

Northern Climate ExChange

Independent Information - Shared Understanding - Action on Climate Change

NCE Update May 20, 2009

Article Headlines:

- 1. Environment Forum to be Held this Month**
- 2. Let locals determine policies for Canada's North: Senate report**
- 3. A new insight into the decline of the Arctic sea ice cover**
- 4. As Alaska Glaciers Melt, It's Land That's Rising.**
- 5. World's Large Marine Ecosystems Heating Up, Altering Fisheries Catches**
- 6. Climate change odds much worse than thought**
- 7. Health effects of climate change will affect billions: report**
- 8. Development goals all at sea.**

Quick Links

[NCE Website](#)
[What's New](#)
[About NCE](#)
[Climate Change North Website](#)
[Impacts & Adaptation](#)

Distribution List

[Join Our Mailing List!](#)

Announcements

1. The Senate Committee on Energy the Environment and Natural Resources' 6th Annual Report: "With Respect Canada's North"

The Senate Committee on Energy, the Environment and Natural Resources, travelled to the Western Arctic in June 2008 to understand what climate change, resource development and the new focus on sovereignty means for the North. The final report entitled "With Respect, Canada's North" released May 13, 2009, details the committee's view of partnership opportunities between the federal government and northerners to meet the coming challenges.

To download the report [click here](#).

2. Arctic Marine Shipping Assessment 2009 Report Released

The Protection of the Arctic Marine Environment working group of the Arctic Council has released the Arctic Marine Shipping Assessment 2009 Report. This extensive and well-illustrated document, supported by Canada, Finland and the United States and recently approved by the Arctic Council, represents a four-year effort to consider and review all aspects of Arctic shipping. It includes extensive documentation of shipping activities from a baseline year (2004) and future projections in key areas such as environmental protection, marine infrastructure, human dimensions, and governance. It contains a series of very useful maps and charts.

To download the report [click here](#)

3. Young Leaders Summit on Northern Climate Change



Inuvik, Northwest Territories - August 17-20, 2009

Are you concerned about climate change and what it means for the future? Do you want to make your voice heard and be part of the solution? The Young Leaders' Summit on Northern Climate Change is your opportunity!

For four days this August, young leaders will converge in Inuvik, Northwest Territories, to discuss climate change, share their stories and build their skills. The summit will empower young leaders to tackle the greatest challenge facing the planet-climate change. The four action-packed days will be a mixture of outdoor field-trips, indoor lectures and participatory activities.

Visit the [summit website](#) for more information.

www.climateleaders.ca/

Articles

1. Environment Forum to be Held this Month

Yukon Government
Press Release #09-121
May 19, 2009

WHITEHORSE - The Yukon government will host the third annual Environment Forum later this month at the Yukon College gym at the Ayamdigut Campus in Whitehorse.

"This year our focus will be on building awareness of how one's day-to-day life and community activities are connected to environmental management," Environment Minister Elaine Taylor said. "We look forward to hearing from participants about their experiences as well as sharing information about government, municipal and community-based programs."

An Environment After Hours presentation will be held at 7 p.m. on May 20 in the Beringia Centre. Yukon artist, film-maker and photographer Marten Berkman will be the guest speaker. The North is Berkman's home and his inspiration, where he focuses his eyes and lens on landscapes and their inhabitants. His presentation will explore how studies and photographs affect human relationships with the land as well as how communities are the critical membrane connecting art, science and people with the planet.

About 200 delegates from all levels of government, non-government organizations, business, industry and other sectors are expected to attend the day-long workshop on May 21.

Four moderated panel discussions will be held over the course of the day-long forum. Topic discussions will range from recycling and waste management to climate change in the classroom and how to green your office.

This is the third year in a row that the Government of Yukon's Department of Environment has organized a forum.

www.gov.yk.ca/

[back to top](#)

2. Let locals determine policies for Canada's North: Senate report

CBC News
May 14, 2009

A Senate report released Thursday says the federal government should listen to people living in Canada's North before making decisions about the area, from Arctic sovereignty to climate change to natural resources.

The standing Senate committee on energy, the environment and natural resources issued its report after touring communities in the western Arctic in June 2008.

The committee, led by Conservative Senator David Angus (Quebec) and Liberal Senator Grant Mitchell (Alberta), concluded that Canadians south of 60 should not be forming policy for the North.

"It is very important, we would conclude, that the future of the North be defined by Northerners," Mitchell told reporters in Ottawa on Thursday.

The Senate report noted the federal government's current interest in Canada's North, especially in terms of ensuring Canada's sovereignty in the Arctic and dealing with climate change.

But Mitchell said people living in the North are coping with those issues as part of their daily lives.

"The roads are beginning to, in some places, look like roller-coasters," he said. "Structural problems are emerging with houses and buildings because the permafrost is melting."

A homeland, not just a resource

At the same time, the committee said a statement such as "Use it or lose it" - made by Prime Minister Stephen Harper in 2007, referring to Arctic sovereignty - implies that "Canada intends to make use of the North."

"Beyond just using the North as an economic or military frontier, we must respect that this is a homeland for Northerners," the Senate report reads in part.

"The federal government can and should play an important role in economic development and supporting climate change adaptation efforts, but this must be in partnership with all Northerners and according to their vision of the future."

Liberal Senator Tommy Banks (Alberta) said he is confident Arctic sovereignty issues will be settled fairly and peacefully.

"Our sovereignty in the North will not be determined by people with guns or with warships or with warplanes," Banks said. "They will be determined in the courts."

The 12 senators in the all-party committee toured Whitehorse, Yukon, and the N.W.T. communities of Yellowknife, Inuvik and Tuktoyaktuk, as part of its research for this report.

Among the nine recommendations in the report is one calling for immediate funding for an all-weather road to be built to Tuktoyaktuk, located north of Inuvik.

Having an all-weather road is a priority for people in the Arctic community of 870, Mayor Mervin Gruben said.

"They even call it the happy road. People are just happy to be working, and it's one of the busiest communities up north right now," Gruben said late Thursday.

The Senate report's other recommendations to the federal government include:

- Boost research funding in the North, particularly in tracking the effects of climate change.
- Encourage research on dealing with melting permafrost.
- Work out a resource-sharing agreement with the N.W.T. "in a way that will dedicate resource revenues to enhanced education, housing and health standards" for Northerners.
- Speed up the regulatory process on the proposed Mackenzie Valley natural gas pipeline.

www.cbc.ca

[back to top](#)

3. A new insight into the decline of the Arctic sea ice cover

Centre National de la Recherche Scientifique (CNRS)

May 13, 2009

The mechanical behavior of the Arctic sea ice cover appears to favor its rapid decline. Scientists from INSU-CNRS, Université J. Fourier and Université de Savoie have analyzed the trajectories of drifting buoys anchored in the ice and found that the mean drift rate and deformation rate of Arctic sea ice has strongly increased over the last three decades. These effects, related to the mechanical properties of the cover, contribute to the faster- than-expected decline of Arctic sea ice. This work is published in the 14 may 2009 issue of the Journal of Geophysical Research - Oceans.

Scientists from the Laboratoire de Glaciologie et Géophysique de l'Environnement of Grenoble (CNRS/Université J. Fourier) and the Laboratoire de Géophysique Interne et Tectonophysique of Chambéry (CNRS/Université J. Fourier/Université de Savoie), inspired by the 2006-2007 expedition of the polar schooner Tara, which drifted along the transpolar drift more than twice as fast as Nansen's Fram ship 115 years earlier, analyzed the trajectories of more than 600 buoys anchored into the ice over the last 30 years (1). They observed a substantial increase in the mean drift rate of the sea ice, equivalent to +10% per decade. Looking at the dispersion rate of the buoys, they also measured a strong increase in the mean

deformation rate of the sea ice, equivalent to +50% in both winter and summer. This combined acceleration of Arctic sea ice drift and deformation appears to be related to, and would actually strengthen, the thinning of the cover.

A close link between sea ice deformation and fracturing had previously been revealed by scientists from LGGE(2). Increased deformation leads to greater fracturing, which in turn leads to Arctic ocean warming through solar radiation in summer. This process accelerates sea ice thinning in summer and delays refreezing in early winter, decreasing the mechanical strength of the cover and leading to even more fracturing and greater drift speed and deformation. In addition, a more fractured, and hence more mobile, sea ice cover will be exported at a faster rate out of the Arctic towards the Atlantic. These two effects, combined with the mechanical properties of the sea ice cover, probably participate to the general decline of the Arctic sea cover.

The spectacular, and largely unexpected sea ice shrinkage observed in the summer of 2007 might be a good illustration of the interplay between sea ice deformation and decline, as the exceptional deformation rates measured by scientists in the winter of 2006-07 most likely contributed to the levels of deformation measured the following summer and therefore to the observed shrinkage. These complex processes and interactions, which are difficult to model in climate simulations, might partly explain why scientists have been unable to calculate the rate of decline of the Arctic sea ice cover.

Notes:

- 1) Dataset from the International Arctic Buoy Program ([View web site](#)). These buoys were originally launched to record sea level pressures and air temperatures over the Arctic
- 2) Weiss, J., Schulson, E.M., Stern, H.L. (2007), Sea ice rheology from in-situ, satellite and laboratory observations: Fracture and friction, Earth and Planetary Science Letters, 255, 1-8

References:

Rampal, P., Weiss, J. and Marsan, D., Positive trend in the mean speed and deformation rate of Arctic sea ice, 1979-2007, J. Geophys. Res., doi: 10.1029/2008JC005066, 14 May 2009

www2.cnrs.fr/en

[back to top](#)

4. As Alaska Glaciers Melt, It's Land That's Rising

By Cornelia Dean
New York Times
May 17, 2009

JUNEAU, Alaska - Global warming conjures images of rising seas that threaten coastal areas. But in Juneau, as almost nowhere else in the world, climate change is having the opposite effect: As the glaciers here melt, the land is rising, causing the sea to retreat.

Morgan DeBoer, a property owner, opened a nine-hole golf course at the mouth of Glacier Bay in 1998, on land that was underwater when his family first settled here 50 years ago.

"The highest tides of the year would come into what is now my driving range area," Mr. DeBoer said. Now, with the high-tide line receding even farther, he is contemplating adding another nine holes. "It just keeps rising," he said.

The geology is complex, but it boils down to this: Relieved of billions of tons of glacial weight, the land has risen much as a cushion regains its shape after someone gets up from a couch.

The land is ascending so fast that the rising seas - a ubiquitous byproduct of global warming - cannot keep pace. As a result, the relative sea level is falling, at a rate "among the highest ever recorded," according to a 2007 report by a panel of experts convened by Mayor Bruce Botelho of Juneau.

Greenland and a few other places have experienced similar effects from widespread glacial melting that began more than 200 years ago, geologists say. But, they say, the effects are more noticeable in and near

Juneau, where most glaciers are retreating 30 feet a year or more.

As a result, the region faces unusual environmental challenges. As the sea level falls relative to the land, water tables fall, too, and streams and wetlands dry out. Land is emerging from the water to replace the lost wetlands, shifting property boundaries and causing people to argue about who owns the acreage and how it should be used. And meltwater carries the sediment scoured long ago by the glaciers to the coast, where it clouds the water and silts up once-navigable channels.

A few decades ago, large boats could sail regularly along Gastineau Channel between Downtown Juneau and Douglas Island, to Auke Bay, a port about 10 miles to the northwest. Today, much of the channel is exposed mudflat at low tide. "There is so much sediment coming in from the Mendenhall Glacier and the rivers - it has basically silted in," said Bruce Molnia, a geologist at the United States Geological Survey who studies Alaskan glaciers.

Already, people can wade across the channel at low tide - or race across it, as they do in the Mendenhall Mud Run. At low tide, the navigation buoys rest on mud.

Eventually, as the land rises and the channel silts up, Douglas Island will be linked to the mainland by dry land, said Eran Hood, a hydrologist at the University of Alaska Southeast and an author of the 2007 report, "Climate Change: Predicted Impacts on Juneau."

When that happens, Dr. Hood said, the Mendenhall Wetlands State Game Refuge, 4,000 acres of boggy habitat, will be lost. "That wetland will have nowhere else to go," he said.

In some places along the coast, the change has been so rapid that kayakers whose charts are not up-to-the-minute can find themselves carrying their boats over shoals that are now so high and dry they now support grass or even small trees.

In and around Juneau, "you can walk around and see what was underwater is turning into grassland and eventually into forest," Dr. Hood said.

The topographical changes have threatened crucial ecosystems and even locally vital species like salmon. "The lifeblood of our region has been salmon species and their return - and what is the impact when they return and the streams are dry?" said Mayor Botelho, who was born and raised in Juneau. "The salmon is bound to our identity as a region, who we are."

He said he did not think that any species were in imminent danger, but added, "Anyone who is following climate change has to see that there are risks, perhaps great ones."

Dr. Hood said many people in Juneau had hoped to maintain a waterway called Duck Creek as a salmon stream. But small streams like that "appear to be drying out," he said. "There are a lot of people in town saying, Let's just let it return to a greenway."

Relative to the sea, land here has risen as much as 10 feet in little more than 200 years, according to the 2007 report. As global warming accelerates, the land will continue to rise, perhaps three more feet by 2100, scientists say.

The rise is further fueled by the movement of the tectonic plates that form the earth's crust. As the Pacific plate pushes under the North American plate, Juneau and its hilly Tongass National Forest environs rise still more. "When you combine tectonics and glacial readjustment, you get rates that are incomprehensible," Dr. Molnia said.

In Gustavus, where Mr. DeBoer's property is, the land is rising almost three inches a year, Dr. Molnia said, making it "the fastest-rising place in North America."

In addition to expanding the golf course, Mr. DeBoer is negotiating with the Nature Conservancy to preserve some of the newly emergent land. He can do both, he said, because the high tide line has pushed almost a mile out to sea since his family first homesteaded on the property.

Where the shoreline is relatively flat, "it doesn't take much uplift to make quite a bit of difference," Mr. DeBoer said.

Kristin White, a 28-year-old schoolteacher who grew up in Haines, a town north of here, is from another family in the area whose real estate grew as land rose. When her father tried to sell some property in Haines, she said, "he had to have it resurveyed."

But for Ms. White, who has vivid memories of visiting the Mendenhall glacier as a child, the gain in acreage has been bittersweet. Seeing the glacier retreat, she said, is "as if you lived in the Smoky Mountains and you were used to seeing certain peaks - and they disappeared. It's just totally, totally sad."

www.nytimes.com

[back to top](#)

5. World's Large Marine Ecosystems Heating Up, Altering Fisheries Catches

NOAA Scientists Contribute to U.N. Report

NOAA
May 20, 2009

A new United Nations report, with key contributions from NOAA, found that 61 of the world's 64 large marine ecosystems - large coastal ocean waters adjacent to continents - show a significant increase in sea surface temperatures in the last 25 years, contributing to decreasing fisheries catches in some areas and increasing catches in others.

Harvests in several northern Atlantic LMEs, including the Norwegian Sea, the Faroe Plateau and the Iceland Shelf, are increasing due to the increase in zooplankton, a vital fish food, brought about by the warming waters.

However, catches are declining in several European LMEs, including the North Sea, the Celtic Biscay Shelf and the Iberian Coastal LMEs, according to the United Nations Environment Programme report, *The UNEP Large Marine Ecosystem Report: a Perspective on Changing Conditions in LMEs of the World's Regional Seas*.

"The large majority of these ecosystems are shared by two or more countries, underscoring the need for regional cooperation to advance sustainable management," said Dr. Kenneth Sherman, director of the [NOAA Large Marine Ecosystem program](#). "The added stress of increasing sea surface temperatures makes it that much more important that nations cooperate to sustainably manage large marine ecosystems, the areas where most marine fisheries are produced and caught."

According to the report, 70 percent of global fish stocks within LMEs are overexploited, reducing the availability of fish for food, which is especially critical in LMEs off the coasts of Africa, Asia and Latin America, where fish is a major protein source. This contrasts starkly with the trend in the U.S. where only approximately 23 percent of domestically managed stocks are overfished, according to the most recent status of domestic stocks report. The U.S. federal law requiring the elimination of overfishing on all domestic stocks by 2010 is helping the U.S. rebuild depleted stocks to sustainable levels.

The U.N. report also said that an unprecedented volume of nitrogen effluent running into coastal waters is causing a greater frequency and extent of harmful algal blooms, oxygen depletion events and dead zones. During the algal blooms, small plankton consume excessive amounts of available dissolved oxygen, sink to the bottom and deprive fish and shellfish of the oxygen they need to survive.

"The effort to reverse the degraded status of LMEs will take time, well-focused and creative policies, and funding," said Achim Steiner, U.N. under-secretary general and executive director of UNEP, the agency that released the report.

The report documents the most rapid sea surface temperature increase in the northeast Atlantic and Mediterranean (Baltic Sea, North Sea and Black Sea LMEs), in the northwest Pacific off east Asia (East China Sea, and Sea of Japan/East Sea LMEs), and in the northwest Atlantic (Newfoundland Labrador Shelf LME).

The notable exceptions to the warming are in the California Current LME and Humboldt Current LME (off the coasts of Chile and Peru). Both are in large and persistent upwelling areas of nutrient-rich cool water in the eastern Pacific Ocean. The Arctic Ocean LME was not included in this analysis because it is almost always covered by ice.

The report is available [online](#).

To read about specific large marine ecosystems in the report go to the [Large Marine Ecosystems](#) Web site. 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.

www.noaanews.noaa.gov

[back to top](#)

6. Climate change odds much worse than thought

New analysis shows warming could be double previous estimates

By David Chandler,
Massachusetts Institute of Technology(MIT)
May 19, 2009

The most comprehensive modeling yet carried out on the likelihood of how much hotter the Earth's climate will get in this century shows that without rapid and massive action, the problem will be about twice as severe as previously estimated six years ago - and could be even worse than that.

The study uses the MIT Integrated Global Systems Model, a detailed computer simulation of global economic activity and climate processes that has been developed and refined by the Joint Program on the Science and Policy of Global Change since the early 1990s.

The new research involved 400 runs of the model with each run using slight variations in input parameters, selected so that each run has about an equal probability of being correct based on present observations and knowledge. Other research groups have estimated the probabilities of various outcomes, based on variations in the physical response of the climate system itself. But the MIT model is the only one that interactively includes detailed treatment of possible changes in human activities as well - such as the degree of economic growth, with its associated energy use, in different countries.

Study co-author Ronald Prinn, the co-director of the Joint Program and director of MIT's Center for Global Change Science, says that, regarding global warming, it is important "to base our opinions and policies on the peer-reviewed science," he says. And in the peer-reviewed literature, the MIT model, unlike any other, looks in great detail at the effects of economic activity coupled with the effects of atmospheric, oceanic and biological systems. "In that sense, our work is unique," he says.

The new projections, published this month in the American Meteorological Society's Journal of Climate, indicate a median probability of surface warming of 5.2 degrees Celsius by 2100, with a 90% probability range of 3.5 to 7.4 degrees. This can be compared to a median projected increase in the 2003 study of just 2.4 degrees. The difference is caused by several factors rather than any single big change. Among these are improved economic modeling and newer economic data showing less chance of low emissions than had been projected in the earlier scenarios. Other changes include accounting for the past masking of underlying warming by the cooling induced by 20th century volcanoes, and for emissions of soot, which can add to the warming effect. In addition, measurements of deep ocean temperature rises, which enable estimates of how fast heat and carbon dioxide are removed from the atmosphere and transferred to the ocean depths, imply lower transfer rates than previously estimated.

Prinn says these and a variety of other changes based on new measurements and new analyses changed the odds on what could be expected in this century in the "no policy" scenarios - that is, where there are no policies in place that specifically induce reductions in greenhouse gas emissions. Overall, the changes "unfortunately largely summed up all in the same direction," he says. "Overall, they stacked up so they caused more projected global warming."

While the outcomes in the "no policy" projections now look much worse than before, there is less change from previous work in the projected outcomes if strong policies are put in place now to drastically curb greenhouse gas emissions. Without action, "there is significantly more risk than we previously estimated," Prinn says. "This increases the urgency for significant policy action."

To illustrate the range of probabilities revealed by the 400 simulations, Prinn and the team produced a "roulette wheel" that reflects the latest relative odds of various levels of temperature rise. The wheel provides a very graphic representation of just how serious the potential climate impacts are. "There's no way the world can or should take these risks," Prinn says. And the odds indicated by this

modeling may actually understate the problem, because the model does not fully incorporate other positive feedbacks that can occur, for example, if increased temperatures caused a large-scale melting of permafrost in arctic regions and subsequent release of large quantities of methane, a very potent greenhouse gas. Including that feedback "is just going to make it worse," Prinn says.

The lead author of the paper describing the new projections is Andrei Sokolov, research scientist in the Joint Program. Other authors, besides Sokolov and Prinn, include Peter H. Stone, Chris E. Forest, Sergey Paltsev, Adam Schlosser, Stephanie Dutkiewicz, John Reilly, Marcus Sarofim, Chien Wang and Henry D. Jacoby, all of the MIT Joint Program on the Science and Policy of Global Change, as well as Mort Webster of MIT's Engineering Systems Division and D. Kicklighter, B. Felzer and J. Melillo of the Marine Biological Laboratory at Woods Hole.

Prinn stresses that the computer models are built to match the known conditions, processes and past history of the relevant human and natural systems, and the researchers are therefore dependent on the accuracy of this current knowledge. Beyond this, "we do the research, and let the results fall where they may," he says. Since there are so many uncertainties, especially with regard to what human beings will choose to do and how large the climate response will be, "we don't pretend we can do it accurately. Instead, we do these 400 runs and look at the spread of the odds."

Because vehicles last for years, and buildings and powerplants last for decades, it is essential to start making major changes through adoption of significant national and international policies as soon as possible, Prinn says. "The least-cost option to lower the risk is to start now and steadily transform the global energy system over the coming decades to low or zero greenhouse gas-emitting technologies." This work was supported in part by grants from the Office of Science of the U.S. Dept. of Energy, and by the industrial and foundation sponsors of the MIT Joint Program on the Science and Policy of Global Change.

web.mit.edu

[back to top](#)

7. Health effects of climate change will affect billions: report

CBC News

May 14, 2009

Climate change is the biggest global health threat of the 21st century because it could change patterns of mosquito-borne diseases, exacerbate food and water scarcities and threaten shelter, according to a new report released on Thursday.

The 40-page report, titled *Managing the Health Effects of Climate Change*, was released jointly by the Lancet and University College London. Researchers focused on the global health implications of climate change on six areas:

- Patterns of disease and mortality, such as the spread of mosquitoes carrying malaria to warmer high altitudes.
- Food security, such as declining crop yields that could lead to greater food insecurity worldwide, where one billion people currently have deficient diets.
- Water shortages that will lead to more gastroenteritis from poor sanitation and malnutrition.
- Shortage of housing in cities and human settlements.
- Extreme climatic events such as flash flooding that will overwhelm sewage systems.
- Population migration.

"The inequity of climate change - with the rich causing most of the problem and the poor initially suffering most of the consequences - will prove to be a source of historical shame to our generation if nothing is done to address it," the authors wrote.

The researchers looked at how the Intergovernmental Panel on Climate Change projections of an average global temperature rise of two to six degrees above pre-industrial average temperatures would result in more heat waves, such as one in 2003 that caused up to 70,000 deaths in Europe.

The medium-risk scenarios predict a rise of four to five degrees in northern Canada, Greenland and Siberia. "There are major health benefits from low-carbon lifestyles, which can reduce obesity, heart and lung disease, diabetes and stress," said lead author Prof. Anthony Costello of University College London's Institute for Global Health.

Costello called on health-care professionals to emphasize the threat greenhouse gas emissions and deforestation pose to future generations.

The loss of healthy years of life is predicted to be 500 times higher in Africa than in Europe, he said, urging that the inequity in health systems be addressed and poverty reduction take precedence in the debate on adapting human settlements.

Developing new crops to withstand higher temperatures is a major technological challenge, the report's authors said.

Even rich countries may not handle extreme weather events well, they said, noting that many people were trapped in New Orleans during Hurricane Katrina in 2005 because it hit at the end of a pay period, when workers lacked bus fare.

The commission that produced the report plans to hold a summit in two years to assess progress on its recommendations, such as reducing carbon emissions, increasing carbon biosequestration and equalizing the world's health systems.

[Click here](#) to download pdf of report.
www.cbc.ca

[back to top](#)

8. Development goals all at sea

By Dr Simon Boxall,
National Oceanography Centre, UK
May 15, 2009

As ministers from 121 countries converge on Manado, Indonesia this week for the World Oceans Conference, oceanographer Simon Boxall explains why climate change and warming seas bode ill for us all.

For those of us who live near the coast, the oceans have a clear and direct impact on our everyday lives; storms, varying sea levels, fishing and recreation.

However, if we live inland, what possible influence can the oceans have on us?

For those of us who live in the developed world climate change is our problem, our fault, and we have to act now to prevent the situation from worsening.

A sceptic would argue that climate change is not the problem of the developing world.

If only life on our planet was that simple.

The oceans cover more than 70 per cent of the Earth's surface and not only determine our climate wherever we live, they are also a source of food (they could fulfil the world's protein needs if managed properly), a major means of transport (95 per cent by weight of all goods are transported by sea), and they provide 60 per cent of the oxygen we breathe.

In an ironic twist, the oceans also contain the majority of the oil and gas reserves that create carbon dioxide, one of the key greenhouse gases, and are the major sinks of the very same gas - through absorption by the microscopic plants of the sea as well as the water itself.

Our planet's climate is warming up - an estimated 4°C by 2100, and there is no doubt now that humans burning fossil fuels like coal, gas, oil significantly contributes to this.

These are facts confirmed by the Intergovernmental Panel on Climate Change (IPCC), a group of 4,000 expert scientists from over 130 countries. The IPCC has no political allegiances, nothing to gain by good or bad news, just well researched science.

Barometer of change

The ocean is the barometer of climate change, particularly in the polar sea regions.

The sea absorbs most of the heat that enters the earth's system and acts like a huge storage system.

As the planet warms up we see the changes in the oceans first, and they are warming. The temperature of the world's oceans has risen by 0.25°C in the past 30 years.

That does not sound much, but in total energy terms it is huge.

We are already seeing rapid loss of sea ice - September of both 2007 and 2008 witnessed the lowest ice cover in the Arctic Sea in human history, with many areas seeing little or no ice reforming during the 2008/9 winter.

Does this mean that sea levels will start rising rapidly?

Well, they will rise by about one metre during this century - it does not matter where you live, the rise will be everywhere - but this is not because of ice melt.

Firstly, seas rise because land ice or glaciers melt and add water to the ocean basins, and, secondly, liquids - or the seas - expand when you heat them up.

The Arctic ice cap is already floating and so, contrary to popular belief, will not add to sea level as it melts.

Think about ice in a glass of water.

Coastal defence

Rising sea levels will flood many coastal areas.

Developed countries can, in theory, mitigate this; they have money, technology and organisations with responsibility for coastal defence in place.

I say "in theory" as one only has to look at the impact of Hurricane Katrina in New Orleans to realise it is not always that simple.

What about the developing world? In some regions the coastal areas can be defended, in many they cannot, and in numerous developing nations the populations are focused around the coastal areas.

Katrina also highlighted a second issue related to warming seas; storms, hurricanes - or typhoons - and monsoons all get their energy from the oceans.

As the oceans get warmer, they provide more energy to these systems, and warmer seas evaporate more quickly, leading to more rainfall.

There have been a number of studies which show an increase in hurricane intensity and frequency over recent years, and the IPCC 2007 report predicts more intense monsoon events are likely.

The effects of rising sea levels, increased storms and periods of extreme rainfall all lead to coastal flooding and damage, with many of the rich and fertile deltas of Asia and Africa being severely affected.

In addition, the interceding dry seasons will be longer and hotter. So the future will be heavy floods for part of the year and drought the rest of the year. This is not just a prediction - it is already happening on an increasingly regular basis.

Changes in climate will also bring about changes in life in the ocean.

Species sensitive to temperature are already migrating north or south in search of cooler waters.

Rising sea levels are squeezing many of the intertidal habitats like mangroves - a natural defence against storms - out of existence, to say nothing of small, low island habitats.

It is not just humans who will be looking to relocate from the Maldives over the forthcoming years.

However, human migration from flooded lands is likely to increase in many regions of the world.

The increase in temperature is also increasing the acidity of the ocean, albeit by a small amount, but enough to bleach and damage coral habitats.

Dire outlook

The outlook is not good, particularly for a developing world which is just finding its feet.

In 2006 Nicholas Stern, a globally respected economist, published a key report which offered two paths; we either spend about two per cent of the global GDP now to halt, or at least slow, climate change or we spend 20 per cent in the future to mitigate it.

The developed world, primarily the US and Europe, have been the problem thus far and need to reduce carbon emissions rapidly.

To be fair to both, development in the 20th century took place in ignorance of the damage being done.

Europe, Japan and others are on board with change and so now, under a new administration, is the US.

The forthcoming UN climate conference in Copenhagen in December will be critical, but not just because of changes in the US - which currently accounts for about 30 per cent of the carbon - but because of the developing world.

China has the largest population today, and by 2060 India will overtake it. Between them, they will account for over half of the world's population. Both countries are also developing - rapidly.

Exports are soaring and the local populations are demanding the trappings of a so-called developed nation - cars, television and air conditioning - all power hungry items.

If that power comes from fossil fuels, then what today's developed countries do will make little difference.

We need to work globally: supporting each other in using the best of technology and the most innovative ways of producing that power.

It is not fair to demand that the developing world alone has to implement a new, safer approach to its power generation.

However, it has the most to gain if it adopts alternative carbon neutral energy, and the most to lose if it does not.

In the long term, there are two paths.

The golden path is for cheaper, inexhaustible energy which is generated locally with no reliance on external supplies of fuel.

A further benefit of this route will be the eventual export of a maturing energy and appliance efficient technology.

The muddied path is literally that. Extreme weather, floods and changes in habitat.

www.english.aljazeera.net

[back to top](#)

NCE Update Subscribers,

I am sure that you have noticed the NCE is using a new format for our newsletter.

We will be tweaking the design over the next few weeks and would appreciate your feedback and/or suggestions on how it is working for you.

One of the things you may appreciate with this new format, is the permission based subscription options that can be found at the bottom of this e-mail. These options will allow YOU to subscribe, unsubscribe and/or update your e-mail address on the NCE Update distribution list.

Also note that there is a new link at the top of the newsletter which links you to an online version if you ever have trouble viewing the newsletter in your mail program.

Comments or suggestions can be sent to: [NCE Update Feedback](#)

Thanks!
Northern Climate ExChange

[back to top](#)

The next Update from the Northern Climate ExChange will be sent out Wednesday, May 27, 2009