



Northern Climate ExChange

Independent Information - Shared Understanding - Action on Climate Change

NCE Update January 6, 2010



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Announcements

1. Worldwatch Institute Report: Renewable Revolution: Low-Carbon Energy by 2030

Authors: Janet L. Sawin And William R. Moomaw
ISBN 13: 978-1-878071-93-4 Paperback, 52 pages

Renewable Revolution: Low-Carbon Energy by 2030: "The transition to a highly efficient economy that utilizes renewable energy is essential for developed and developing countries alike. This is the only way that degradation of Earth's climate system can be halted, and the only real option for raising billions of people out of poverty. The current reliance on fossil fuels is not supportable by poor developing countries, and increasing demand for fossil fuels is creating dangerous competition for remaining available resources of oil and gas. The challenge is to devise a transition strategy that improves the lives of all citizens by providing them with essential energy services that do not disrupt the climate system, degrade the environment, or create conflict over resources".

[Download Report Now](#)
[Summary](#)

www.worldwatch.org



2. Call for Proposals 2010-2011: The Climate Change and Health Adaptation Program - Northern First Nations and Inuit Communities.

The Climate Change and Health Adaptation Program is accepting proposals from Northern First Nations and Inuit Communities for the 2010-2011 fiscal year.

The Climate Change and Health Adaptation Program funds community-centred research, where the research is done by community members/organizations for the benefit of their community.

Application Deadline: January 24th, 2010

For more information and how to apply, contact:
Erin Myers, Program Officer, Health Canada
(613) 957-2490 or e-mail erin_myers@hc-sc.gc.ca

3. Report - Adventure Tourism Companies & Climate Change

Adventure Tourism Companies & Climate Change: *Observations from the Himalaya, Amazon, and Polar Regions Spark Adaptation Strategies for Business*" University of Cambridge in collaboration with Xola Consulting, Inc, December 2009.

[Download Executive Summary](#)

[Download Full Report](#)

www.xolaconsulting.com

4. Student Travel Scholarships: State Of The Arctic Conference, Miami, Florida, USA, 16-19 March 2010

Travel support is available for students to attend the **State of the Arctic Conference**, to be held 16-19 March 2010 in Miami, Florida.

The State of the Arctic Conference will be a major milestone for arctic science by providing an international forum to review the current knowledge of the arctic system in a time of rapid environmental change and point to future research, resource management, and policy directions. Participants will include a diverse and interdisciplinary group of scientists, students, agency personnel, policy makers, stakeholders and northern representatives, and media.

For more information and to apply, go to:
<http://soa.arcus.org/logistics/student-scholarship>

Deadline: Friday, 15 January 2010.

5. Course: Climate Change in the Circumpolar World - Yukon College

Climate change is a critical topic for the North and once again, Yukon College is offering a course on **Climate Change in the Circumpolar World**.

The 3-credit course, **GEOG 290**, looks at the science and local knowledge of climate, where we are coming from and where we are going. It examines the impacts of a warming globe on the North and how the North feeds back to the entire planet. The course addresses responses to climate change from adaptation to mitigation and from the personal to the political.

This course is ideally suited to decision makers, resource people and researchers who need a clearer understanding of this crucial topic.

When: Tuesdays 7-10 pm. from **January 5th to mid-April, 2010.**

Instructor: **John Streicker**

For more information on the course; [Download the pdf.](#)

6. Stratigraphy Journal Article: *New quantitative evidence of extreme warmth in the Pliocene Arctic*

Stratigraphy: A journal dedicated to the central role of stratigraphy in the earth sciences.

Featured Article of the Month:

[***New quantitative evidence of extreme warmth in the Pliocene Arctic***](#)

by Marci M. Robinson, U.S. Geological Survey, Reston, VA, USA

www.micropress.org

Articles

1. No relief for Arctic in minimalist climate deal

Copenhagen Accord non-binding; more talks to follow next year

By Jane George
Nunatsiaq News
December 19, 2009

COPENHAGEN - A last-minute agreement on climate change worked out Dec. 18 between the U.S., China, Brazil, India and South Africa at the COP15 climate change conference in Copenhagen offers little hope for improving dire scientific forecasts for a warming Arctic.

A draft of the agreement, to be known as the "Copenhagen Accord," includes the following provisions:

- the increase in average global temperatures must be limited to 2 C;
- rich countries will give \$30 billion to poor countries before 2012, to help them adapt to climate change and reduce greenhouse gas emissions;
- action to help small island countries, African countries and the world's poorest countries, but not Arctic regions, is "urgently required;"
- rich countries set "a goal" of \$100 billion to be given to poor, vulnerable countries by 2020, to be put into a "Copenhagen Green Climate Fund;"
- reporting systems under which countries must communicate how they plan to limit and measure greenhouse gas emissions;
- a second set of climate talks in one year, aimed at creating a legally, binding agreement.

This is the first time that the world's two biggest greenhouse gas emitters, the U.S. and China, have worked face-to-face on a climate change agreement.

But the deal contains no legally-binding emissions targets.

Yvo de Boer, executive secretary of the United Nations Framework Convention on Climate Change, and U.S. President Barack Obama each described the deal, reached after talks moved into overtime late in the

evening of Dec. 18, as "modest."

At a news conference, Obama defended the agreement by pointing to its flexibility, saying it lets nations adjust their emissions targets according to science. The fact that the accord isn't legally binding didn't appear to be a problem for Obama, who said treaties are only as strong as the commitments that countries make.

He also said that, for the first time, developing nations like India have agreed to make cuts to greenhouse gas emissions, that it's a first step in building trust between rich and poor nations, and that all nations, whether rich or poor, must do something.

The 1997 Kyoto Protocol, which will continue for now, required that only developed countries make cuts to greenhouse gas emissions. This means, Obama said, that the Copenhagen accord breaks the "fundamental deadlock" that has plagued climate change talks in the past.

The accord will likely include Canada's previous commitment to reduce greenhouse gas emissions to 20 per cent below 2006 levels by 2020, and abandon its previous commitment under the 1990 Kyoto Accord for reductions to 6 per cent beneath 1990 levels - a goal Canada never came close to meeting.

Prime Minister Stephen Harper kept a low profile at the talks, letting Environment Minister Jim Prentice speak on behalf of Canada at a plenary session.

But at a press conference Dec. 18, Harper said he was "comfortable" with the five-nation deal, which was brokered by U.S. president Barack Obama and Chinese premier Wen Jiabao.

Harper defended the controversial Alberta tar sands, saying they account for only four per cent of Canada's greenhouse gas emissions.

But he had little to say about what Canada will do to meet its stated emissions targets.

And there's little in the document that offers any hope of preventing big temperature increases in the Arctic that exceed global averages.

The 2 C global increase set out in the Copenhagen Accord would still see Arctic temperatures rise by at least 3 to 6 C higher by 2100.

The accord is not likely to please Arctic leaders.

"To be effective, the process emerging from this conference must recognize the impact of climate change on Inuit by pursuing targets that will eliminate further climate change impacts on the Arctic," Mary Simon, the president of Inuit Tapiriit Kanatami said in an email.

None of the \$100 billion committed by the rich nations of the world by 2020 would go to Inuit and other indigenous peoples of the Arctic - because they already live within some of the richest nations of the world: Canada, the United States, Greenland, the Nordic nations and Russia.

There's no specific acknowledgment of the vulnerability of Arctic peoples in the accord which mentions "least developed countries, small island developing states," and "the need of countries in Africa."

Arctic and indigenous negotiators also wanted to see acknowledgment of human rights and the rights of indigenous peoples in the text and Inuit wanted an acknowledgment of Arctic peoples affected by the loss of snow and ice.

Speaking to press shortly before midnight, Lumumba Stanislaus-Kaw Di-Aping, a Sudanese diplomat who was chief negotiator for the G77 group of developing nations, slammed the accord, saying it won't keep small island nations from drowning and that the money offered for mitigation and adaptation isn't enough.

Protesters also gathered outside an entrance to the Bella Centre chanting "shame, shame" and "bad deal, no deal," while brandishing a larger-than-life-size image of Obama.

But, when he spoke to the conference shortly after noon Dec. 18, Obama urged rich and poor governments to support the deal on climate change - even if it is "not perfect."

"You would not be here unless you - like me - were convinced that this danger is real. This is not fiction, this is science. Unchecked, climate change will pose unacceptable risks to our security, our economies, and our planet," Obama said.

One by one, the leaders of India, South Africa, Russia, Korea, and other nations, speaking after Obama, threw their support behind Obama's call for compromise.

But Juan Evo Morales of Bolivia slammed the proposed 2 C temperature rise, saying it doesn't do enough to save people whose lives are endangered by climate change.

The leftist leader of Venezuela, Hugo Chavez then spoke, calling Obama's financial commitments a "joke" and "fraudulent."

Quoting Cuba's Fidel Castro, Chavez said the final day of the climate change conference would be "an inglorious closing."

Chavez said his country, along with Bolivia, Cuba, Nicaragua and several Caribbean island nations, would not accept any deal promoted by the U.S., and walked out.

But German chancellor Angela Merkel, British prime minister Gordon Brown and other European and Asian leaders have indicated they will support the watered-down accord.

The next step comes a year from now, in 2010, when officials from around the world will try to craft a legally-binding agreement on climate change at a meeting in Mexico City.

NDP leader Jack Layton said that Canada failed to show leadership at the Copenhagen talks.

And Liberal leader Michael Ignatieff said Harper went to Copenhagen with no plan other than to follow the lead of the U.S.

"We need an aggressive, made in Canada, climate-change plan now," Ignatieff said.

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2. Alaska coast erosion threat to oil, wildlife

By Yereth Rosen

Reuters

December 21, 2009

A portion of Alaska's North Slope coastline is eroding at a rate of up to 45 feet (14 meters) a year, posing a threat to oil operations and wildlife in the area, according to a new report issued by scientists at the University of Colorado.

Warmer ocean water has thawed the base of frozen bluffs and destroyed natural ice barriers protecting the coast, causing large earth chunks to fall each summer, the scientists said.

"What we are seeing now is a triple whammy effect," study co-author Robert Anderson, an associate professor at the University of Colorado's Department of Geological Sciences, said. "Since the summer Arctic

sea ice cover continues to decline and Arctic air and sea temperatures continue to rise, we really don't see any prospect for this process ending."

The scientists studied coastline midway between Point Barrow, the nation's northernmost spot, and Prudhoe Bay, site of the nation's biggest oil fields. The erosion, if it continues, could ultimately be a problem for energy companies such as Exxon Mobil Corp ([XOM.N](#)) and BP Plc ([BP.L](#)).

Findings were presented last week at the annual meeting of the American Geophysical Union in San Francisco. They backed up other studies of erosion along Alaska's Beaufort Sea coastline.

A study by U.S. Geological Survey scientists published in February found that erosion along a stretch of Alaska coastline during 2002 to 2007 was twice as fast as in the period from 1955 to 1979. That USGS study also found erosion occurring at a rate of 13.6 meters (44.6 feet) annually from 2002 to 2007.

The three-year University of Colorado study aimed to examine how erosion is occurring, said co-author Irina Overeem, a scientist at the University's Institute of Arctic and Alpine Research.

The scientists employed time-lapse photography, global positioning systems, meteorological monitoring, and analysis of sediment and sea-ice distribution.

Photographic images snapped every six hours during the around-the-clock sunlight of summer were particularly dramatic, Overeem told Reuters.

"There's a notching effect that just notches, notches, notches and then topples over," she said. "The cliffs are more than half ice -- they're basically dirty icebergs -- so warm water, stronger waves and higher wave action quickly carves them away," she said.

Although the study area holds no communities, there is infrastructure at risk, mostly abandoned military and oil-field sites and their associated waste dumps, the scientists said. Also at risk are ponds and lakes that support migratory shorebirds.

The threat of collapsing military and oil-field infrastructure, including toxics-laden waste, has prompted several government agencies to launch emergency cleanup programs.

The U.S. Bureau of Land Management since 2005 has cleaned up three old, erosion-threatened wells and plans to start in on a fourth well later this winter, said Wayne Svejnoha, branch chief for energy and minerals. Each well cleanup takes about two months and costs \$12 million to \$14 million, Svejnoha said.

Erosion threats to shorebirds were confirmed by another federal manager.

"The erosion is very obvious," said Rick Lanctot, Alaska shorebird coordinator for the U.S. Fish and Wildlife Service. In some spots, saltwater has inundated lakes and ponds, killing off plants that birds eat, while heavy wave action has displaced driftwood used as nest sites, said Lanctot, who has worked there since 1991.

(Reporting by Yereth Rosen; editing by Bill Rigby, Gary Hill)

www.reuters.com

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3. Arctic Could Face Warmer and Ice-Free Conditions

U.S. Geological Survey
December 29, 2009

There is increased evidence that the Arctic could face seasonally ice-free conditions and much warmer

temperatures in the future.

Scientists documented evidence that the Arctic Ocean and Nordic Seas were too warm to support summer sea ice during the mid-Pliocene warm period (3.3 to 3 million years ago). This period is characterized by warm temperatures similar to those projected for the end of this century, and is used as an analog to understand future conditions.

The U.S. Geological Survey found that summer sea-surface temperatures in the Arctic were between 10 to 18°C (50 to 64°F) during the mid-Pliocene, while current temperatures are around or below 0°C (32°F).

Examining past climate conditions allows for a true understanding of how Earth's climate system really functions. USGS research on the mid-Pliocene is the most comprehensive global reconstruction for any warm period. This will help refine climate models, which currently underestimate the rate of sea ice loss in the Arctic.

Loss of sea ice could have varied and extensive consequences, such as contributions to continued Arctic warming, accelerated coastal erosion due to increased wave activity, impacts to large predators (polar bears and seals) that depend on sea ice cover, intensified mid-latitude storm tracks and increased winter precipitation in western and southern Europe, and less rainfall in the American west.

"In looking back 3 million years, we see a very different pattern of heat distribution than today with much warmer waters in the high latitudes," said USGS scientist Marci Robinson. "The lack of summer sea ice during the mid-Pliocene suggests that the record-setting melting of Arctic sea ice over the past few years could be an early warning of more significant changes to come."

Global average surface temperatures during the mid-Pliocene were about 3°C (5.5°F) greater than today and within the range projected for the 21st century by the Intergovernmental Panel on Climate Change.

Read the full article at <http://micropress.org/stratigraphy/>.

Scientists studied conditions during the mid-Pliocene by analyzing fossils dated back to this time period. The USGS led this research through the Pliocene Research, Interpretation and Synoptic Mapping group. The primary collaborators in PRISM are Columbia University, Brown University, University of Leeds, University of Bristol, the British Geological Survey and the British Antarctic Survey. Learn more about [PRISM research](#).

www.usgs.gov

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4. Scientists go to extremes for Arctic research

By Debra McKinney
Anchorage Daily News
December 21, 2009

If you want to know how polar bears are doing, it's not enough to spy on them with satellite telemetry and other technology. You have to go where they live.

You have to tap into the stories these bears carry in and on their bodies, and drop in on the tiniest of organisms beneath the places they walk, the ones that feed the shrimp-like creatures that feed the fish that feed the seals that feed the bears.

That's what scientists did for five weeks this fall aboard the U.S. Coast Guard Cutter Polar Sea as they addressed the question: How are polar bears coping with sea-ice loss due to climate change?

To get some answers, they traveled to a part of the world few get to see, and far fewer get to see from beneath the sea ice. Or would want to.

"It's definitely not for everyone," said Katrin Iken, associate professor of marine biology at the University of Alaska Fairbanks, who led the team of ice researchers from UAF.

The ice divers, layered in polypropylene, fleece and dry suits, went to work through holes cut in the ice to gather samples from biological communities associated with sea ice. Tethered to a team member above, they went as deep as 40 feet to explore the bottoms of ice ridges -- the underwater version of the pressure ridges up top -- for a look at what lives down there.

In the big picture, it's all about understanding what melting ice means to the larger food web in the Arctic.

To Iken, the underside of sea ice is a beautiful and fascinating place.

Shawn Harper, team member and underwater photographer, calls it "captivating" and "otherworldly."

Among those working up top was George Durner, an Anchorage research zoologist with the USGS Alaska Science Center. He's been capturing and collecting data on polar bears since the early 1990s, helping keep tabs on the southern Beaufort Sea population, currently estimated at 1,500. Durner and his colleagues do the majority of their sampling in the spring based out of Barrow, Prudhoe Bay and Kaktovik, flying 50-100 miles offshore.

"You can only fly a helicopter so far before you have to go back and get more fuel," he explained.

The Polar Sea expedition offered a chance to go places he's never been able to access before, including this summer's ice pack, the edge of which was more than 200 miles off the coast of Alaska.

Access to this remote sea-ice habitat will help researchers understand how bears that spend their summers in profoundly different ways fare by comparison in the face of climate change.

In the past two decades, due to extensive sea ice retreat, bears have split up, either spending their summers on the deep-water pack ice far offshore, or spending it on land. Based on radio telemetry, researchers estimate that at least 80 percent stay with the pack ice. And what they are hearing from seal researchers is that there aren't a lot of seals out that far.

One problem: This year, the extent of the summer sea ice was the third-lowest on record.

Researchers had their sights on 11 previously collared bears for recapture and comparative sampling. But because the ice was too thin to do their work safely, for themselves and for the bears, they were able to capture and sample only four.

"The irony of it all is the very processes whose effect we are attempting to study was basically keeping us from doing our research," Durner said. "But we did get some very good data from these animals, and we learned a lot."

He and other project scientists, including collaborators from the University of Wyoming and the U.S. Fish & Wildlife Service, are still analyzing that data, so it will be awhile before they can say what it all means.

That, he said, is going to take a lot of serious thinking.

www.adn.com

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5. Arctic mix-up

By Harvey Leifert
Nature Reports Climate Change
December 17, 2009

The traditionally quiescent Arctic Ocean may soon become a more active environment owing to its diminishing sea ice. Floating ice impedes winds from transferring energy to the ocean, thereby minimizing waves both on and beneath the surface. Subsurface internal waves have an important role in mixing water between various depths, but this process occurs less in the Arctic than in other ocean basins.

In 2002 and 2003, University of Washington researchers Luc Rainville and Rebecca Woodgate moored instruments at 70 and 110 metres below the surface in the Chukchi Sea, north of the Bering Strait, an area typically iced over in winter and ice-free in summer. They found that storms with winds stronger than ten metres per second occurred all year, but they generated significant internal waves only in the absence of sea ice. The mixed layer of water resulting from those waves grew rapidly during summer.

As Arctic ice continues to decline year-round, the researchers anticipate increased mixing from internal waves. This could affect the success of phytoplankton blooms, the base of the Arctic food web. It may also affect exchanges of water between the Arctic and other oceans, with implications for climate connections to more southerly regions.

www.nature.com

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6. Permafrost Thaw May Accelerate Arctic Groundwater Runoff

ScienceDaily
December 31, 2009

As the Arctic warms, permafrost will degrade, potentially resulting in increased groundwater runoff as frozen ground that had blocked the flow of water melts. To investigate how groundwater systems will evolve as surface temperatures rise, Bense et al. developed a model to simulate an idealized aquifer covered by a layer of permafrost.

They ran the simulation under three scenarios, starting with three initial surface temperatures (-2, -1.5, and -1 degrees Celsius, or 28.4, 29.3 and 30.2 degrees Fahrenheit), corresponding to different permafrost thicknesses. In each case, they increased the average seasonal surface temperature by 3 degrees C (5.4 degrees F) over 100 years, an average of model predictions for temperature increase in the Arctic over the next century.

After the warming period, in each scenario the temperature was then held constant for the next 1100 years.

The authors found that although the initial distribution of ice influences the response, in all cases groundwater flow to streams and rivers accelerates over time. In fact, the results indicate that substantial increases in groundwater flow are likely over the next few centuries even if surface air temperatures stabilize at current levels.

The research is published in *Geophysical Research Letters*. Authors include V. F. Bense: School of Environmental Sciences, University of East Anglia, Norwich, UK; G. Ferguson: Department of Earth Sciences, Saint Francis Xavier University, Antigonish, Nova Scotia, Canada; H. Kooi: Faculty of Earth and Life Sciences, VU University, Amsterdam, Netherlands.

www.sciencedaily.com

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7. Canada panel backs Arctic pipeline conditionally

By Jeffery Jones
Reuters

December 30, 2009

CALGARY, Alberta (Reuters) - The C\$16.2 billion (\$15.4 billion) Mackenzie pipeline in Canada's Arctic should be allowed to proceed, provided 176 recommendations aimed at securing socioeconomic benefits and minimizing environmental damage are followed, regulators ruled on Wednesday.

In a much-anticipated report, the Joint Review Panel said it believed the huge gas project would bring overall benefits to Canada's Northwest Territories and avoid major ecological impact if the oil companies proposing the line and governments follow its list of measures.

The list is as diverse as analyzing the impact of climate change on facilities buried in permafrost, monitoring grizzly bear dens, and assessing if alcohol and drug abuse programs in the sparsely populated region are adequate.

"The Mackenzie Gas Project and associated Northwest Alberta Facilities would provide the foundation for a sustainable northern future," the seven-member panel said. "The challenge to all will be to build on that foundation."

The pipeline would carry at least 1.2 billion cubic feet of gas a day to the Alberta border from fields in the Mackenzie Delta near the Beaufort Sea. In Alberta, the gas could be routed to numerous markets in Canada and the United States.

The JRP report, which concentrated on the project's environmental, social and economic impact, comes more than two years after public hearings into the development ended. The project is led by Imperial Oil Ltd.

Imperial and its partners welcomed what appears to be a vote of confidence for the long-delayed project, but could not say yet if any of the recommended measures appear onerous, spokesman Pius Rolheiser said.

The company has three weeks to respond to the report.

"It would be fair to say that we're pleased that the JRP has concluded that, with appropriate measures to mitigate potential impacts, the project be allowed to proceed," Rolheiser said.

Imperial's partners are Royal Dutch Shell, ConocoPhillips, Exxon Mobil Corp, and Aboriginal Pipeline Group.

Canada's National Energy Board will use the JRP report to help make its decision on whether the project can go ahead. That decision is expected in September.

(To view the report's executive summary, including the list of recommendations, click [here](#))

Delays, Rising Costs

The Mackenzie project was first envisioned in the 1970s after oil companies discovered large gas deposits in Canada's Arctic. Imperial and its partners began studying the current incarnation of the project in 2000 and filed regulatory applications four years later.

Since then, the Mackenzie project has been beset with a big cost increase, regulatory delays, lengthy talks with Ottawa over fiscal breaks and a transformation of gas markets due to the recession and development of massive shale gas reserves located close to major U.S. markets.

Still, northern communities see the project as an opportunity for badly needed economic development, one that could provide careers for young people and spark spin-off businesses in the rugged region.

As part of a deal with the oil companies, aboriginal groups along the proposed 1,220 km (760-mile) route have the right to own up to one-third for the pipeline.

Environmental groups that opposed the project, such as the Sierra Club, argued during the JRP hearings that the bulk of the gas would be used to fuel development of Alberta's oil sands.

(Reporting by Jeffrey Jones; editing by Peter Gallow

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8. Ecosystems strain to keep pace with climate

By Steve Gorman
Reuters
December 24, 2009

LOS ANGELES (Reuters) - Earth's various ecosystems, with all their plants and animals, will need to shift about a quarter-mile per year on average to keep pace with global climate change, scientists said in a study released on Wednesday.

How well particular species can survive rising worldwide temperatures attributed to excess levels of heat-trapping "greenhouse" gases emitted by human activity hinges on those species' ability to migrate or adapt in place.

The farther individual species -- from shrubs and trees to insects, birds and mammals -- need to move to stay within their preferred climate, the greater their chance of extinction.

The study suggests that scientists and governments should update habitat conservation strategies that have long emphasized drawing boundaries around environmentally sensitive areas and restricting development within those borders.

A more "dynamic" focus should be placed on establishing wildlife corridors and pathways linking fragmented habitats, said research co-author Healy Hamilton of the California Academy of Sciences.

"Things are on the move, faster than we anticipated," she told Reuters. "This rate of projected climate change is just about the same as a slow-motion meteorite in terms of the speed at which it's asking a species to respond."

The new research suggests that denizens of mountainous habitats will experience the slowest rates of climate change because they can track relatively large swings in temperature by moving just a short distance up or down slope.

Thus, mountainous landscapes "may effectively shelter many species into the next century," the scientists wrote in the study, which is to be published in Thursday's issue of the journal *Nature*.

This is especially crucial for plant species, which due to their being rooted in the ground cannot migrate at nearly the pace of animals in response to habitat changes.

Climate change will be felt most swiftly by inhabitants of largely flat landscapes, such as mangroves and prairie grasslands, where the rate of warming may more than double the quarter mile per year average calculated for ecosystems generally, the study found.

Nearly a third of the habitats studied in the report face climate change rates higher than even the most optimistic plant migration estimates.

Lowland deserts are likewise subject to a higher velocity of climate change, although the trend toward protecting large swaths of desert may ease the problem there.

By contrast, much of the world's forest habitats and grasslands already have been severely fragmented by development, making mitigation of climate change in those landscapes harder and leaving their species more vulnerable.

The velocities charted in the report were based on the "intermediate" level of projected greenhouse gas emissions assumed over the next century by the U.N.'s Intergovernmental Panel of Climate Change.

(Editing by [Mary Milliken](#) and [Bill Trott](#))

www.uk.reuters.com

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9. No "Armed Mad Dash for Resources" Foreseen in the Arctic

Fridtjof Nansen Institute
December 17, 2009

With climate change making the Arctic gradually more accessible, some observers have suggested that interest in Arctic natural resources and disputed marine borders could take on a military aspect. A new FNI study refutes this view, finding that dispassionate diplomacy is a more likely and rational way of dispute resolution than military confrontation.

'Contrary to the general picture drawn by the media and some commentators over the last couple of years, the Arctic region does *not* suffer under a state of virtual anarchy. The era when states could claim rights to territory and resources by simply planting their flag is long gone' says law of the sea expert [Øystein Jensen](#), one of researchers behind the study. He refers to the 2007 Arktika expedition that planted a Russian flag into the seabed below the North Pole point, an event which raised concerns in Arctic capitals, and sparked off a round of media reports on an "Arctic race for territory and resources".

'The basic fact here is that the Arctic Ocean is an *ocean*, and as such, regulated by the law of the sea. Previous tendencies to question the legal status of the Arctic Ocean as a sea area - due to it being predominantly ice-covered - stand no chance of being accepted today. At the outset, there is thus no support in international law to treat the waters of the frozen North differently from other maritime spaces,' Jensen stresses.

'Notably, the United Nations Convention on the Law of the Sea - the relevant legal framework for national legislation in most state-to-state relations today - contains a clause reserved especially to ice-covered waters. The Convention thus leaves little doubt that a broad consensus exists as to the question of the applicability of the law of the sea to all parts of the Arctic Ocean,' he explains.

This was confirmed at the Ilulissat summit in Greenland in 2008 where all the Arctic coastal states - including the US, not yet a party to the Law of the Sea Convention - recognized the law of the sea as the starting point and a solid foundation for how regional and outside actors should act in the Arctic.

'Since the issues some call "security policy challenges" are, in fact, already largely regulated by international law that most states find it to their benefit to observe, the room for conflict is limited. Issues and disputes whose resolution procedures are not clearly lined out in international law, are relatively minor. Under a sober *realpolitik* analysis, trying or threatening to solve these disputes by military means would simply not be worth it, the negative political and legal ramifications would be too large,' says political scientist [Svein Vigeland Rottem](#), co-author of the study.

In their study, the researchers have focused on case studies involving Norwegian-Russian relations in the Barents Sea, including delimitation of unresolved maritime boundaries, the status of the waters and continental shelf around Svalbard and management of marine resources. The results of each of these case studies support the overall conclusion that there is little legal space and little rational role for military conflict resolution in the Arctic.

Although the case studies were limited geographically as well as topically, Jensen and Rottem believe their

results are generally applicable to the entire Arctic as it is the same legal framework that applies across the region.

'A description of the situation in the Arctic as an "armed mad dash for resources" seems not only overdrawn, it disregards the specific contexts of foreign policy and international law,' the two researchers conclude.

The results of the study are being published as: [Øystein Jensen](#) and [Svein Vigeland Rottem](#): '[The Politics of Security and International Law in Norway's Arctic Waters](#)'. *Polar Record*, Vol 46, No 1, 2010, pp. 75-83.

www.fni.no

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10. Methane release 'looks stronger'

Scientists have uncovered what appears to be a further dramatic increase in the leakage of methane gas that is seeping from the Arctic seabed.

By Michael Fitzpatrick
BBC News
January 6, 2010

Methane is about 20 times more potent than CO₂ in trapping solar heat.

The findings come from measurements of carbon fluxes around the north of Russia, led by Igor Semiletov from the University of Alaska at Fairbanks.

"Methane release from the East Siberian Shelf is underway and it looks stronger than it was supposed [to be]," he said.

Professor Semiletov has been studying methane seepage in the region for the last few decades, and leads the International Siberian Shelf Study (ISSS), which has launched multiple expeditions to the Arctic Ocean.

The preliminary findings of ISSS 2009 are now being prepared for publication, he told BBC News.

Methane seepage recorded last summer was already the highest ever measured in the Arctic Ocean.

High seepage

Acting as a giant frozen depository of carbon such as CO₂ and methane (often stored as compacted solid gas hydrates), Siberia's shallow shelf areas are increasingly subjected to warming and are now giving up greater amounts of methane to the sea and to the atmosphere than recorded in the past.

This undersea permafrost was until recently considered to be stable.

But now scientists think the release of such a powerful greenhouse gas may accelerate global warming.

Higher concentrations of atmospheric methane are contributing to global temperature rise; this in turn is projected to cause further permafrost melting and the release of yet more methane in a feedback loop.

A worst-case scenario is one where the feedback passes a tipping point and billions of tonnes of methane are released suddenly, as has occurred at least once in the Earth's past.

METHANE HYDRATES

- Methane gas is trapped inside a crystal structure of water-ice.

- The gas is released when the ice melts, normally at 0C.

- At higher pressure, ie under the ocean, hydrates are stable at higher temperatures.

Such sudden releases have been linked to rapid increases in global temperatures and could have been a factor in the mass extinction of species.

According to a report by the US National Oceanic and Atmospheric Administration (Noaa), the springtime air temperature across the region in the period 2000-2007 was an average of 4C higher than during 1970-1999.

That is the fastest temperature rise on the planet, claims the university.

The recent thaw over the last decade means that some of the large reserve of carbon from organic material such as dead animals and plants in sediments is now being released into the sea and into our atmosphere.

Trapped below that is the methane hydrate now warming and leaking through holes in the defrosting sediments.

link: '[How methane escapes from the seabed](#)'.

Previously it was thought much of this gas was absorbed into the sea.

But according to a recent report that Professor Semiletov and his team compiled for the environmental group WWF, the shallow depth of arctic shelves means that methane is reaching the atmosphere without reacting to become CO2 dissolved in the ocean.

Professor Semiletov's fellow researcher aboard the Russian icebreaker that carries the ISSS team each year is Professor Orjan Gustafsson from Stockholm University in Sweden.

He said that methane measured in the atmosphere around the region is 100 times higher than normal background levels, and in some cases 1,000 times higher.

'No alarm'

Despite the high readings, Professor Gustafsson said that so far there was no cause for alarm, and stressed that further studies were still necessary to determine the exact cause of the methane seepage.

"It is important now to understand how fast it is being released and how much is being released," he said.

However, there is a real fear that global warming may cause Siberia's subsea permafrost to thaw.

Some estimates put the amount of carbon trapped in shelf permafrost at 1,600 billion tonnes - roughly twice as much carbon as in the atmosphere now.

The release of this once captive carbon from destabilised ocean sediments and permafrost would have catastrophic effect on our climate and life on Earth, warn the scientists.

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