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[KALW Interview Of Dan Whaley On OIF, On Earth Day, Thursday Apr 22 At 5pm](#)
20 April, 2010 by dan

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[KALW Crosscurrents](#) is doing an interview of me talking about OIF, geoengineering and the recent [Asilomar conference](#) for Earth Day. Kudos to them for being willing to take on a complex issue, particularly on a sacred day for environmentalists. Could we be getting closer to the day that those thinking about climate intervention are actually recognized to be deep environmental thinkers as well. In fact, dare I say, just as concerned (if not more in some cases) about the state of our environment as our peers.

Climate Change Science (27)

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FAQ

The show airs on KALW 91.7FM in San Francisco at 5pm Thursday April 22, and can be accessed afterwards as a podcast [here](#).

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Recent Science

[An article looks at the positive benefits of ash](#) to the nutrient cycle in the ocean... There are a few good papers on this, including Frogner, et al 2001 in Geology.

Ocean Fertilization (71)

Reference

"By now, you may know that airborne ash from the volcano that erupted through Iceland's Eyjafjallajökull glacier this past Wednesday is like floating Kryptonite for airplanes. The ash clogs engines and threatens aeronautic safety. And in the right concentrations, it can be bad for both people and [animals](#) when it lands.

Links

The falling cinders—a mix of crushed rock, glass and some toxic chemicals—are considered generally bad for the body. So what happens when this particulate cloud of doom settles on the surface of the ocean? You might picture it creating a floating blanket of poison that would give the people at [Ocean Conservancy](#) cardiacs. But does it?

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A plume of volcanic ash rises into the atmosphere from a crater under about 656 feet ice at the Eyjafjallajökull glacier in southern Iceland April 14, 2010. A huge ash cloud from the Icelandic volcano turned the skies of northern Europe into a no-fly zone on Thursday, stranding hundreds of thousands of passengers. Photo: Olafur Eggertsson/Reuters

Well, according to several scientific studies, the ash could actually be good for oceans.

[UK MPs Call For Regulation Of Geoengineering](#)

18 March, 2010 by dan

The [UK Parliament Science and Technology Committee has recommended](#) that the UN be urged to take up the regulation of solar radiation management.

Climate manipulation must be regulated at the UN level to avoid countries taking matters into their own hands, says a committee of MPs

International rules are necessary to prevent individual countries taking unilateral action to control the earth's climate say MPs.

The report by the Science and Technology Committee said small-scale geoengineering testing was already underway and could be necessary if the 'Plan A' of emissions reduction fails.

'Geoengineering could affect the entire planet and it would be foolish to ignore its potential to minimise or reverse human caused climate change,' said Committee Chairman Phil Willis MP.

[French Students Ask About OIF](#)

16 March, 2010 by dan

Some french students sent an inquiry about OIF... here are my responses:

On Tue, Mar 16, 2010 at 3:13 AM, Justine KLINGELSCHMIDT <justine.klingelschmidt@XXXX.org> wrote:

Thanks a lot for your answer, Mr Whaley. We are conscious that you are a key actor on this issue and we really appreciate to have your point of view . I send you the list of question.

1) First of all, could you tell us more about your professional background?
about your research concerning the oceans?

I have a degree in English. My background is in high-tech. However, my mother--Margaret Leinen--was an oceanographer. I grew up around oceanography, worked on two JGOFS transects taking core samples of the oceans, I first learned how to program developing software for a cryogenic magnetometer, etc.

I would say I have a grounding in the fundamentals. However, i am NOT a scientist.

2) Given the results of all the scientific experiments (LOHAFEX,...), are you still considering ocean fertilization as an effective way to fight global warming?

I think that LOHAFEX showed us that diatoms need silicon to grow. Our analysis is [attached](#). Also, on our home page, you can download the "Why OIF" document. This provides a good grounding in why I think it makes sense to pursue further research into OIF.

3) The LOHAFEX expereriment has been charged by some environmental groups with being a "dangerous geo-engineering project that violated the UN restrictions".
Why do you think this experiment raised such a controversy?

The LOHAFEX project did not violate the UN restrictions. The ETC Group made statements to this effect in an effort to shut the project down. These groups simply do not like the thought of this research taking place. From what I have seen these are more emotional arguments rather than logical ones. Many of the statements they have made in their press releases are factually incorrect, and quite misleading. I don't think ETC has a lot of credibility with the major players. Greenpeace has acknowledged the legitimate reasons for the research to take place, and suggested much of the language that is currently in the LC resolution.

4) What about the institutional framework (UN Conventions: London Convention, Convention on Biological Diversity...)? Is it clear enough or should it be precised?

We are extremely happy with the London Convention's work in this area. They are nearly finished with a rigorous Risk Management Framework for OIF project. This will provide the structure needed by the larger research projects that move forward. The CBD is not a regulatory body. My feeling is that their role here is largely symbolic. They have acknowledged the work that the LC is doing, and seem to be subordinate to that. Remember, they are both UN bodies.

5) Is it difficult for the States to come to an agreement about ocean fertilization?

By the States, do you mean the United States? I think the regulatory authority to develop a framework lies with the LC. The US is a signatory to the convention.

6) Since you know well CLIMOS, one question about it: some say that geo-engineering companies like CLIMOS are violating the precautionary principle, and do not pay enough attention to the potential side-effects on long term. What can you argue against that?

Climos is a research services company at present. Our goal is to help provide the support for these larger more complex research efforts to take place. Ultimately, we think there are important questions that need to be answered about this technique--including, what the potential impacts might be. How can this be a violation of the precautionary principle?

[Kintisch In The Run-up To Asilomar](#)

15 March, 2010 by dan

The [Asilomar International Conference on Climate Intervention](#) begins next week. [Eli Kintisch blogs at Discover Magazine](#) about the various perspectives inside and outside of the NGO community.

[PNAS Paper Looks At Toxicity Of Domoic Acid In OIF Blooms](#)

15 March, 2010 by dan

A PNAS paper released today which looks at domoic acid (DA) production in past OIF experiments has concluded that DA was increased in some of the projects. Though the conclusions from the paper itself were relatively conservative:

"Although there remain uncertainties in extrapolating our results to large oceanic scales, the findings establish potential consequences for developing toxic phytoplankton blooms in pelagic ecosystems, which so far have not been adequately investigated."

Headlines have ranged from the dramatic "[Ocean Geoengineering Scheme May Prove Lethal](#)", and at the NY Times, the oddly phrased, "[A Risk of Poisoning the Deepest Wells](#)" to the more subdued, "[Carbon-capture scheme could cause toxic blooms](#)".

All fail to explore the obvious flaw in this sort of analysis. Namely, that phytoplankton underpin open ocean productivity, that this productivity relies on iron, and that when iron-fed naturally occurring blooms happen, they likely favor--in certain regions--*Pseudonitzschia* or other DA producers. In short, we know that the availability of iron drives much of the oceanic carbon cycle. If DA is produced by artificially stimulated OIF blooms, it is likely produced during natural ones as well.

Moving forward, we need to understand exactly how deep-ocean phytoplankton respond to iron--be it naturally or artificially supplied, whether and in what situations DA is produced, and how the ecosystem is or is not already adapted to this. If it occurs naturally, are organisms that live there used to blooms containing DA? In past climate cycles, when productivity in the deep ocean was much greater, was DA characteristic as well?

These are questions that remain unresolved and need well defined research programs to address.

Update... today's [front page article in the SF Chronicle](#) quotes Ken Coale and Ken Johnson...

"It's a great paper, but I remain a proponent of iron fertilization - if it does indeed work on a very large scale - because it's the only process that takes carbon dioxide out of the atmosphere," Johnson said.

Coale said that "in some cases" his colleagues had also seen large increases in the domoic acid toxin during their own earlier iron fertilization experiments.

But he added: "I'm with Ken (Johnson) on this. We do need to explore all the options and their consequences. My feeling is that iron fertilization is no magic bullet, but it may need to be considered among a large portfolio of carbon sequestration efforts."

[IPCC Chief Pachauri Says Carbon Must Be Sucked From Air](#)

2 December, 2009 by Dan

From the [UK Times Online yesterday](#), interesting to see these kinds of statements....

December 1, 2009

Carbon must be sucked from air, says IPCC chief Rajendra Pachauri

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 Robin Pagnamenta, Energy Editor
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Drastic cuts in carbon emissions may not be sufficient to avoid the worst ravages of global warming and the world will need to suck carbon from the atmosphere to avert permanent damage to the climate, according to a leading world authority on climate science.

In an interview with *The Times*, Rajendra Pachauri, chairman of the UN's [Intergovernmental Panel on Climate Change](#) (IPCC), proposed that new techniques should be applied to help to mop up atmospheric levels of carbon dioxide that have been pumped into the atmosphere from the burning of fossil fuels.

"There are enough technologies in existence to allow for mitigation," he said. "At some point we will have to cross over and start sucking some of those gases out of the atmosphere."

Speaking days before the start of the UN climate summit in Copenhagen, Dr Pachauri, who collected the 2007 Nobel Peace Prize on behalf of the IPCC with Al Gore, said that such a strategy needed to be pursued as a matter of urgency.

The Indian scientist, 69, also said that the target adopted by the 192 governments that are due to attend the conference, of restricting average global temperature rises to less than 2C (3.6F), may be insufficient to prevent catastrophic warming impacts such as a rise in sea levels of between 0.5m and 1.4m (1.6ft and 4.6ft) and enough to devastate many coastal cities around the world such as Shanghai, Calcutta and Dhaka. Instead, he said, a 1.5C rise was a safer target.

Dr Pachauri raised the prospect of so-called geo-engineering, whereby carbon dioxide is actively stripped from the atmosphere. A range of techniques have been proposed including seeding artificial clouds over oceans to reflect sunlight back into space, sowing the oceans with iron ore to [boost plankton growth](#) and using carbon capture and storage technology to fix emissions from power stations.

About 27 billion tonnes of pure carbon dioxide are pumped into the atmosphere every year — equivalent to 7.3 billion tonnes of pure carbon.

Total atmospheric concentrations of carbon dioxide are now at 387 parts per million, up from an historic average of 180 to 280 ppm. Even if radical cuts were adopted by world governments in Copenhagen and adhered to, the lowest level at which they could be expected to stabilise is 450 ppm, say scientists. To prevent a further temperature rise of more than 2C, emissions would need to be stabilised around that level.

Dr Pachauri, speaking to *The Times* on Saturday before travelling to Paris to brief President Sarkozy, suggested that the fossil fuel lobby could be behind a hacking incident last month that led to the publication of thousands of leaked e-mails between climate scientists. He said that it was entirely possible that "corporate interests" had had a hand in the leak.

Dr Pachauri, who was in London for a lecture at the Wellcome Trust organised by the BBC World Service, demanded an immediate investigation into the hacking of e-mails from the University of East Anglia's climatic research unit, which he branded an "illegal act".

He said: "One needs firstly to find out personally who is responsible, who the culprits are and what were their motives. And unless we do that it is likely that similar things will happen in the future."

A prominent climate change sceptic, Steve McIntyre, told *The Times* yesterday that he was "unaware of any evidence that the fossil fuel lobby had anything to do with this and I doubt that they did".

Dr Pachauri dismissed the suggestion that biased research had crept into the IPCC's most recent report on the science of climate change. A complex system of checks and balances was in place to prevent bias being insinuated into the panel's work, he said.

The third way

Governments have focused their attention on mitigation — reducing their carbon output — and more recently on transition — redeveloping existing assets to ensure carbon control. According to the Institute of Mechanical Engineers, there is a third way, geo-engineering; measures that do not just reduce emissions, but take them out of the environment:

Artificial trees These 12m boxes, filled with absorbent materials, soak up and store carbon. The devices, which could be placed by roads, would be emptied regularly and the carbon buried. About 100,000 artificial trees would require about 600 hectares of land, but the carbon that they remove from the atmosphere would be equivalent to all the non-stationary and dispersed emissions to the UK

Algae-coated buildings Strips of algae are fitted to the outside of buildings in units called photobioreactors. Algae naturally absorbs CO2 through photosynthesis. Periodically the algae are harvested and used for biofuels that have an energy rating similar to coal. This solution requires no extra land use

Reflective buildings Between 10 and 50 per cent of solar radiation can be reflected back out of the atmosphere by painting buildings and road surfaces in light colours

[Drs. Holdren, Lubchenco To Show Urgency Of Impacts, Risk](#)

1 December, 2009 by Dan

Pardon me, but can I just say that this took an awfully long time. Should have been doing this months ago, and in a much more public way. Select committee on science and technology is too limited of a forum for this.

HEARING 12/2: State of Climate Science

UPDATED MEDIA ADVISORY FOR 10 AM, WEDNESDAY, DECEMBER 2, 2009

Contact: Select Committee, 202-225-4012
Select Committee Hearing: State of Climate Science
Drs. Holdren, Lubchenco to Show Urgency of Impacts, Risk

**This hearing will be WEBCAST LIVE.

WASHINGTON – With the international climate change talks in Copenhagen fast approaching, there is real urgency to reach diplomatic consensus on a planetary solution. In a hearing this Wednesday, the Select Committee will explore with climate scientists from the Obama administration the urgent, consensus view on our planetary problem: that global warming is real, and the science indicates that it is getting worse.

At the hearing, Chairman Edward J. Markey (D-Mass.) will host two of America's preeminent climate scientists, Dr. John Holdren and Dr. Jane Lubchenco.

Dr. Holdren is the Director of the Office of Science and Technology Policy, and was formerly a professor at Harvard University and the director of the acclaimed Woods Hole Research Center.

Dr. Lubchenco is the Administrator of the National Oceanic and Atmospheric Administration (NOAA), the United States' leading climate office.

The past decade has been the hottest in recorded history, with all of the years since 2001 being in the top 10 of hottest, according to NASA. This summer, the world's oceans were the warmest in NOAA's 130 years of record-keeping. Meanwhile, global heat-trapping pollution continues to rise.

WHAT: Select Committee hearing on the State of Climate Science

WHEN: 10 AM, Wednesday, December 2nd, 2009

WHERE: B-318 Rayburn House Office Building, Washington, DC
and on the web at globalwarming.house.gov

WHO:

Dr. John Holdren, Director, Office of Science and Technology Policy
 Dr. Jane Lubchenco, Administrator, National Oceanic and Atmospheric Administration

[UK Guardian: Watson On Skeptics, Geoengineering](#)

23 November, 2009 by Dan

Interesting [UK Guardian piece](#) today:

"Climate change sceptics and fossil fuel companies that have lobbied against action on greenhouse gas emissions have squandered the world's chance to avoid dangerous global warming, a key adviser to the government has said.

"Professor Bob Watson, chief scientist at the Department for Environment and Rural Affairs, said a decade of inaction on climate change meant it was now virtually impossible to limit global temperature rise to 2C. He said the delay meant the world would now do well to stabilise warming between 3C and 4C.

Watson backed controversial calls for research into geoengineering techniques, such as blocking the sun, as a way to head off dangerous temperature rise – one of the most senior figures so far to do so. "We should at least be looking at it. I would see what the theoretical models say, and ask ourselves the question: how can we do medium-sized experiments in the field?"

Such an effort could divert attention and funds from efforts to cut carbon and switch to cleaner technology, he said. "I think it should be a real international effort, so it isn't just the UK funding it."

[UK And US Committees To Work Together On Geoengineering Regulations...](#)

5 November, 2009 by Dan

[An announcement today](#) without much substance yet, from Phil Willis MP in charge of the UK House of Commons Science and Technology committee:

Commons Committee to work in unique collaboration with US Congressional Committee

The Science and Technology Committee has today announced a new inquiry into the regulation of geoengineering. The House of Commons inquiry is being coordinated with an inquiry into geoengineering which the US Congressional Science and Technology Committee starts today.

The Commons inquiry follows on from the major inquiry that the Innovation, Universities, Science and Skills Committee completed in March 2008, Engineering: turning ideas into reality, which took 'geoengineering' as a case study. The Report examined activities specifically and deliberately designed to effect a change in the global climate with the aim of minimising or reversing man-made climate change.

Building on the earlier work the new inquiry will focus on one aspect of geoengineering: the regulation of geoengineering, particularly international regulation and regulation within the UK. The following terms of reference will be used for the Commons inquiry.

- *Is there a need for international regulation of geoengineering and geoengineering research and if so, what international regulatory mechanisms need to be developed?*
- *How should international regulations be developed collaboratively?*
- *What UK regulatory mechanisms apply to geoengineering and geoengineering research and what changes will need to be made for purpose of regulating geoengineering?*

[NY Times: Scientists Seek 'Plan B' For Climate Change](#)

2 November, 2009 by dan

[NY Times coverage](#) of the recent MIT geoengineering conference.

Researchers who gathered at the Massachusetts Institute of Technology outlined a stark list of potential side effects of different climate engineering approaches, including further depleting the ozone layer, inducing drought and turning the blue sky white.

At the same time, many experts said geoengineering could be a planetary "Plan B," an option to exercise if cutting greenhouse gas emissions can't stave off dangerous climate change.

"Even if we cut emissions, we have a lot of carbon dioxide already in the air," said David Keith of the University of Calgary. "We don't know exactly how bad the climate response will be, and we have to think clearly about how we manage the risk posed by CO2 already in the air."

An ongoing MIT research project into the risks posed by different levels of greenhouse gas emissions suggests that even steep cuts won't guarantee the world will stay under the 2 degree Celsius climate guardrail espoused by many political leaders.

Stabilizing the level of greenhouse gases in the atmosphere at the equivalent of 550 parts per million of CO2 - a goal's that's "not easy," according to MIT Energy Initiative director Ron Prinn -- would give the world just a 25 percent chance of limiting temperature rise to 2 degrees between 1990 and 2090.

"Even with a very tough and expensive target, we are still at risk," Prinn said. "Hence, I think it's legitimate to begin thinking about geoengineering as something that should be on the table."

[E&E Daily: House Geoengineering Hearings Begin This Week](#)

2 November, 2009 by Dan

CLIMATE: Science panel begins discussions of engineering fixes to global warming (Monday, November 2, 2009)

Katie Howell, E&E reporter

While much of Congress is focused on a regulatory plan to curb greenhouse gas emissions, a House panel plans to probe more creative and controversial measures to cool the planet.

The House Science and Technology Committee meets this week to discuss "geoengineering," a concept that would employ technological fixes to stave off global warming. Ideas include injecting sulfur dioxide particles high into the atmosphere to mimic the cooling effect of a major volcanic eruption, seeding the ocean with iron to boost growth of carbon dioxide-fixing algae and installing an array of deflecting lenses between the Earth and sun to reduce solar heat striking the planet.

Mainstream scientists have generally shied away from the proposals, saying they run the risk of further damaging the biosphere or could cost much more than reduction of pollution from fossil fuels. But interest in geoengineering has grown in recent years as concerns mount that emissions reductions policies won't be able to stabilize the planet's climate quickly enough to avoid dangerous global warming.

Now, some scientists are saying the geoengineering options should be researched as a backup solution in case stringent greenhouse gas cuts fail.

The House panel is the first to address the controversial but timely subject and will hear from experts in the field about the proposed options and the potential consequences.

A committee aide said the hearing was not meant to endorse geoengineering, but to serve as an in-depth conversation about the full range of perspectives and potential consequences.

The committee could also discuss with experts previous efforts to control weather and climate. For instance, in the early 19th Century, meteorologist James Espy proposed a scheme to regulate temperature and rainfall by lighting massive wood fires along the Appalachian Mountain ridge to create large clouds and regular rainfall, according to James Fleming, a science, technology and society professor at Colby College.

Other early forays into the field include a proposal to spread reflective particles over the ocean, which was included in a 1965 environmental report from President Lyndon Johnson's Science Advisory Committee, and the Defense Department's attempt to alter the weather in Vietnam for military purposes during the Vietnam War.

"In facing unprecedented challenges, it is good to seek historical precedents," Fleming, who will testify at Thursday's hearing, said during a talk at a geoengineering conference in Cambridge, Mass., last week. "History matters, and it matters that it goes into conversations about public policy," he added to E&E.

Fleming advocates for the consideration of the historical, ethical, legal, moral and societal aspects of geoengineering -- and not as an afterthought to scientific research. He is concerned how geoengineering could alter humans' relationship with nature. For instance, injecting sulfate into the atmosphere would create a milky white -- rather than blue -- sky. And it would block out stars at night so ground astronomy would be impossible.

Reporter Lauren Morello contributed.

Schedule: The hearing is Thursday, Nov. 5, at 10 a.m. in 2318 Rayburn.

Witnesses: Ken Caldeira, senior scientist, Carnegie Institution of Washington's Department of Global Ecology; John Shepherd, professor, University of Southampton's National Oceanography Centre; Lee Lane, co-director, American Enterprise Institute's geoengineering project; James Fleming, professor and director, Colby College's Science, Technology and Society department; and Alan Robock, environmental sciences professor, Rutgers University.

[Environmental Research Letters: Focus Issue On Geoengineering](#)

1 November, 2009 by dan

Six articles this month in an [Environmental Research Letters focus issue](#) on geoengineering. Thoughtful pieces on a range of issues, particularly including questions of risk and ethics and the idea of ecological analogues of geoengineering.

[Modification of cirrus clouds to reduce global warming](#)

David L Mitchell and William Finnegan

[Climate engineering and the risk of rapid climate change](#)

Andrew Ross and H Damon Matthews

[Researching geoengineering: should not or could not?](#)

Martin Bunzl

[Of mongooses and mitigation: ecological analogues to geoengineering](#)

H Damon Matthews and Sarah E Turner

[Toward ethical norms and institutions for climate engineering research](#)

David R Morrow, Robert E Kopp and Michael Oppenheimer

[On the possible use of geoengineering to moderate specific climate change impacts](#)

Michael C MacCracken

[Asking The Obvious About 350.org... Like How?](#)

31 October, 2009 by Dan

Jamais Cascio [asks the obvious](#) in this fastcompany piece about the climate change activist group 350.org. If we're already at 387, then how are we going to get back to 350? It not only requires cutting emissions to zero, but removing CO2 from the atmosphere as well. And there is scant discussion of how they would expect to do so... reforestation, biochar? As Jamais points out, these are slow to act.

"But getting back to 350ppm requires more than a rapid cessation of anthropogenic sources of atmospheric carbon. It requires an acceleration of the processes that cycle atmospheric CO₂. Planting trees is an obvious step, but it's [slow](#) and actually doesn't do enough alone. We'll also need to bring in more advanced carbon sequestration techniques, such as [bio-char](#). The combination of the two would likely bring down atmospheric carbon levels, given enough time.

Unfortunately, we may not have enough time."

The point of the 350 framing is that we're already past what could be construed as a "safe" level. In other words, it highlights the danger of potential tipping points and how we really have no idea how far ahead they lie.

[UNEP Looks To The Oceans For Carbon Sequestration](#)

14 October, 2009 by Dan

UNEP today [announces a report](#) which highlights the importance of the ocean in the role of carbon sequestration, and also of the role that markets can perform.

"The Blue Carbon report, compiled in collaboration with the Food and Agricultural Organization (FAO) and the United Nations Educational, Scientific and Cultural Organization (UNESCO), puts some hard figures on the carbon capturing potential of the marine environment and on the impact of marine degradation on climate change.

It also outlines the way markets might begin paying developing countries for conserving and enhancing the marine environment's carbon capture and storage services (CCS) and the links between healthy oceans and adaptation to climate change.

Currently, several developed countries are considering spending billions of dollar on CCS at power stations while the CCS services of natural systems, such as the seas and oceans, are tested and probably more cost effective."

[NY Times-- Are We Too Late?](#)

17 August, 2009 by dan

[NY Times Op-Ed "Are We Too Late?"](#)

H.D.S. Greenway begins to talk about the elephant in the room, and asks what has really been forbidden territory

in the climate discussion for most of the mainstream policymakers--up until now guided by 2 degrees C threshold thinking. i.e. "What if the trend is irreversible?" "What if it cannot be prevented?"

The effects of humanity's industry, piggy-backing on a normal warming trend that has been going on since the 19th century, is causing temperatures to climb at an unprecedented rate. On that most of science agrees. But what if the centuries-long build-up of gasses and nature itself have conspired to make this trend irreversible?

This is not an argument against a strong effort on the part of mankind to at least slow down the warming. The United States and the world can and should make a big effort to stop making the problem worse.

But the world is not united. The developing countries feel it is unfair to demand caps just as they are industrializing, and we are moving into a post-industrial economy. It is simply not possible to shut down enough of the world's smoke stacks, and a lot of cap and trade begins to sound like a shell game.

So when the world meets in Copenhagen to discuss climate change come December, I hope there will be more thought on what has to be done if climate change cannot be prevented.

[UK Guardian: Arctic CO2 Levels Growing At An 'unprecedented Rate', Say Scientists](#)

4 May, 2009 by dan

The [UK Guardian reports today on record CO2 numbers](#) from a key arctic station.

"The concentration of carbon dioxide in [the atmosphere](#) has reached a record high, according to the latest figures released by an internationally regarded measuring station in the [Arctic](#).

The measurements suggest that the main greenhouse gas is continuing to increase in the atmosphere at an alarming rate [despite the downturn in dip in the rate of increase of the global economy](#).

Levels of the gas at the Zeppelin research station on Svalbard, northern Norway, last week peaked at over 397 parts per million (ppm), an increase of more than 2.5ppm on 2008. They have since begun to reduce and today stand at 393.7ppm. Prior to the industrial revolution, CO₂ levels were around 280ppm."

[Nature Editorial Calls For Geoengineering.](#)

4 May, 2009 by dan

Nature [calls for serious consideration of geoengineering in their lead-off editorial](#) this last week.

"The latest scientific research suggests that even a complete halt to carbon pollution would not bring the world's temperatures down substantially for several centuries. If further research reveals that a prolonged period of elevated temperatures would endanger the polar ice sheets, or otherwise destabilize the Earth system, nations may have to contemplate actively removing CO2 from the atmosphere. Indeed, the United Nations Intergovernmental Panel on Climate Change is already developing scenarios for the idea that long-term safety may require sucking up carbon, and various innovators and entrepreneurs are developing technologies that might be able to accomplish that feat (see page 1094). At the moment, those technologies seem ruinously expensive and technically difficult. But if the very steep learning curve can be climbed, then the benefits will be great.

More radical still is the possibility of cooling the planet through some kind of 'geoengineering' that would dim the incoming sunlight (see page 1097). The effects of such approaches are much more worrying than those of capturing carbon from the air, however. The cooling from geoengineering would not exactly balance the warming from greenhouse gases, which would cause complications even if the technology itself was feasible — something for which the evidence has been circumstantial, at best.

But discussions about the possibilities offered by geoengineering could also lull the world's leaders into complacency — if they lead them to believe that the technology will provide an escape hatch if the climate ever does reach a tipping point. This does not mean that the discussions should be avoided, but rather that the speculations need to be backed up with a solid body of research. Moreover, geoengineering research should be framed not as a hope for deus ex machina fixes to sudden global deterioration, but as a palliative cushion for the worst excesses of the peak years that are inevitable even after emissions start to be cut. A world slightly shaded from the Sun while its carbon levels are brought down by means of active capture would be a strangely unnatural place — but not necessarily a bad one, compared with the alternatives."

[AMS Issues Draft Statement On Geoengineering](#)

20 April, 2009 by Dan

The AMS Draft Statement on Geoengineering the Climate System [is available via the AMS home page now...](#)

If you have comment on this draft AMS Statement currently under consideration, you may transmit those comments to the AMS Council by sending a message to the following e-mail address by April 23 2009: statement_comments@ametsoc.org

AMS Policy Statement on Geoengineering the Climate System

Draft 7 March 2009

Human activities have very likely caused most of the well-documented change in global climate over the last half century. Unchecked future greenhouse gas emissions, particularly of carbon dioxide from the burning of fossil fuels, will almost certainly lead to additional climate impacts such as further global warming, continued sea level rise, greater rainfall intensity, more serious and pervasive droughts, enhanced heat stress episodes, ocean acidification, and the disruption of many biological systems. The resulting inundation of coastal areas, severe weather impacts, and loss of ecosystem services will likely cause major negative impacts for most nations.

Geoengineering could conceivably offer targeted and fast-acting options to reduce acute climate impacts and provide strategies of last resort if abrupt, catastrophic, or otherwise unacceptable climate change impacts become unavoidable by other means. However, geoengineering must be viewed with great caution because manipulating the Earth system is almost certain to trigger some adverse and unpredictable consequences.

[Truthout: Toward Climate Geoengineering?](#)

20 April, 2009 by dan

While I sympathize with the takeaway from the preamble of this [truthout opinion piece by Australian paleoclimatologist Dr. Andrew Glikson](#), I think this frame is unhelpful to the reputable scientists and thoughtful individuals who are seeking funding and freedom to do the research needed to understand if these options are available to us at this advanced stage of warming.

"That global climate change has reached an impasse whereby the "powers-to-be" are entertaining climate geoengineering mitigation, instead of the urgent deep reduction of carbon emissions required by science, represents the ultimate moral bankruptcy of institutions and a failure of democracy"

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