

Cryosat Mission

Start A- Roll : TC : 10.00.40

One of the most hotly debated questions amongst scientists and politicians at the moment is whether global warming is responsible for melting of the polar ice sheets? Some scientists believe we are at a crucial moment in history, especially when it comes to the future of the Greenland Ice sheet and Arctic sea ice.

Quote: Duncan Wingham/Lead investigator, Cryosat

“The present situation is delicately poised, in Greenland there is plenty of information that the melting is accelerating and once Greenland starts to melt it will get lower, because it gets lower it’ll get warmer there’ll be more melt and once Greenland goes it won’t come back because it will be too warm at sea level to do it. In Greenland I think we’re at the point of no return unless we stop the warming”.

This situation comes as no surprise to the European space agency which has spent the last 6 years developing Cryosat, a new Space Mission due to be launched in 2005. Cryosat will monitor land and sea ice in the north and south Polar Regions. Over three years it will measure variations in the thickness of the ice with extraordinary precision. Scientists are eagerly awaiting this information which will make a major contribution towards determining whether or not the Earth’s ice masses are thinning today, due to global warming.

.Quote: Duncan Wingham/Lead investigator, Cryosat

“There are 2 big ice sheets on earth. 1 is in the Antarctic, and there is a very large amount of ice down there and even quite small changes in the ice could produce quite significant changes in sea level, so if you live near sea level, and about a tenth of the population does, it’s rather important to know what’s going on down in the Antarctic. In the Arctic there’s another ice sheet but rather a different one, it’s a very delicate thin layer of frozen sea water, and global warming will probably destroy this almost completely in the next 70 years, if we destroy that ice cap then we’ll change the ocean circulation and if we change the circulation we could change our climate, even in European latitudes we could change our climate.”

Ice and snow, which cover about 17% of the earth’s surface play a crucial role in regulating the earth’s climate in a number of ways: by reflecting summer sunlight back out into space, by insulating the ocean against the intense cold of the polar atmosphere in winter, and by influencing global ocean circulation patterns. Any large-scale melting of the earth’s snow and ice potentially means a dramatic change in global climate and sea level.

End Quote: Duncan Wingham/Lead investigator, Cryosat

“At one extreme it’s possible that we could make the winter climate of Europe very much colder, we could freeze up all the rivers for example, we might even start to freeze up part of the north sea. At the other extreme the changes may in fact be rather subtle and indeed possibly be even hard to see, but the truth is today we don’t know, one of the reasons we don’t know is because we don’t know enough about the ice itself”.

Which is why we need CRYOSAT - to find out, with precision, what is happening to the earth’s Ice sheets. To do this CRYOSAT will carry the first microwave radar altimeter especially designed for measuring the shape and volume of ice. This instrument, known as SIGHRAL, can measure all types of land and sea Ice, from the kilometre thick ice sheets of the Antarctic and Greenland to the smaller floes of sea ice floating near the edges of ice sheets and in the Arctic Ocean. The measurements will be made by sending out very short radar pulses and measuring the time it takes for the signals to travel to the ground and back. The results will be global measurements of ice thickness of unprecedented accuracy.

Quote: Duncan Wingham/Lead investigator, Cryosat

“this instrument unlike previous ones has been specifically designed to deal with the marine ice in the arctic ocean, in particular it has a much higher resolution than the previous generations of instruments and this should allow us to distinguish individual pieces of ice in the ocean and so measure changes in thickness much more accurately than before”.

The challenges facing the Cryosat mission are twofold, to acquire accurate measurements of the thickness of floating sea ice so that annual variations can be detected; and to survey the surface of the ice

Quote: Duncan Wingham/Lead investigator, Cryosat

“Within 3 years of the launch of Cryosat we should start to have very interesting information coming back to us after about 3 years, we need the time because we need to see the whole freeze store cycle and we need to see it twice to make sure the instrumentation is working correctly, but after about 2 years we should know a lot of things about the ice we don’t know today”.

Once Cryosat is operational, it will transmit around 400 Gigabits of data a day to the ESA ground station in Kiruna in Sweden . The important job of analysis then starts and the processed data will be distributed, free of charge, to more than 50 selected scientific teams from around the world, including meteorological organisations, polar research laboratories and universities, to whom it is an invaluable resource.

The measurements taken by Cryosat will ensure that the thickness of the Earth’s polar ice can be determined with an unprecedented accuracy over a period as long as three years, the lifetime of Cryosat. It is this three-year record with centimetre precision, which will provide a large piece of the jigsaw puzzle when it comes to determining

whether the polar ice has indeed started to melt due to climate change, and where it is happening. But why is this information so important and what implications does it have?

Quote: Duncan Wingham/Lead investigator, Cryosat

“The information we get from Cryosat is important because via our understanding of the ice and via our understanding of the ocean we can predict for example sea level and we can predict for example winter temperatures, this allows us to manage our coast properly, in a way that we probably don’t today and if big temperature changes are on their way, it allows for us to plan for those in terms of transport , energy uses , the way we live our lives, we need to be able to predict the future”.

B-ROLL -----

10 06 42 ITV WINGHAM / END AROLL/ START BROLL
10 07 02 ITV WINGHAM
10 07 24 ITV WINGHAM
10 08 09 ITV WINGHAM
10 08 34 ITV WINGHAM
10 08 57 ITV WINGHAM
10 09 47 ITV WINGHAM
10 10 16 ITV WINGHAM
10 10 37 ITV WINGHAM
10 11 00 WINGHAM & Scientist analyzing data (17 shots)
10 14 37 END BROLL
10 14 51 END PROGRAM