

# Northern Climate ExChange

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

NCE Update December 9, 2009

## Article Headlines:

- [1. U.S. scientists: warming Arctic not a pretty picture](#)
- [2. Inuit climate change action call](#)
- [3. Film explores changes to life in North](#)
- [4. Carbon, Oxygen In Tree Rings Can Reveal Past Climate Information](#)
- [5. Canada announces Arctic conservation study](#)
- [6. Cambridge spearheads new polar climate change study](#)
- [7. 2000s warmest decade on record: UN](#)
- [8. EPA: Greenhouse Gases Threaten Public Health and the Environment](#)
- [9. The rise of climate-change art](#)
- [10. Copenhagen: let the talks begin](#)

## Quick Links

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

## Distribution List

[Join Our Mailing List!](#)

## Announcements

### 1. 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.](#)

### 2. Yukon Coalition for Climate Change Action: 24 hr Vigil for Survival - Vigil of Hope

The **Yukon Coalition for Climate Change Action's** 24 hr Vigil for Survival -



Vigil of Hope will be held from **3:50 pm. Friday December 11 until 3:50 pm. Saturday December 12th** in front of the Elijah Smith Government Bldg. Main St. Whitehorse, Yukon.

Millions of people will gather at vigils around the world to witness, show support and hold the intention that our world leaders will apply foresight and decisive action in creating the laws and policies needed to expedite humanity's timely transition to a fossil fuel free economy and ensure a carbon-neutral (negative), climate-safe future.

Yukon citizens will be holding a 24-hour candlelight vigil outdoors in front of the Federal Government Building. We are looking for people to support/ contribute to the opening and closing ceremonies (Bells will be rung to mark the opening and close of the vigil. (at 3:50 PM on Friday and 3:50 PM on Saturday) All are welcome to attend!

[www.350.org](http://www.350.org)

### **3. Report Released - Species Feeling the Heat: Connecting Deforestation and Climate Change** - December 7

The **Wildlife Conservation Society** released a list of animals facing new impacts by climate change, some in strange and unexpected ways.

In a new report titled "**Species Feeling the Heat: Connecting Deforestation and Climate Change**," the **Wildlife Conservation Society** profiles more than a dozen animal species and groups that are facing threats due to climate change impacts including: changing land and sea temperatures; shifting rain patterns; exposure to new pathogens and disease; and increased threats of predation.

The report comes out just as leaders from around the world gather in Copenhagen to address climate change issues. It also coincides with the 2010 launch of the **International Year of Biodiversity** by the United Nations, an effort to raise awareness to reduce the constant loss of biological diversity worldwide. The **Convention on Biodiversity**, which emerged from the 1992 Rio Earth Summit, recently admitted that none of its 2010 biodiversity targets have been met, underscoring the dire situation that wildlife around the world face from climate change and other threats.

[Download Report](#) (note: if file downloads with .ashx extension, change it to .pdf to view it with adobe reader)

[www.wcs.org](http://www.wcs.org)

### **4. Joint letter issued by five Canadian Professional Scientific Societies**

**Canadian Meteorological and Oceanographic Society (CMOS), Canadian Geophysical Union (CGU), Canadian Association of Physicists (CAP), Canadian Society of Soil Science (CSSS) and Canadian Society of Zoologists (CSZ)**, issued a joint open letter on November 26th, urging the Canadian Government to negotiate an outcome that will rapidly and adequately address climate change at the Copenhagen Conference of the Parties to the UN Framework Convention on Climate Change.

[Download letter](#)

[www.cmos.ca](http://www.cmos.ca)

## **5. 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.

[www.globalclimatecampaign.org](http://www.globalclimatecampaign.org)

## **6. New Met Office Map: The impacts of a global temperature rise of 2 °C - December 7**

"A new map has been launched that highlights the importance of limiting mean global temperature rise to no more than 2 °C above those prior to the industrial revolution.

The Met Office map - The impacts of a global temperature rise of 2 °C - has been produced to complement a similar map, published in October by the UK Government and the Met Office, exploring the impacts on a world if the mean temperature was allowed to climb to 4 °C above the pre-industrial climate average.

The two maps together show the range of climate impacts that can be avoided if we act now to reduce global emissions to keep global temperatures below 2 °C."

[The impact of a global temperature rise of 2 °C](#) (PDF, 1.4 MB)

[The impact of a global temperature rise of 4 °C](#) (PDF, 1.6 MB)

[www.metoffice.gov.uk](http://www.metoffice.gov.uk)

## **Articles**

### **1. U.S. scientists: warming Arctic not a pretty picture**

*Experts at Copenhagen say Arctic warming may be irreversible*

By Jane George  
Nunatsiaq News  
December 7, 2009

COPENHAGEN - As sea ice on the Arctic Ocean thins and shrinks, Greenland's ice sheet melts and seas turn acid, water temperatures will go up, sea levels rise, and marine life die, U.S scientists attending the COP15 gathering in Copenhagen said this week.

The Arctic's overall temperature has already risen by 3 C - much more than the half of a degree rise experienced globally.

That's the un-pretty picture painted by the scientists from the United States, who shared their most recent information about the Arctic's melting ice at the United Nations climate change meeting in Copenhagen.

The ice melt has gone so far that turning back to Arctic's cold environment of the past may be "very hard," the scientists said at the event, called "The Arctic: one of the earth's most rapidly warming regions."

The scientists didn't want to use the word "tipping point" to describe this situation of no return for the planet.

But they said it would be impossible to turn around the warming processes that could leave the Arctic with no summer sea ice by 2050 at the latest, and with an ocean incapable of sustaining any marine life, from clams to whales.

As the scientists spoke to a sparse audience in the U.S. government's meeting room on the opening morning of the climate change conference, an overflow crowd watched Dr. Rajendra Pachauri, chairman of the United Nations's Intergovernmental Panel on Climate Change, defend the science in the IPCC's fourth assessment report in 2007, which also warned of disappearing ice.

To keep climate change in check, Denmark's environment minister, Connie Hedegaard, urged the 15,000 delegates at the UN climate change to compromise, agree, come up with concrete solutions and "mark this meeting in history."

"For the next two weeks, Copenhagen will be Hopenhagen," Danish Prime Minister Lars Lokke Rasmussen said. "At the end of the next two weeks we must deliver on the hopes that the world has placed with us. Be ambitious, creative and visionary. A deal is within reach."

But this deal may be too little too late to change the meltdown of the Arctic, said Dr. John Overland, who is the lead author of a new study on snow, water, ice and permafrost in the Arctic.

Overland said he's shocked and surprised at the extent of the melting and thinning of Arctic sea ice. Its reduced volume, which is about 25 per cent of what it once was, has outstripped even the most pessimistic scientific predictions, he said.

The Arctic has "reached a place where it's very difficult to go back to the previous condition," Overland said, although the process could be slowed down by action to limit climate-warming greenhouse gasses.

The continuing loss of sea ice cover loss wasn't as profound in 2009 as in 2008, Overland said, but this year's sea ice re-formed later in the autumn.

That finding wouldn't surprise Jupi Angootealuk and his uncle, Jimmy Nakoolak of Coral Harbour whose mid-November polar bear hunting trip ended in a near-disaster when the ice they were on broke up.

Overland said he flew north of Alaska recently and saw no ice, only empty water, at a time of year when ice should be forming.

The reason? Every year when there's been less ice, the open water absorbs more heat, and this has led to high water temperatures, less of the multiyear ice that used to provide stability and the creation of what Overland calls "a new reservoir of Arctic heat."

"The Arctic is really entering a new climate state and sea ice [melt] is the culprit," Overland said. But a turnaround for sea ice doesn't look favorable- even if greenhouse gas emissions go down.

The same goes for the speed-up in the melting of Greenland's ice sheet, bleakly described by Dr. Wahleed Abdalati, a scientist with the University of Colorado who has spent much of his career tracking this shrinkage with NASA satellites.

Judging from diagrams Abdalati flashed on a screen, ice from its huge ice cap appears flows out of Greenland's glaciers the way water flows out of a bathtub after the plug is pulled.

Ilulissat's glacier has lost twice as much ice in the past nine years as during the previous 100 years - and when the ice hits warmer water, it melts many times faster than before - a phenomenon Abdalati said he finds astonishing, fascinating and depressing.

Stopping this accelerating melt is problem because "the more it [melting] happens, the more it wants to happen," Abdalati said.

"We're in a new place and the world's ice is rapidly decreasing," a place where "we can count on rising seas," Abdalati said, showing a map of what the world will look like after sea levels rise by one metre.

If that sounds bad, the acidification of Arctic Ocean sounds even worse because it's happening now.

The surface waters of Arctic Ocean, the "most vulnerable ocean in the world," are already corrosively acidic during the ice-free season, said Dr. Richard Feely, an oceanographer with the Pacific Marine Environmental Laboratory.

That's also due to ice melting. The melting ice and reduced cover leads to changes in the chemical balance of the ocean's water and makes it more acidic, so it eats away at the shells of clam and other tiny marine life.

As the Arctic sea ice cover continues to decrease, the seawater will become more corrosive, rippling through the food chain, making it hard for fish to find food or for whales to navigate by sound.

The acidification of the Arctic Ocean will "very very difficult" to turn around, Feely said - and it's likely to affect all the world's oceans by 2020, he said.

To better understand the decline of ice in the Arctic, scientists say they are ramping up their research and monitoring.

On Dec. 14, they'll release the first part of a study on snow, water, ice and permafrost in the Arctic, a project of the Arctic Council.

[www.nunatsiaqonline.ca](http://www.nunatsiaqonline.ca)

[back to top](#)

## **2. Inuit climate change action call**

*Delegations from 192 countries are arriving in Copenhagen for two weeks of talks aimed at establishing a new global treaty on climate change.*

By Gilly Mathieson  
BBC Scotland Politics Show  
December 6, 2009

Among those attending are the Canadian Inuit, who have called for tough new emissions targets and extra funding to help adapt to global warming.

Over the last 300 years, most of the young men that came to the Canadian Arctic were from Scotland. They worked as fur traders for the Hudson's Bay Company, the oldest trading business in the world.

Canada's National Inuit leader, Mary Simon, represents a community which lives in the country's 53 Arctic communities.

During her childhood, Ms Simon and her family hunted for food, travelled by dog team and lived in igloos. It was part of a traditional lifestyle the Inuit say is now in danger as they struggle to cope with climate change.

She said: "In my region this winter it's three degrees - usually it's minus 25 or minus 30. It got very cold in September. The ice froze to a level where people could go hunting and fishing."

Then, said Ms Simon, the area became warm and it rained.

She went on: "Permafrost is melting, which is having an affect on the houses that people live in. Some of our buildings are starting to sink.

"We hunt and fish and gather during all four seasons and this is being impacted on by global climate change

as well.

"Contaminants in the food chain have been very high and that has a very bad impact on people because they depend on that food for their protein."

Ms Simon, who has been visiting Scotland as a guest of Edinburgh University's centre of Canadian studies, said: "We can't go to the grocery store and buy a pound of beef or a whole chicken, it doesn't exist in a lot of our communities, so people have to go out and hunt for their food, the very protein that makes you health become unhealthy."

She will soon be heading to Copenhagen to push for tough new emissions targets and an adaptation fund to help the Inuit deal with climate change.

"Things have to change," said Ms Simon, adding: "There has to be concrete, hard decisions made by world leaders."

"This is about human kind and the effort that is needed by all countries to make hard choices and hard decision. I've called for an adaptation fund, that would include regions within developed nations and I'm calling on a twenty billion dollar fund initially that would increase over five years. We need resources to do all kinds of things including fixing our houses and fixing our buildings."

The Inuit leader said the Scottish government had already set the standard for the Copenhagen climate change talks with its legislation for a 42% cut in emissions by 2020.

[www.news.bbc.co.uk](http://www.news.bbc.co.uk)

[back to top](#)

### **3. Film explores changes to life in North**

Winnipeg Free Press  
December 4, 2009

A group of elders pulls the seal skins taut over the wooden frame, carefully binding the pelts together as they construct a traditional kayak on the shoreline of one of Canada's most northern communities. The gathering in Cambridge Bay, Nunavut, sing and eat as they talk about changes they've witnessed over the last several decades that have warmed their distant region and altered their native food sources.

The conversation is the focus of one of two Canadian documentaries being presented this week in Copenhagen, along with other videos showcasing the effects of climate change on indigenous populations around the globe.

Pamela Anne Hakongak Gross, a 24-year-old student from Cambridge Bay, spent weeks making the kayak video and hopes it will open people's eyes to the dramatic and subtle changes brought on by a warming world.

"I think people should understand that it really is happening and it's happening in the North more drastically," she said Thursday from outside Copenhagen, where world leaders meet next week to hammer out the framework of a proposed Kyoto 2 treaty.

The 15-minute video, called Building A Qataq To The Future, features interviews with Inuit elders who discuss how meat is becoming scarce as traditional food sources, such as caribou, migrate in search of cooler temperatures.

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

[back to top](#)

#### **4. Carbon, Oxygen In Tree Rings Can Reveal Past Climate Information**

*Isotope analysis provides accurate information*

redOrbit

December 4, 2009

The analysis of carbon and oxygen isotopes embedded in tree rings may shed new light on past climate events in the Mackenzie Delta region of northern Canada.

Scientists have long looked at the width of tree rings to estimate temperature levels of past years. Larger rings indicate more tree growth in a season, which translates into warmer summer temperatures. But the analysis of carbon and oxygen isotopes in tree rings can also provide accurate data on past climate events, say researchers working in northern Canada.

In a paper published in the most recent issue of the journal of Arctic, Antarctic and Alpine Research, Trevor Porter, a PhD student in Geography and Environmental Science at Carleton University, and three other authors compared temperature data collected in Inuvik, Northwest Territories (NT) since 1957 with their own analysis of isotopes found in white spruce trees in the Mackenzie Delta region of the NT. They found a strong correlation between the two data sets and temperatures.

"Isotope analysis is a good way to measure past climate change," says Porter about the results.

Isotope analysis is not a new way to measure past air temperatures. However, the method has not been widely used because lab costs have been prohibitive, especially when compared with the examination of tree ring width. Now, however, the cost of equipment has dropped substantially making it more affordable for researchers to use this method.

Porter's work was carried out on the northern edge of the boreal forest in the NT where trees are small but surprisingly old. "A 15 to 20 cm. tree could be a 300 to 400 year old tree," says Porter.

This slow rate of growth actually helps researchers because smaller trees stay standing longer. Trees that fall begin to decay making data analysis difficult or impossible.

"Once they get too large, it's difficult for trees to persist. They are susceptible to wind and ice storms. One of the reasons trees (in the North) persist so long is because they don't grow as much," says Porter.

Isotope analysis allows researchers to conduct their work using a smaller sample size than needed when trying to re-construct temperature records using tree ring width. Porter explains that the width of rings can vary considerably between trees even when they are growing in the same stand. This variation can complicate reconstructions of past climate.

A number of factors influence ring size, including the age of the tree and the location of the tree within the forest. Older trees tend to have smaller rings than younger trees. And trees within the same area might not all receive the same amount of light, nutrients or even water.

"Growth is controlled by many things . . . they (trees) can all end up just a little bit different," says Porter. Isotope signals, on the other hand, are often very similar between trees. This means researchers can gather accurate data from three or four trees instead of the 20 they might need for tree ring width analysis.

"In ring widths there will be more variability between trees. There will be similar trends, but you have larger differences that you would find between the isotopes of different trees," says Porter.

Porter is hoping his work will lay the foundation for a model that can be used to investigate the long-term climate history of the Mackenzie Delta region. Although the temperature record for Inuvik only dates back to 1957, the dead and live tree ring record stretches to nearly 1000 years before present. That prospect excites the young researcher.

"The tree ring record goes back almost a thousand years in this area, but it's never been used for a temperature reconstruction. This is a really exciting time to work in climate research, especially for a young student," he says adding, "This is a hot topic."

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

[back to top](#)

## **5. Canada announces Arctic conservation study**

AFP

*Yahoo News*

December 8, 2009

OTTAWA (AFP) - Canada's environment minister on Tuesday announced a five-million-dollar (4.7 million US) feasibility study for the creation of an Arctic marine conservation area at mouth of the famed Northwest Passage.

"As global climate change continues and traffic through the Northwest Passage is expected to increase, our government is committed to safeguarding Canada's Arctic and protecting its most special natural features," said Environment Minister Jim Prentice.

"This project will allow us to significantly advance our knowledge as well as our protection and conservation activities in this area," he said.

Lancaster Sound, at the eastern entrance of the famed Northwest Passage, is flanked by "dramatic cliffs and spectacular fjords," according to Parks Canada.

During the summer months most of the world's narwhal, a third of North America's belugas, a large number of bowhead whales, ringed seals, harp seals and walrus are found in these waters.

It is also home to one of the highest densities of polar bears in the world and is a breeding ground for about one-third of Eastern Canada's colonial seabirds, including several hundred thousand pairs of thick-billed murre, black-legged kittiwakes and northern fulmars.

[www.news.yahoo.com](http://www.news.yahoo.com)

[back to top](#)

## **6. Cambridge spearheads new polar climate change study**

Business Weekly - UK

December 2, 2009

British Antarctic Survey, based in Cambridge, is spearheading a new global initiative designed to better understand climate change. BAS is steering the effort under its new science strategy - Polar Science for Planet Earth. Both polar regions will be embraced in the study.

The new science strategy builds on BAS scientific and operational achievements over the last 60 years, addressing the themes of the science strategy of NERC (the Natural Environment Research Council), of which BAS is part.

A new additional focus on the Arctic will maximise BAS knowledge and expertise to nurture new partnerships and collaborations that will enhance scientific understanding of both polar regions and provide the scientific evidence essential for understanding global environmental change.

Lord Drayson, Minister for Science and Innovation said the initiative was a massive coup for the UK: "We're a world leader in polar science. The British Antarctic Survey's discovery of the hole in the ozone layer changed international policy and resulted in vital production limits on harmful chemicals. This new strategy will help us to conduct the science essential to understanding and addressing climate change."

In February, the governments of UK and Canada signed an agreement that enables sharing of facilities and

other operational resources and development of collaborative programmes in both the BAS sphere of operations in Antarctica and in the Canadian Arctic.

The arrangement encourages collaborative work between leading NERC-funded researchers and their Canadian counterparts.

The key research centre in this particular agreement is British Antarctic Survey, which operates and manages all the aircraft, ships and polar field stations that have been offered as the central UK contribution to the negotiated agreement.

The UK is not an Arctic Rim state, has no territories in the region and its only High Arctic research facility is at Ny Alesund on Svalbard. Canada is a signatory to the Antarctic Treaty but has no Antarctic research facility.

Professor Nicholas Owens, director of BAS said: "BAS recognises the urgency for continued investigations into the regional and global consequences of disappearing ice and melting permafrost.

"There is a critical need for greater inter-disciplinary within our research programme and continued national and international cooperation within the polar scientific community.

"Polar Science for Planet Earth will provide the framework to achieve this. By working with the NERC Arctic Office and through a collaboration with our Canadian and European counterparts BAS will use its considerable knowledge base, position within the international scientific community and operational expertise to enhance UK research effort in the Arctic and provide an integrated and co-ordinated approach to science at both poles."

British Antarctic Survey delivers world-leading inter-disciplinary research in the Polar Regions.

Its science and support staff in Cambridge, Antarctica and the Arctic, work together to deliver research that underpins a productive economy and contributes to a sustainable world.

Its numerous national and international collaborations, leadership role in Antarctic affairs and excellent infrastructure help ensure that the UK maintains a world-leading position.

BAS has over 450 staff and operates five research stations, two Royal research ships and five aircraft in and around Antarctica.

[www.businessweekly.co.uk](http://www.businessweekly.co.uk)

[back to top](#)

## **7. 2000s warmest decade on record: UN**

CBC News  
December 8, 2009

The head of the World Meteorological Organization, a United Nations weather agency, said Tuesday that this decade will "very likely" turn out to be the warmest on record going back to 1850.

Michel Jarraud, the WMO's secretary general, added that 2009 will likely be about the fifth-warmest year on record.

The agency said parts of China experienced their warmest year on record, and Australia, so far, is on track to record its third warmest year.

Only the United States and Canada experienced conditions that were cooler than average, the agency said.

The WMO also said the Arctic sea ice's extent during the melt season ranked the third lowest, after the lowest and second-lowest records set in 2007 and 2008, respectively.

The agency released its findings on the second day of the Copenhagen climate conference.

Delegates at the 192-nation conference, which opened Monday, are trying to reach a new agreement on controlling greenhouse gas emissions.

[www.cbc.ca](http://www.cbc.ca)

[back to top](#)

## **8. EPA: Greenhouse Gases Threaten Public Health and the Environment**

*Science overwhelmingly shows greenhouse gas concentrations at unprecedented levels due to human activity*

U.S. Environmental Protection Agency (EPA)  
December 7, 2009

WASHINGTON - After a thorough examination of the scientific evidence and careful consideration of public comments, the U.S. Environmental Protection Agency (EPA) announced today that greenhouse gases (GHGs) threaten the public health and welfare of the American people. EPA also finds that GHG emissions from on-road vehicles contribute to that threat.

GHGs are the primary driver of climate change, which can lead to hotter, longer heat waves that threaten the health of the sick, poor or elderly; increases in ground-level ozone pollution linked to asthma and other respiratory illnesses; as well as other threats to the health and welfare of Americans.

"These long-overdue findings cement 2009's place in history as the year when the United States Government began addressing the challenge of greenhouse-gas pollution and seizing the opportunity of clean-energy reform," said EPA Administrator Lisa P. Jackson. "Business leaders, security experts, government officials, concerned citizens and the United States Supreme Court have called for enduring, pragmatic solutions to reduce the greenhouse gas pollution that is causing climate change. This continues our work towards clean energy reform that will cut GHGs and reduce the dependence on foreign oil that threatens our national security and our economy."

EPA's final findings respond to the 2007 U.S. Supreme Court decision that GHGs fit within the Clean Air Act definition of air pollutants. The findings do not in and of themselves impose any emission reduction requirements but rather allow EPA to finalize the GHG standards proposed earlier this year for new light-duty vehicles as part of the joint rulemaking with the Department of Transportation.

On-road vehicles contribute more than 23 percent of total U.S. GHG emissions. EPA's proposed GHG standards for light-duty vehicles, a subset of on-road vehicles, would reduce GHG emissions by nearly 950 million metric tons and conserve 1.8 billion barrels of oil over the lifetime of model year 2012-2016 vehicles.

EPA's endangerment finding covers emissions of six key greenhouse gases - carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulfur hexafluoride - that have been the subject of scrutiny and intense analysis for decades by scientists in the United States and around the world.

Scientific consensus shows that as a result of human activities, GHG concentrations in the atmosphere are at record high levels and data shows that the Earth has been warming over the past 100 years, with the steepest increase in warming in recent decades. The evidence of human-induced climate change goes beyond observed increases in average surface temperatures; it includes melting ice in the Arctic, melting glaciers around the world, increasing ocean temperatures, rising sea levels, acidification of the oceans due to excess carbon dioxide, changing precipitation patterns, and changing patterns of ecosystems and wildlife.

President Obama and Administrator Jackson have publicly stated that they support a legislative solution to the problem of climate change and Congress' efforts to pass comprehensive climate legislation. However, climate change is threatening public health and welfare, and it is critical that EPA fulfill its obligation to respond to the 2007 U.S. Supreme Court ruling that determined that greenhouse gases fit within the Clean

Air Act definition of air pollutants.

EPA issued the proposed findings in April 2009 and held a 60-day public comment period. The agency received more than 380,000 comments, which were carefully reviewed and considered during the development of the final findings.

Information on EPA's findings: [www.epa.gov](http://www.epa.gov)

[www.yosemite.epa.gov](http://www.yosemite.epa.gov)

[back to top](#)

## **9. The rise of climate-change art**

*Artists are waking up to climate change. But what good can they do - and how green is their work?*

*Cornelia Parker, Gary Hume and Keith Tyson reveal how they're dealing with the threat of catastrophe*

By Madeleine Bunting

The Guardian

December 2, 2009

A floating plastic bubble, so hi-tech it is lighter than air, is attached by ropes to the walls of the National Gallery of Denmark in Copenhagen. As I step gingerly on to its see-through floor, I can peer down at the gallery 100ft below. When I'm joined by one of the museum staff, I become unsteady. We crawl around this airborne plastic yurt like babies and then, feeling giddy, stop to sit and talk about how our children might end up living in a city of such bubbles, sealed off from a contaminated earth; about who might be lucky enough to have such a refuge; how they might sing their children lullabies of a lost earth. It's an eerie conversation to have with a stranger, both of us imagining a deeply tragic future that seems highly plausible.

This installation, by Argentinian architect-artist Tomás Saraceno, is the biggest in Rethink, a series of contemporary art exhibitions taking place across Copenhagen ahead of next week's [climate change summit](#).

When I tell Saraceno of my experience in his bubble, he is delighted. "Perfect," he laughs. This, he says, is the role art has to play in tackling climate change. "Art is about trying to rethink the things you take for granted."

Saraceno is one of several artists appearing at Copenhagen and in the Royal Academy's Earth show, which opens in London this week. Some activists have wondered why the art world has been slow to grasp the significance of climate change, so you could argue that these exhibitions represent a dramatic awakening.

Curators on both sides of the North sea say the response from artists has been so enthusiastic that they could have filled their spaces twice over. And both report unusually enthusiastic support from governments: the Department of Energy and Climate Change has paid for a free guide for every visitor to Earth. It's as if politicians, recognising the limits of their ability to engage the public on this issue, are turning in desperation to other means of communicating the enormity of what is at stake. "I didn't want penguins or icebergs," says Kathleen Soriano, one of Earth's curators. "There's nothing literal. We're not offering information - if visitors want that, we have a website. We wanted people to have an aesthetic response."

That emphasis is evident, but with the beauty comes a sinister undertow. In Copenhagen, Acid Rain, by Bright Ugochukwu Eke, consists of 6,000 hanging plastic bags. They sparkle, grey, clear and black, like Christmas decorations, but they contain carbon dust - currently choking the inhabitants of the delta region of Nigeria, an area of massive oil exploration. At first glance, the work of the Chinese artist Yao Lu appears to be an idealized landscape of mountains and clouds, but look more closely and you'll see that it's an urban waste dump.

### **A chilling lecture at Cern**

Gary Hume's work, The Industrialist, is a lead tracing of a factory chimney billowing smoke. He calls it an epitaph for industrialists, but admits he finds the brief a challenge. "How do you depict global catastrophe?"

he says. "I'm too selfish to describe the world's dilemma, so I describe my own paltry dilemma of what it's like to be alive."

Hume describes his involvement with Cape Farewell - an initiative to bring artists and scientists together, in Hume's case on a trip to the Arctic - as "completely beautiful, [but] hard to relate to my life". He recycles, grows vegetables, has made his house fuel-efficient, but acknowledges painful contradictions. "The people who do the most damage [environmentally] buy my work, and I'm not using ecologically sound paint. I feel like apologizing - I can't help the world. Climate change is too big for my art. My painting is a small thing, like a child might do." Hume talks of the possibility of millions dying, but he is wary of visual art's long-held fascination with apocalypse. Nature's indifference to human survival has left him with no grand ambitions - only a modest, if deeply uncomfortable, determination to offer "solace".

Keith Tyson echoes this notion of humility. Nature Painting, an intense work on show in Earth, was made by mixing toxic chemicals with pigment, echoing natural forms such as cell formations. "Nature has an intelligence far greater than us," Tyson says. "We talk about saving the earth, but we're really talking about saving ourselves. The earth can look after itself." Tyson attended a lecture on climate change at Cern, the European Organization for Nuclear Research and home of the Hadron Collider: "It was a scientist talking to other scientists and it was horrific - far worse than people imagine. Terrifying."

The experience clarified his sense of the artist's role. "It is not to advocate solutions. It is something much deeper and more subtle - to make us reflect and rethink what it is to be a human being in the 21st century. We don't have that much power. It's nature that creates us. That's the kind of education too subtle to put on a syllabus: that's the important role of art."

Curator Soriano was aware of these competing perspectives when she put Earth together. "I didn't want to be preachy," she says, and is nervous of any suggestion that the exhibition is the most political the Royal Academy has mounted. In fact, says Anne Sophie Witzke, Rethink's project manager, the galleries involved in Copenhagen have been cautious: no one wants to be accused of propaganda.

This timidity is a source of frustration for the arts group Platform, which for over 20 years has worked to marry art and activism. "The arts stumble along the fault line between representation and transformation," says the organization's James Marriott. "But, until 50 or so years ago, all art was about transformation and persuasion. Look at Goya: he wanted to persuade you of the horrors of war."

Art, Marriott thinks, is rediscovering a sense of purpose. In the last 50 days, Platform has curated 100 events at the Arnolfini Centre in Bristol; many of the featured artists will be joining activists in Copenhagen during the summit.

## **Huge carbon footprint**

Marriott is delighted that climate change is finally attracting the attention it needs. "The more the merrier," he says, rejecting the criticism that artists are climbing on a green bandwagon. He is scathing, however, of the continuing blindness of artists, curators and institutions to their own enormous carbon footprints. "They lug lumps of wood around the world for exhibitions. Printing a catalogue on recycled paper is pathetic tokenism - no FTSE company would get away with that." Contemporary art is an expensive, global business. Artists, curators and the works all end up flying, while galleries themselves require expensive climactic conditions. Indeed, curators in London and Copenhagen admit they have no idea of the carbon cost of their exhibitions.

Charlie Kronick is the senior climate change adviser at Greenpeace. "The real role is not about using artists to leverage our message up the agenda," he says, "but for the artist to make this agenda their own. It is important they maintain their authenticity." Campaign initiatives have made a big impact on a number of artists (Ian McEwan and Antony Gormley have spoken enthusiastically about their Cape Farewell experiences), but many, such as Cornelia Parker, feel daunted by the need to respond to something so huge.

"I try to do my bit," says Parker, "as a citizen, an artist and in my everyday life." She has cut down on flying and offsets the flights she takes. But she confesses that her piece for the Earth show, Heart of Darkness, carbon frag-ments of a forest fire, was not originally about climate change; she was thinking of Al Gore's election loss and the hanging chads scandal. Now it is being co-opted into the climate change

narrative.

Similarly, *Field*, by Gormley, takes on a new meaning here: the frightened, gormless crowds of humans spill out of their room at the Royal Academy, not knowing where to go.

Parker's work has long had a preoccupation with the apocalyptic, but it was while listening to scientists recount their struggle to communicate the scale of climate change to politicians that she realised art had a vital role to play. She describes this as "a call to arms", but isn't keen to be associated with a single issue. She says she has done only one piece of work - a filmed interview with Noam Chomsky, showing in Copenhagen - that deals with climate change, and even then the interview covers a range of issues.

"It was intentionally propagandist," she says, adding hesitantly that perhaps this is what is required. "After all, the first world war artists were recruited to help fight the war - and this is the equivalent of war."

[Earth is at the Royal Academy](#), London W1, until 31 January 2010. Details: 0207 300 8000. The Guardian is a media partner for the exhibition. Rethink runs until 5 April and will tour next year. Details are at [rethinkclimate.org](#).

[www.guardian.co.uk](http://www.guardian.co.uk)

[back to top](#)

## 10. Copenhagen: let the talks begin

*Nature's low-down on the world's biggest climate summit.*

By Jeff Tollefson

Nature doi: 10.1038/news.2009.1125

December 7, 2009

After two years of preparations, delegates from 192 countries begin the difficult task of piecing together a climate agreement in Copenhagen today. All the major industrialized nations have now put their commitments to cut carbon on the table, and the major emerging nations have outlined their voluntary targets too.

But the proposed cuts fall well short of what many had hoped, and the gulf between developed and developing nations over core issues - such as who should pay for dealing with climate change and who should be leading the way - remains as wide as ever. *Nature* takes a closer look at the key issues that will play out over the coming two weeks.

### **Several countries, including the United States and China, have announced formal commitments in recent weeks. Have the prospects for a deal improved?**

Yes and no. US President Barack Obama removed one of the largest barriers to a deal by signalling that he will commit to reducing emissions by about 17% below 2005 levels by 2020, even though Congress has yet to enact a domestic climate policy. A second barrier came down when China said it would commit to reducing carbon intensity - how much carbon it emits per unit of gross domestic product - by at least 40% from 2005 levels by 2020. Both announcements were preceded by aggressive commitments from Brazil (at least 36% from expected levels by 2020) and South Korea (30% below projections for 2020). India came through last week with a less-than-inspiring promise to cut carbon intensity by 20-25% from 2005 levels.

These announcements are significant in that they pave the way to an agreement that quantifies emissions commitments. But they do not guarantee a deal. Developing countries have asked rich countries to reduce emissions to 40% below 1990 levels, but current commitments come in at around 13-19%. Bridging that gap won't be easy.

### **How does science affect this debate?**

Developing countries regularly invoke the Intergovernmental Panel on Climate Change's (IPCC's) 2007 assessment as evidence that rich countries aren't doing enough. The IPCC's report on mitigation options specified that industrialized countries would have reduce emissions by 25-40% by 2020 compared with 1990 levels to keep atmospheric carbon dioxide concentrations below 450 parts per million (p.p.m.) - roughly what is needed to limit the average temperature rise to 2 °C.

Carbon dioxide levels registered at 386 p.p.m. in 2008, compared with preindustrial levels of about 280 p.p.m., according to the National Oceanic and Atmospheric Administration in Washington, DC. Those levels are rising at about 2 p.p.m. per year. Most industrialized nations have signed on to the 2 °C goal, but not the major emerging economies, which fear they will have to pick up the slack if rich countries fall short.

### **Will the [e-mails leaked from the University of East Anglia](#) affect the talks?**

Probably not. But the talks operate by consensus, which means that just one country could hold things up. So far only one nation - Saudi Arabia - has weighed in on the side of the climate sceptics, with their chief negotiator citing these e-mails as evidence that scientists fudged their findings to play up the human impact.

### **Are developing countries holding up their end of the bargain?**

Experts are still analyzing the proposals, but some analyses suggest that the commitments of developing countries - driven by the major emerging economies - would fall within the range of 15-30% emissions reductions from 1990 levels by 2020.

Yet India, for one, has repeatedly said it will not sign on to binding commitments, and will only verify emissions reductions that it undertakes with money it receives from rich countries. The United States and Europe want developing countries to formally commit to these goals, and to open their books to outside inspection.

### **What are the other major hurdles to a deal in Copenhagen?**

The first is money. Developed countries will need to pay serious cash to help poor countries shift onto a sustainable development path and cope with the inevitable impacts of global warming. The United Nations' climate chief Yvo de Boer says that consensus seems to be emerging around a start-up fund of US\$10 billion, which was endorsed by Obama last week. There is also more tentative agreement that in the long-term, that figure may have to rise to \$100 billion a year. Many countries - and researchers - contend that even this sum isn't enough.

And delegates still need to figure out the architecture of the treaty. Developing countries want to preserve the 1997 Kyoto Protocol and fold the United States - which did not ratify the protocol - in through a separate agreement. Europeans want a single treaty, but the United States objects to many of the accounting and verification rules of that treaty.

Questions also remain about the role of existing multinational institutions such as the World Bank and potential new institutions that could be charged with allocating money, organizing energy research and development programmes, and helping poor countries to adopt clean-energy technologies.

### **Nearly 100 heads of state are expected to attend, including Obama. Will they secure an agreement?**

Probably. But negotiators are now aiming for only a political agreement on major issues, leaving the details of a formal treaty to be filled in next year. Such an agreement would include a deadline for filling in those gaps, perhaps as early as next spring but more likely a year from now at the next UN climate conference in Mexico City. It might also feature agreements on key issues such as short-term funding; research, development and deployment of clean-energy technologies; and on handling emissions from tropical deforestation.

UN officials are still urging developed countries to increase their commitments, but it's unlikely that their negotiating positions - particularly those of the United States - are going to change substantially. That means developing countries must decide whether they are willing to sign a deal that falls short of their

expectations, and so far they aren't backing down.

Some pragmatists argue that any agreement at Copenhagen represents an important first step. But others argue that a stronger deal might be secured by continuing negotiations for another year, rather than rashly signing a questionable deal this year.

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

[back to top](#)

NCE Update Subscribers,

For comments, or to submit content you would like considered for inclusion in the NCE Update, e-mail us at: [NCE Update](#).

Northern Climate ExChange

[back to top](#)

*The next Update from the Northern Climate ExChange will be sent out **Thursday, December 16, 2009***