



Climate Change : Natural Disasters

The Cold Front of the Climate Battle

Few people know the polar regions like Alain Hubert. Back from a 1,700-kilometer trek from Siberia to Greenland and a winter's work at the Princess Elisabeth Polar station in the Antarctic, the Belgian civil engineer, explorer, and environmentalist explained at the OECD Forum 2008 why the world's last frontier is in danger, and why polar ice is so important in the global climate system.



Alain Hubert, Co-Founder and Director of the International Polar Foundation

"Fifteen years ago, it was possible to go on an expedition during the springtime and early summer. But today, this would be absolutely impossible; there's too much open water." (Photo: IPF)

There has been a lot of talk about dying polar bears and melting ice. How real is the threat of climate change in the polar regions?

What is important to understand is that the Arctic Ocean is mainly covered by ice, which reflects a great percentage of the sun's energy back into space. This is especially true during the summer, when there are 24 hours of daylight.

One day, the Arctic Ocean will be completely free of ice during the summer months. Instead of reflecting solar energy, it will absorb more than 60 percent of it and get much warmer. The chemical exchange between the atmosphere and ocean will then totally change. We have no idea of how dangerous this will actually be for us.

You have been going on Arctic expeditions for more than a decade. Have things really changed that much?

For the moment, the surface of the ice is not necessarily shrinking from year to year because climate change is not a linear process. You can have a very cold winter in the Arctic like there was this year, even though the previous year was not so cold.

What has changed dramatically is the thickness of the ice. It is not as thick as in the past. It moves about more easily and creates ice barriers sometimes three to four meters high. There is also more open water. Fifteen years ago, it was possible to go on an expedition during the spring and early summer. But today, this would be absolutely impossible; there's too much open water.

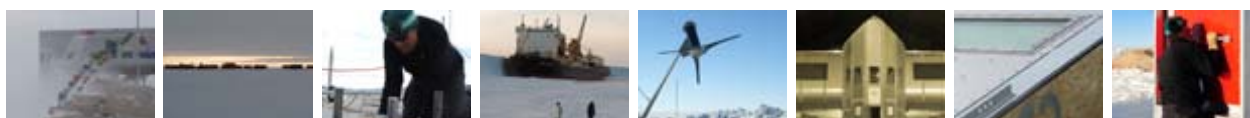
When I was in the middle of the Arctic last year during my Arctic Arc expedition, the channel between Greenland and Ellesmere Island hadn't frozen during the previous winter. Without satellite monitoring, I would have been stuck 300 kilometers away from the coast because of the open water. This was the first time in history that it hadn't frozen.

Because last winter was so cold, Arctic sea ice has grown a lot. Does this mean the situation is less critical now?

There are two things that need to be checked: one is the ice surface reduction during the summer, and second is the ice thickness reduction. Although the ice can be thinner, it still covers the sea and reflects the sun. However, despite recent cold winters, we have found a 60-percent surface reduction. Some data is collected by submarines and ground observations, but we still don't know enough about its thickness.

At present, most of the research in the Arctic measures how thick the ice is. Normal satellites are unable to correctly determine the thickness. Satellite pictures can estimate the ice surface reduction in summer, but not the thickness. Many current models predict that the Arctic sea ice cover will disappear completely between 2013 and 2030.

Antarctic Station



It is very difficult to monitor the Arctic. You can't really install a meteorological station like before because the ice is constantly breaking up. You can't do it with a submarine either, except at specific points. You can't even monitor the ice by foot, because it is too vast – almost two million square kilometers.

A new ESA satellite, Cryosat 2, will be ready next year. It is specifically designed to measure the thickness of the ice, but even this tool is unable to differentiate snow from ice. For this reason, we still have to take ground measurements of the snow thickness. And we have to take all this into account if we want to predict when the Arctic will be ice-free during the summer.

What will happen when the Arctic is ice-free?

The change will most likely be radical. The low-pressure zone around the Arctic will probably move, and evaporation of water in the atmosphere will increase a lot. These changes could be decisive for the weather all over the world. No one can predict what will happen.

This research is totally new; a decade ago no one was even looking into it yet. In Europe, we have an important project called DAMOCLES. Amongst other things it measures the salinity, density, and temperature of the Arctic Ocean and focuses on the ocean's conveyor belt and Gulf Stream. Will the current slow down? Could it stop?

Some scientists say that the Gulf Stream will stop as soon as the Greenland ice sheet melts, but to know how this will actually happen is difficult. Science needs more time and money to be able to give better predictions. People always want to know exactly what will happen, but this is absolutely impossible.

Once the ice is gone, people will start looking for oil. What impact could this have on animals and plants in the Arctic?

Don't forget that you will still have icebergs in the Arctic depending on where you drill. If you build a drilling platform, how will you prevent icebergs from crashing into it? How does one avoid major accidents? The balance of the ecosystem is under threat and its potential destruction is a risk we cannot take.

The other point worth mentioning is that oil will become much more expensive to refine. It is always the same thing: we repeatedly try to find a solution that allows us to continue as before, when we should be developing new forms of energy and working on efficiency.

Some scientists say that the ice in Antarctica is still growing, not shrinking. What is the situation there?

Antarctica is a huge continent. In the east, the ice is growing. But over the western part and the peninsula, the ice is shrinking. Western Antarctica is like a little arrow pointing towards the tropics, and temperatures there are higher.

The Antarctic Plateau is high, almost 4,000 meters above sea level in certain places, with an average temperature of minus 28 degrees Celsius. So, even if temperatures rise there by three or four degrees, it doesn't matter much. The temperature stays well below zero degrees and doesn't melt the ice.

This part of the Antarctic ice is growing because, with higher temperatures comes more snow. But other parts of Antarctica are melting. Research is still going on, but we don't have enough information which we can rely on yet to give us a good idea of what will happen.

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I will give you an example. If you go to Greenland in September, you will see lots of canyons in the ice that are filled with water, like big rivers. Suddenly, the water disappears to the bottom of the ice sheet and runs down the bedrock to the sea. This reduces the friction of the ice against the rock and makes the glacier move faster to sea. It melts more quickly, but how much faster, we do not know yet.

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