamlet is developing. The utilidor would replace the hamlet's present trucked system of water delivery and waste pick-up. Its new piped system would also carry power from alternative energy sources to homes and public buildings.

The utilidor plan includes a facility for gasification, a process that uses high temperatures to convert organic materials and biodegradable waste into what's called "syngas."

Gasification was used to produce gas for lighting and cooking in 1800s, but was later replaced by electricity and natural gas until it re-emerged during the world wars when there was a shortage of petroleum projects.

Gasification, now used mainly in industry, can reduce wastage and provide a local energy source at the same time, and it could free Cambridge Bay from using diesel fuel to run its electrical generators.

While Cambridge Bay pursues its dreams of freeing itself from polluting fossil fuels, a steering committee of local business people continue to look at other ways Cambridge Bay can gear up for CHARS.

The idea is to rally "all the forces that the community can control" and get those ready for 2017, Glawson said - such as building more housing and hotel rooms and opening a bowling alley, restaurant and a movie theatre.

Scientists are already interested in seeing the future home of CHARS for themselves. Last week saw a group of researchers from the Canadian Coast Guard icebreaker Louis St. Laurent tour Cambridge Bay as well as a visit from scientists from South Korea.

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## 6. Bear researcher frozen out

By Eugenie Samuel Reich  
Nature News  
August 2, 2011

It was one of the most dramatic sightings ever made in an aerial survey of the Arctic: a dead polar bear, bloated like a gigantic beach ball, floating in open water north of the Beaufort Sea coastline in Alaska.

Researchers say that they spotted four dead polar bears during the survey, and surmised that the bears drowned in stormy waters as they searched for ever-receding sea ice. The idea that polar bears could drown like this became a rallying point for advocates of action on climate change, most notably appearing in former US vice-president Al Gore's film *An Inconvenient Truth* (2006).

Now, five years after the observations were reported, the bears have become the focus of charges ranging from scientific fraud to political interference in science. Last week, it emerged that the US Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE) had suspended a researcher involved in the survey, wildlife biologist Charles Monnett. The reason, according to an 18 July memo from Monnett's

supervisor, Jeffrey Loman, was an investigation into "integrity issues" by the Office of the Inspector General (OIG) at the US Department of the Interior, which oversees the BOEMRE. Climate-change sceptics were quick to jump on the news as evidence that the science of global warming had been distorted. The BOEMRE has also halted a different polar-bear survey overseen by Monnett, pending further investigation.

Monnett's suspension was brought to light on 28 July by Public Employees for Environmental Responsibility (PEER), a watchdog group in Washington DC that is giving Monnett legal advice in the matter.

PEER released a transcript of an interview between criminal investigators at the OIG and Monnett, in which Monnett was told that he had been accused of scientific misconduct. He was then asked a series of questions relating to the paper in which he had reported the four drowned polar bears (C. Monnett and J. S. Gleason *Polar Biol.* 29, 681-687; 2006), but was not told the specific allegations.

Jeff Ruch, executive director of PEER, says that this does not conform with the Department of the Interior's scientific-integrity policy, which states that those accused of misconduct should be properly informed of the allegations against them, and that the allegations should be referred to a scientific-integrity official, not to criminal investigators. On 29 July, PEER filed a scientific and scholarly misconduct complaint against Monnett's superiors and the OIG, accusing them of violating the policy.

Ruch claims that the suspension is a politically motivated attack on Monnett's research at a time when the BOEMRE is considering whether to allow an expansion of oil drilling off Alaska's northern coast. The bureau denies this, and any accusation of playing into the oil industry's hands is highly sensitive, because the bureau (then known as the Minerals Management Service) was accused of poor oversight of the industry leading up to the Deepwater Horizon oil spill in the Gulf of Mexico in 2010. Ruch adds that Monnett is declining interviews because he has not been granted permission to do them by the bureau.

"Any accusation of playing into the oil-industry's hands is highly sensitive."

After a day of negative publicity generated by PEER's announcement, the bureau hit back. Spokeswoman Melissa Schwartz says that, contrary to the impression given by the transcript, Monnett's suspension was unrelated to scientific-integrity issues, his polar-bear finding or oil-drilling permits. She declined to say what it was related to.

But a 13 July memo to Monnett, provided to Nature by PEER, says that the investigation had uncovered information that raised concerns about his ability to act "in an impartial and objective manner" while handling a US\$1.1-million contract for a study of polar bears in the Canadian Arctic. A notice sent to Monnett by the OIG on 29 July further explained that although investigators may continue to query him on scientific integrity, they will now focus on how Monnett awarded the research contract. This includes questions over whether Monnett complied with the Federal Acquisition Regulation, which is intended to ensure fair competition for US government contracts. The OIG adds that the inquiry is not criminal in nature, as the Department of Justice has already considered the case and declined to prosecute. Ruch says that Monnett's handling of the contract was transparent to his supervisors, and that his technical role meant he was not responsible for compliance with the regulation.

The project, begun in 2005, involves putting radio collars on polar bears found on the Canadian side of the Beaufort Sea, and tracking their position by satellite over several seasons. The study is funded by various sources, including the BOEMRE and the Canadian government. But on 13 July, the BOEMRE told scientists on the project to stop their work. The project's principal investigator, Andrew Derocher, a biologist at the University of Alberta in Edmonton, Canada, says he had no idea why. "To begin with, I thought it was related to budgetary issues in the United States. I've never seen anything like this in my life," he says.

Derocher says that data should continue to come in from collars until 2013, but the 'stop work' order may mean that he is unable to document his findings in a final report to the agency. Among those findings is that 2-4-year old polar bears tend not to stray far from their home range - the first time this age group has been tracked. This would mean that in the event of a large oil spill, bears that died from oil exposure would not be replaced quickly by bears from surrounding areas, says Derocher.

Drowned polar bears have not been reported by other scientists, but the hypothesis that a long search for sea ice makes it more likely that bears will get caught in stormy weather and drown is regarded as plausible. In January, scientists led by George Durner at the US Geological Survey in Anchorage, Alaska, reported the fate of an adult female bear as she swam more than 600 kilometres before reaching ice (G. M. Durner et al. *Polar Biol.* 34, 975-984; 2011). When the researchers caught up with the animal, she

had lost 22% of her body mass and her year-old cub.

This finding, corroborated by other studies, suggests that the major impact of receding sea ice on the bears is nutritional stress caused by a reduction of their hunting range, says Steven Amstrup, chief scientist at the campaigning organization Polar Bears International, headquartered in Bozeman, Montana, and a co-author of the study. But the observation that drowning can occur is important, he adds. "If this investigation is not about those observations then the BOEMRE owes it to him and to the public to say clearly what it is about."

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