



Northern Climate ExChange

Independent Information - Shared Understanding - Action on Climate Change

NCE Update September 16, 2009



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Announcements

1. Fire on the Mountain: A close look at Yukon's forest fire regime and how it might be changing - Yukon Science Institute (YSI) Public Lecture Series 2009-2010.

David Milne, Planning and Science Supervisor, Yukon Wildland Fire Management. Sunday, **September 20, 2009**, 7:30 pm at the Yukon Beringia Interpretive Centre in Whitehorse.

Lightning each summer is inevitably accompanied by wildland fires: living in the Yukon means living with fire. Forests here have evolved to depend upon fire as a life source for change and renewal. The variability in fire occurrence and its effect on the forest is very difficult to predict. Fires proliferate on the landscape one year as large conflagrations and are almost nonexistent the next. What drives this variability? Why are the changeable fire patterns on our forest landscapes important?

Climate change is a variable that is predicted to have a dramatic effect on the health and species composition of our forests over the coming generations. Current research also indicates that the fire season will be changing. Will it be more fire more of the time? Will communities become more difficult to protect?

www.taiga.net

2. PCIC Seminar Presentations - September 21, 2009

Marco Braun UQAM/Ouranos: "Validation of Hydro-Meteorological Variables"



and their Projected Changes for North American Basins in an Ensemble of Canadian Regional Climate Model Simulations" - [Abstract](#)

Daniel Caya, UQAM/Ouranos: "Estimation of Future Hydrological Regime and its Associated Uncertainty Over the Mackenzie River Basin-Preliminary Analysis" - [Abstract](#)

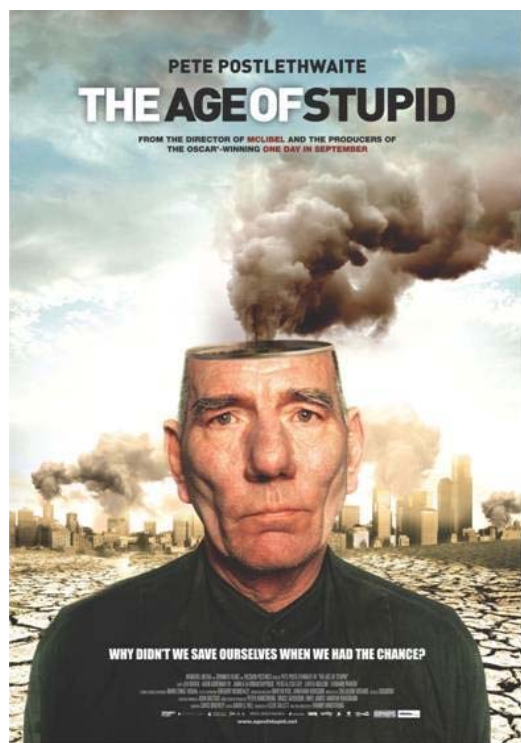
WHEN: September 21, 2009
TIME: 11:00 a.m.
PLACE: Sedgewick Boardroom, Rm C168 Sedgewick, University of Victoria

www.pacificclimate.org

3. Film Screening: "The Age of Stupid"

The **Northern Climate ExChange**, Yukon College, is pleased to invite you to a screening of the new feature-length cinema-documentary:

"The Age of Stupid" www.ageofstupid.net



Wednesday October 14, 2009

The Old Firehall, Whitehorse, YT

Doors open at 6:30 p.m.

Show starts at 7 p.m.

(Seating is limited, so please arrive early).

'The Age of Stupid' is the new cinema documentary from the Director of 'McLibel' and the Producer of the Oscar-winning 'One Day In September'. This enormously ambitious drama-documentary-animation hybrid stars Oscar-nominated Pete Postlethwaite as an old man living in the devastated world of 2055, watching "archive" footage from 2008 and asking: why didn't we stop climate change while we had the chance?

www.taiga.net/nce/

4. GLOBAL DAY OF ACTION - International Demonstrations on Climate Change, December 12th 2009.

The **Global Day of Action** on climate has occurred every year since 2005 at the time of the annual United Nations Talks on climate change (the COP or "Conference of Parties" to the United Nations Framework Convention on Climate Change or UNFCCC). People from all around the world have come together on the same day to demand urgent action on climate, and climate justice, from the governments of the world meeting at the annual climate talks. The Global Day of Action 2009 will take place **December 12**, during the United Nations Talks on climate change (COP15/MOP5) in Copenhagen, Denmark.

<http://www.globalclimatecampaign.org/>

5. Published: Ecological Dynamics Across the Arctic Associated with Recent Climate Change. Science. 2009 Sep 11;325(5946):1355-8.

Post E, Forchhammer MC, Bret-Harte MS, Callaghan TV, Christensen TR, Elberling B, Fox AD, Gilg O, Hik DS, Høye TT, Ims RA, Jeppesen E, Klein DR, Madsen J, McGuire AD, Rysgaard S, Schindler DE, Stirling I, Tamstorf MP, Tyler NJ, van der Wal R, Welker J, Wookey PA, Schmidt NM, Aastrup P.

Department of Biology, Penn State University, 208 Mueller Lab,
University Park, PA 16802, USA. esp10@psu.edu

At the close of the Fourth International Polar Year, we take stock of the ecological consequences of recent climate change in the Arctic, focusing on effects at population, community, and ecosystem scales. Despite the buffering effect of landscape heterogeneity, Arctic ecosystems and the trophic relationships that structure them have been severely perturbed. These rapid changes may be a bellwether of changes to come at lower latitudes and have the potential to affect ecosystem services related to natural resources, food production, climate regulation, and cultural integrity. We highlight areas of ecological research that deserve priority as the Arctic continues to warm.

www.sciencemag.org

Articles

1. Research finds dramatic biological responses to Arctic warming

Pennsylvania State University
September 10, 2009

"The Arctic as we know it may soon be a thing of the past," according to Eric Post, associate professor of biology at Penn State. Post leads a large, international team that carried out ecosystem-wide studies of the biological response to Arctic warming during the fourth International Polar Year, which ended in 2008. The team's results will be reported on Sept. 11 in the journal Science.

The team's research documents a wide range of responses by plants, birds, animals, insects, and humans to the warming trend. The scientists found that the increase in mean annual surface temperature in the

Arctic over the last 150 years has had dramatic effects. In the last 20 to 30 years, for example, the seasonal minimal sea ice coverage has declined by a staggering 45,000 square kilometers per year. Similarly, the extent of terrestrial snow cover has declined steadily, with earlier melting and breaking up and an earlier start to the growing season.

"Species on land and at sea are suffering adverse consequences of human behavior at latitudes thousands of miles away," Post said. "It seems no matter where you look -- on the ground, in the air or in the water -- we're seeing signs of rapid change."

High-resolution images related to this story are on the Web at <http://www.science.psu.edu/alert/Post9-2009.htm> online.

The study, led by Post, shows that many iconic Arctic species that are dependent upon the stability and persistence of sea ice are faring especially badly. Loss of polar ice habitat is causing a rapid decline in the numbers of ivory gull, Pacific walrus, ringed seal, hooded seal, narwhal, and polar bear. The researchers found that Polar bears and ringed seals, both of which give birth in lairs or caves under the snow, lose many newborn pups when the lairs collapse in unusually early spring rains. These species may be headed for extinction.

The research also reveals that species once confined to more southerly ranges now are moving northward. Among the most visible invaders are red foxes, which are displacing Arctic foxes from territories once too cold for red foxes. Some of the less showy invaders that the scientists found also are moving northward include the winter moth, which defoliates mountain birch forests, and species of Low Arctic trees and shrubs, which affect the dynamics of trace-gas exchange. The presence of more shrubs and trees promotes deeper snow accumulation, increasing soil temperatures during the winter, and more microbial activity in the soil, which in turn makes the habitats more suitable for shrubs. Increasing the shrub cover may lengthen the period during the growing season when the tundra acts as a carbon-dioxide sink. Countering this change, the research reveals, are musk oxen and reindeer, which browse on shrubs, limiting their carbon-soaking capacity and northward expansion to the High Arctic. Grazing, trampling, and defecation by these herbivores promote the growth and spread of grasses, which further attract geese. The geese in turn influence the productivity of lakes, where they rest and graze. The research indicates that complex aquatic and marine food webs like these are extremely vulnerable to alteration due to changes in temperature, precipitation and nutrient load from the land.

The paper by Post's research team shows that the effects of Arctic warming have been dramatic so far, especially since the warming amounts to only about 1-degree Celsius over the last 150 years. Post said it is difficult to predict what will happen with the anticipated 6-degree warming over the next century.

"The results of our studies so far reveal widespread changes, but also a surprising heterogeneity in biological responses to warming," Post said.

For example, the study shows that wild reindeer on the Norwegian archipelago of Svalbard actually have benefited from melting of snow during winter, and perhaps also from the earlier seasonal loss of snow cover. With less snow cover and a longer growing season, these nonmigratory reindeer have taken advantage of the increased plant abundance, with the result that reindeer populations and their ability to reproduce are up, while mortality is down.

In contrast, migratory caribou in Low Arctic Greenland and elsewhere are declining in numbers, the study found. The caribou have not been able to adjust their calving season to keep it synchronized with changes in plant growth. Thus, the research shows, the time when the females need the most food no longer matches the time of maximum food availability, so fewer calves survive. The research suggests that hotter summers may result in more insects and parasites to prey on the caribou, which in turn may reduce the annual caribou harvest by local indigenous peoples.

"Inuit hunters at my study site in Greenland have all but given up on hunting caribou there. What will be the next component to disappear from their traditional lifestyle, a lifestyle that has worked for thousands of years?" Post said.

Many questions remain unanswered as scientists wrestle with forecasting future events and developing plans to conserve the fragile Arctic ecosystems. Because there are relatively few species in the Arctic, ecosystems in this region may be more vulnerable to changes in its climate. "There is little functional

redundancy among species in Arctic ecosystems," said Post. "Therefore, relatively small shifts in species ranges or abundances may cause fundamental changes in a unique ecosystem that also is important for tourism and traditional cultures."

Why do some parts of the ecosystem appear to be unaffected by rising temperatures, while others seem to be heading for collapse? For example, despite heavy harvest and changing environmental conditions, sockeye salmon production in Bristol Bay, Ala., has remained relatively stable or even increased over the last century. Though hundreds of salmon populations are scattered throughout a range of habitats, the system somehow has compensated for these serious demands.

It has long been assumed that the most important biological activities in the Arctic occur during the growing season, but the work highlighted by Post's team suggests otherwise. One natural winter warming episode in the sub-Arctic led to vegetation damage so extensive that plant productivity in the following summer was reduced by 26 percent over an area of at least 1,400 square kilometers. In a different area, there was an unexpectedly large release of methane into the atmosphere at the onset of autumn soil freezing. Though working in the Arctic in the autumn and winter poses logistical problems, the findings indicate the importance of monitoring the dynamics of the ecosystem year-round.

"People have thought of the Arctic as a relatively simple ecosystem that is easily understood, but in fact it is very complex," Post said. "Not all populations within a given species respond similarly to warming because physical and landscape features that interact with climate can vary tremendously from site to site. I think response heterogeneity is going to be one of the keys to species persistence, community integrity and ecosystem function as the Arctic continues to warm."

Post's team calls for the establishment of a pan-Arctic series of integrated baseline studies to monitor the physical drivers of climate change and the biological responses to them over the long term.

"We've seen a great deal of emphasis recently on the melting of Arctic ice," Post said. "The broad, rapid and in some cases devastating changes documented in this paper remind us of why it's important to give consideration to the consequences of rising temperatures."

In addition to Post, the team he led was comprised of biologists, ecologists, geographers, botanists, anthropologists, and fish and wildlife experts from the University of Alberta and the Canadian Wildlife Service in Canada; Aarhus University and the University of Copenhagen in Denmark; the University of Helsinki in Finland; the Arctic Ecology Research Group in France; the Greenland Institute of Natural Resources in Greenland; the University Centre on Svalbard, the University of Tromsø, and the Centre for Saami Studies in Norway; the University of Aberdeen and the University of Stirling in Scotland; Lund University and the Abisko Scientific Research Station in Sweden; the University of Sheffield in the UK; and the Institute of Arctic Biology and the U.S. Geological Service at the University of Alaska-Fairbanks, the Environment and Natural Resources Institute of the University of Alaska-Anchorage, and the University of Washington in the United States. Support was provided by Aarhus University, the Danish Polar Center, and the U.S. National Science Foundation.

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2. Climate change means northern high latitudes will receive less ultraviolet radiation, says U of T researcher

By Sean Bettam
University of Toronto
September 14, 2009

Physicists at the University of Toronto have discovered that changes in the Earth's ozone layer due to climate change will reduce the amount of ultraviolet (UV) radiation in northern high latitude regions such as Siberia, Scandinavia and northern Canada. Other regions of the Earth, such as the tropics and Antarctica, will instead face increasing levels of UV radiation.

"Climate change is an established fact, but scientists are only just beginning to understand its regional

manifestations," says Michaela Hegglin, a postdoctoral fellow in the Department of Physics and the lead author of the study published this month in *Nature Geoscience*.

Using a sophisticated computer model, Hegglin and U of T physicist Theodore Shepherd determined that 21st-century climate change will alter atmospheric circulation, increasing the flux of ozone from the upper to the lower atmosphere and shifting the distribution of ozone within the upper atmosphere. The result will be a change in the amount of UV radiation reaching the Earth's surface which varies dramatically between regions: e.g., up to a 20 per cent increase in UV radiation over southern high latitudes during spring and summer and a nine per cent decrease in UV radiation over northern high latitudes by the end of the century.

While the effects of increased UV have been widely studied because of the problem of ozone depletion, decreased UV could have adverse effects too, e.g., on vitamin D production for people in regions with limited sunlight such as the northern high latitudes.

"Both human and ecosystem health are affected by air quality and by UV radiation," said Shepherd. "While there has been much research on the impact of climate change on air quality, our work shows that this research needs to include the effect of changes in stratospheric ozone. And while there has been much research on the impact of ozone depletion on UV radiation and its impacts on human and ecosystem health, the notion that climate change could also affect UV radiation has not previously been considered. This adds to the list of potential impacts of climate change, and is especially important for Canada as northern high latitudes are particularly affected."

The research was funded by the Canadian Foundation for Climate and Atmospheric Sciences through the C-SPARC project. The C-SPARC project is a national collaboration between Environment Canada and several Canadian universities.

www.news.utoronto.ca

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3. Walrus congregate on Alaska's shore as sea ice melts

By Dan Joling
Associated Press
Fairbanks Daily News-Miner
September 9, 2009

ANCHORAGE, Alaska - Thousands of walrus are congregating on Alaska's northwest coast, a sign that their Arctic sea ice environment has been altered by climate change.

Chad Jay, a U.S. Geological Survey walrus researcher, said Wednesday that about 3,500 walrus were near Icy Cape on the Chukchi Sea, some 140 miles southwest of Barrow.

Animals the agency tagged with satellite transmitters also were detected on shore at Cape Lisburne about 150 miles farther down the coast.

Walrus for years came ashore intermittently during their fall southward migration but not so early and not in such numbers.

"This is actually all new," Jay said. "They did this in 2007, and it's a result of the sea ice retreating off the continental shelf."

Federal managers and researchers say walrus hauling out on shore could lead to deadly stampedes and too much pressure on prey within swimming range. Projections of continued sea ice loss means the phenomenon likely is not going away.

"It's more of the same," Jay said. "What we've been seeing over the past few years with reduced sea ice conditions, we might be seeing this more and more often, and it's probably not good for the walrus," he said.

Unlike many seals, walrus cannot swim indefinitely and must rest periodically between feeding forays. They rely on sea ice as a platform for foraging for clams in the shallow waters of the outer continental shelf. They can dive up to 630 feet for clams and other sea floor creatures but mostly feed in waters of less than 330 feet, Jay said. Beyond the continental shelf, water can reach depths of 10,000 feet or more.

An estimated 6,000 or more walrus congregated on Alaska's shore in the fall of 2007, taking scientists by surprise.

Herds were in the tens of thousands at some locations on the Russian side of the Chukchi Sea, with an estimated 40,000 animals at Point Shmidt. Russian biologists reported 3,000 to 4,000 walrus out of population of perhaps 200,000 died, mostly young animals crushed in stampedes.

Alaska herds did not experience that sort of mortality but scientists acknowledge a concern when the marine mammals are concentrated on a rocky shore rather than hundreds of miles of sea ice edge.

"They may have a much higher predation pressure on those nearshore areas when they're using those land haulouts than when they're using sea ice," Jay said.

The Center for Biological Diversity has petitioned to list the Pacific walrus as an endangered or threatened because of habitat loss due to warming. The U.S. Fish and Wildlife Service on Tuesday agreed to begin a detailed status review. A 60-day public comment period will precede an agency listing decision by October 2010. A final decision would be made by the Interior secretary by October 2011.

The agency is working with the Federal Aviation Administration to warn away pilots, who can cause stampedes, said walrus researcher Joel Garlich-Miller. So can polar bears or human hunters. There is no legal mechanism to keep hunters away, he said, but people have been letting the animals rest.

USGS researchers plan to head to the Chukchi coast next week to place satellite tags on up to 30 animals so their foraging habits can be studied, Jay said.

The 2007 herds prompted researchers to gear up for studies of the animals' new habits last year. However, remnant ice floating apart from the main pack ice kept walrus off shore, Jay said. Their reappearance put the research plans into motion.

"We're trying to get more information on how the walrus are responding to the loss of sea ice over the continental shelf, where do they go when they do come to shore like this, how far offshore are they foraging," he said.

On land, walrus have to swim out and return rather than diving vertically. That could lead to nutritional stress.

"We suspect that it's going to cost them more energy to do that than if they were able to stay on the sea ice," he said.

Jay has not heard reports of walrus congregating on Russian shores. One animal tagged on the U.S. side has hauled out there and herds likely are gathering, he said.

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4. Shoreline erosion: a threat to lake ecosystems?

By Andrew Rankin
Northern News Services
September 10, 2009

INUVIK - Permafrost slumping is a dramatic form of shoreline erosion. While this occurs around many lakes near Inuvik, a visiting University of Victoria researcher is attempting to figure out the specific effect the

process is having on the ecosystem of one lake just east of Inuvik.

Since last April hydrologist Erika Hille's research has been focusing on two lakes located near Noell Lake, one of which is the victim of permafrost slumps, the other is not.

"I'm trying to understand how permafrost degradation will impact Arctic freshwater ecosystems," she said. "You have a fresh water ecosystem which is extremely sensitive to climate change. You have climate warming and increased permafrost degradation due to climate change. I'm looking at how that's going to impact the hydrology of the lake."

Her research often involves long days in the field where she collects a range of tests and samples, including snow surveys to determine how much water will enter the lake due to snow melt, monitoring the water flowing into and out of the lake during snow melt, measuring the geochemicals going into the lake, the carbon inputs and the chemistry of the water and then figuring out what can be attributed to permafrost degradation.

"(The slumping) could have effects on the lake ecosystem," she said. "It's hard to say because we don't have any definitive answers yet."

The other lake, unaffected by slumping, will be used as a comparison model.

Hille's project, which is largely funded by Environment Canada, is part of her master's degree thesis. It's also part of a larger five-year study that includes a team of researchers looking at 66 lakes that run parallel to a section of the proposed Mackenzie pipeline route, stretching from Noell Lake north to Richards Islands, just west of Tuktoyaktuk.

Her portion of the project is expected to be completed in two years. She's currently working with a post-graduate student while under the supervision of two professors at the University of Victoria.

She'll start crunching the numbers and analyzing her data when she returns to Victoria next month.

She said there's no guarantees that the hydrology - the water's quality and movement - and the ecosystems of the studied lakes will be significantly affected by slumping. But she added the study is warranted given the serious effect permafrost melting is having on the overall Arctic environment.

"Permafrost is a big part of what's going to be changing in the Arctic in the upcoming years. It's changing rapidly and I think by assessing how that change is going to impact ecosystems is of the utmost importance."

Her research can be extremely demanding requiring her to travel to the site at a moment's notice and enduring harsh weather conditions, but she remains committed to the cause and sees her work as a piece of a larger puzzle.

"Arctic ecosystems are so dynamic, they're such sensitive systems because everything here is adapted to the cold," she said.

"Now that everything is warming, those ecosystems are going to have to adapt rapidly and that means everything changes so quickly. You have the ability to look at systems that are changing very quickly and maybe in the future you can apply what you've learned from these systems to other systems that are changing more slowly further south, which are not as sensitive as these Arctic systems."

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5. North still needs scientists, says David Hik

By Brian Murphy
University of Alberta
September 11, 2009

Arctic and Antarctic research teams pulled back to warmer climates when the International Polar Year wrapped last March. But the call has gone out for a return to the poles for a sustained investigation into the accelerating effects of global warming. David Hik, a University of Alberta biology professor and a lead researcher with IPY, is one of the researchers pushing for a return to the Canadian Arctic.

"IPY gave us a great snapshot of the state of the planet's polar regions," said Hik. "But in the Arctic, we made many observations that need a more thorough look, especially in the very early spring and the dead of winter."

Hik says university calendars dictate when most northern research can be done. The only time professors and graduate students have for distant fieldwork is spring and summer.

"We have to be there as the snow begins to melt and we have to be there in the dark of winter to witness and document the effects of reduced snow cover," he said.

Hik says having researchers' boots on the Arctic tundra throughout the year will focus more intense research into a number of climate-change issues brought to light during IPY.

For example, the early onset of spring complicates the timing for calving caribou and their access to tundra vegetation when it's at its prime. "Warmer temperatures and an earlier growing season mean the best, nitrogen-rich grassland may come and go before calving caribou cows can get to it," said Hik. "The cows need that high-quality vegetation to produce milk."

Another issue is the reduction of snow cover and the loss of its insulation for hibernating animals across the Arctic. Hik takes particular interest in the plight of the hoary marmot's winter sleep.

"The marmot stores up enough energy to raise its body temperature from as low as three degrees Celsius to 38 C for brief periods during hibernation," he said. But less snow cover insulation requires the marmot to heat itself up more often to combat the cold. "We think that more animals may die during hibernation because they just can't store enough energy to bring their body temperatures up."

Hik is hoping the increased work of all-season Arctic monitoring can be shared with the people who live there. Entire northern communities have built up relationships with climate change researchers as they crisscrossed the Arctic during IPY, he says.

"People living in the North can keep an eye on the berry bushes, which are a food staple for many species," said Hik. He also notes that it was northerners who alerted biologists to another sign of climate change: the robin, among the most common of birds in the urbanized south, has become a more frequent visitor to the Arctic Islands.

As a follow up to IPY, Hik co-authored a paper summarizing some of the research findings of the massive project. It was published this week in Science.

Hik is also helping organize a wrap-up conference for all of IPY's Arctic and Antarctic research teams next June in Norway.

"It's important that we synthesize all the work of thousands of scientists," he said. "We can show the planet's current climate-change trajectory and pull together the resources needed to address the most pressing concerns."

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6. Climate Effects of Atmospheric Haze a Little Less... Hazy

NOAA
September 9, 2009

Scientists have used a new approach to sharpen the understanding of one of the most uncertain of

mankind's influences on climate-the effects of atmospheric "haze," the tiny airborne particles from pollution, biomass burning, and other sources.

The new observations-based study led by NOAA confirms that the particles ("aerosols") have the net effect of cooling the planet-in agreement with previous understanding-but arrives at the answer in a completely new way that is more straightforward, and has narrowed the uncertainties of the estimate. The findings appear in this week's Journal of Geophysical Research - Atmospheres.

The researchers, led by NOAA scientist Daniel M. Murphy of NOAA's Earth System Research Laboratory in Boulder, Colo., applied fundamental conservation of energy principles to construct a global energy "budget" of the climate's "credits" and "debits"-heating and cooling processes-since 1950, using only observations and straightforward calculations without the more complicated algorithms of global climate models. They then calculated the cooling effect of the aerosols as the only missing term in the budget, arriving at an estimate of 1.1 watts per square meter. A watt is a unit of power.

The results support the 2007 assessment by the Intergovernmental Panel on Climate Change (IPCC) that estimated aerosol cooling at 1.2 watts per square meter. But the new study places that estimate on more solid ground and rules out the larger cooling effects that were previously thought to be possible.

"The agreement boosts our confidence in both the models and the new approach," said Murphy. "Plus, we've been able to pin down the amount of cooling by aerosols better than ever."

The narrower bounds on aerosol effects will help in predicting climate change and accounting for climate change to date.

In balancing the budget for the processes perturbing the heating and cooling of the Earth, Murphy and colleagues found that since 1950, the planet released about 20 percent of the warming influence of heat-trapping greenhouse gases to outer space as infrared energy. Volcanic emissions lingering in the stratosphere offset about 20 percent of the heating by bouncing solar radiation back to space before it reached the surface. Cooling from the lower-atmosphere aerosols produced by humans balanced 50 percent of the heating. Only the remaining 10 percent of greenhouse-gas warming actually went into heating the Earth, and almost all of it went into the ocean.

The new study tackled what the IPCC has identified as one of the most uncertain aspects of the human impacts on climate. Aerosols, which can be either solid or liquid, have complex effects on climate. Sulfate particles formed from pollution can cool the Earth directly by reflecting sunlight. Soot from biomass burning absorbs sunlight and warms the Earth. Aerosols can also affect the formation and properties of clouds, altering their influence on climate. The net effect of all these direct and indirect factors is a cooling by aerosols, which has partially offset the warming by greenhouse gases.

Authors of the study are Daniel M. Murphy, Susan Solomon, Robert W. Portmann, and Karen H. Rosenlof of NOAA's Earth System Research Laboratory; Piers M. Forster of the University Leeds, UK; and Takmeng Wong of the NASA Langley Research Center.

NOAA understands and predicts changes in the Earth's environment, from the depths of the ocean to the surface of the sun, and conserves and manages our coastal and marine resources.

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7. 2 German cargo ships pass through northeast 'Arctic Passage'

By Matt Moore and Seth Borenstein
Associated Press
Fairbanks Daily News-Miner
September 11, 2009

FRANKFURT - Two German merchant ships have traversed the fabled Northeast Passage after global warming and melting ice opened a route from South Korea along Russia's Arctic coast to Siberia.

Now the German-owned ships are poised to complete their journey through the cold waters where icebergs abound, heading for Rotterdam in the Netherlands with 3,500 tons of construction parts.

The merchant ships MV Beluga Fraternity and MV Beluga Foresight arrived this week in Yamburg, Siberia, their owner Beluga Shipping GmbH said Friday. They traveled from Ulsan, South Korea, in late July to Siberia by way of the Northeast Passage, a sea lane that, in years past, was avoided because of its heavy ice floes.

Scientists report that the Arctic Ocean ice cap has been shrinking to unprecedented levels in recent summers, because of global warming, opening up many passages that were ice-choked in earlier times.

In July, new NASA satellite measurements showed that sea ice in the Arctic was not just shrinking in area, but thinning dramatically.

Niels Stolberg, the president of Beluga, which is based in the German city of Bremen, called it the first time a Western shipping company successfully transited the Northeast Passage.

"To transit the Northeast Passage so well and professionally without incident on the premiere is the result of our extremely accurate preparation as well as the outstanding team work between our attentive captains, our reliable meteorologists and our engaged crew," Stolberg said.

He said the shipping company was planning more voyages through the area in coming months. Traditionally, shippers traveling from Asia to Europe have to go through the Gulf of Aden and through the Suez Canal into the Mediterranean Sea and, pending their destination, into the Atlantic Ocean.

A journey from South Korea to the Netherlands, for example, is about 11,000 nautical miles (12,658 miles). By going northward and using the Northeast Passage, approximately 3,000 nautical miles (3,452 miles) and 10 days can be shaved off. That means lower fuel costs.

Researchers said the ability to navigate the route showed climate change.

"We are seeing an expression of climate change here," said Mark Serreze, director of the National Snow and Ice Data Center in Boulder, Colo. "The Arctic is warming; we're losing the sea ice cover. The more frequent opening of that Northeast Passage is part of the process we're seeing."

"The Arctic is becoming a blue ocean," Serreze told The Associated Press.

For the last few years, including this year, navigator Roald Amundsen's famous Northwest Passage has been navigable. Then in 2007, the more crucial deep water channel called McClure Strait opened up and now the Northeast Passage, Serreze said. The passage "is the traditional choke point," Serreze said.

That northern route "is going to become more and more open on a seasonal basis," Serreze said. But it won't be consistently open because of local weather patterns that could still freeze it up for long time periods.

This year is shaping up to have the third lowest amount of Arctic sea ice on record, just behind the worst year set in 2007 and in 2008. But just because 2009 is slightly up from the past two years, it is not an upward trend or a recovery, Serreze said. It reflects a change in local weather patterns that occurred in August, he said.

"It's certainly part of the overall decline of sea ice that we've been seeing," Serreze said.

Both ships, which carried cargo for a power plant project in Surgut, Siberia, were escorted by a pair of Russian icebreakers during portions of their journey. The Beluga Fraternity left South Korea on July 23, followed by the Beluga Foresight on July 28.

They arrived at the Novy Port, a major Russian shipping one on the west side of the Ob Gulf, an open body of water that stretches from the Ob River delta in the south to the Kara Sea in the north.

Verena Beckhusen, a spokeswoman for Beluga, said the Beluga Fraternity had already hoisted anchor and

left Novy Port on Thursday. The Beluga Foresight is scheduled to cast off Saturday after its departure "was postponed due to bad weather."

Russia has long used its northern coast for shipping fuel, supplies and other goods to its remote Arctic settlements, though funding for such shipments dwindled after the Soviet collapse.

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8. Alaska to have one of eight new federal climate-change centers

Anchorage Daily News
September 14, 2009

WASHINGTON, D.C. -- The Interior Department is creating eight regional response centers, including one based in Alaska, to address the impact of climate change on the people and land overseen by the agency.

Saying that many of the effects of climate change are due to what he called the "failed energy policy" of the previous administration, Interior Secretary Ken Salazar on Monday signed an order creating the centers.

The goal, Salazar said in his executive order, is to apply scientific tools to increase the understanding of climate change as well as coordinate effective responses for tribes and the land, water, ocean, fish and wildlife and cultural heritage resources managed by the Interior Department.

Alaska got its own center because the state already is seeing many of the effects of climate change, said Kendra Barkoff, "People tend to think Alaska is a barometer of what else is going on climate-change-wise," she said.

The president's budget has \$10 million to establish the eight climate change response centers, which will be managed by the U.S. Geological Survey.

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