

CRYOSAT

polar ice fields:

are they melting?

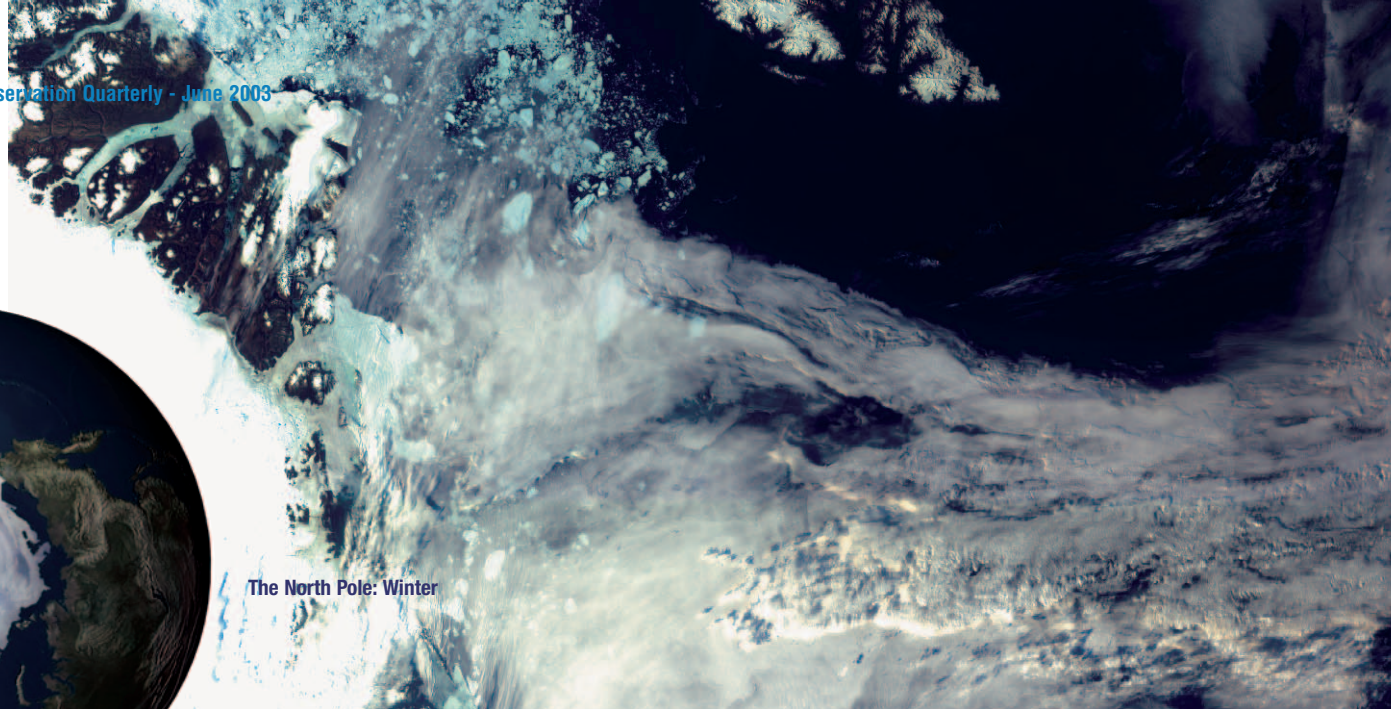
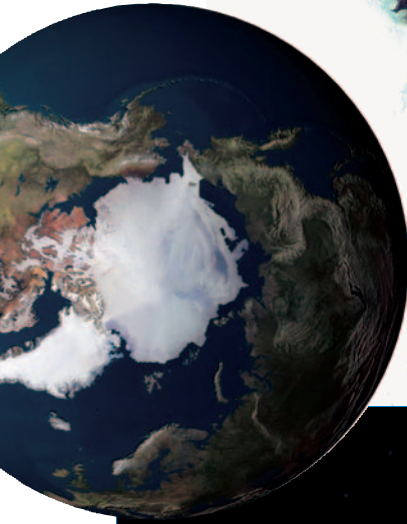
The 1990's was the warmest decade in the past 1000 years (according to researchers at the University of East Anglia), and this trend has continued into the current decade with 2000, 2001 and 2002 all being counted amongst the top 10 warmest years since records began. Scientists at the Hadley Centre predicted that 2003 would match the current warm record holder, 1998, and it already looks as though they were right. It is widely believed that this steady increase in global temperatures will have an impact on the polar ice fields and it is precisely to measure and monitor any such changes that the CryoSat Project was conceived in 1999.

The CryoSat project, as the first of the new Earth Explorer Opportunity missions is on a fast track development. The project is quickly approaching fruition but a significant stock-taking is being performed as this article is written. This is the "Critical Design Review" where ESA and its industrial partners carefully check the results of testing and analyses of all of the elements of the CryoSat satellite now being integrated. All the indications are that, apart from the usual crop of teething troubles which such reviews bring to light, the innovative development approach being pioneered with CryoSat is working.

In this approach much of the equipment is rebuilt from existing designs and the usual engineering test model of the satellite is replaced by software simulations of the equipment and a capable software/hardware interface to connect them to either a test version, or a software

emulation, of CryoSat's on-board computer. This "virtual satellite" is relatively easy to clone, in various configurations, and permits rapid and parallel testing activities. It is this development which is the focus of the present stage of review; later in the year the development of the scientific payload will also be put under the magnifying glass and finally the integration of all the parts and the test results will come under scrutiny.

In parallel the ground segment activities are maturing fast, both in setting up the Flight Operations Control Centre and its ground station at Kiruna as well as the all-new system which will perform the demanding scientific data processing needed to convert the raw radar measurements into data products useful to polar scientists. As well as these systems a scientific team has been set up to calibrate and validate CryoSat's data products. This is important so that the scientific data can be eventually released with a definitive statement about their quality and the limits of their accuracy. The first experimental measurements in the Arctic have already been performed in order to prove the feasibility of making the required measurements in the field. A more general Announcement of Opportunity (AO) will be released before the end of the year inviting proposals from the scientific community to use and exploit the CryoSat data for polar research. This AO is a major step and effectively unveils the project to the scientific community, identifying it as a major new tool in the collection of measurement data in polar regions and inviting participation.



The North Pole: Winter

The project is now at a mature stage and about to become promoted in the scientific community. As part of this process ESA has released a definitive brochure describing the overall objectives of the mission and the contribution CryoSat will make towards achieving them, including a description of how its payload works. This brochure is available from ESA Publications' Bookshop, as BR-199 CryoSat – ESA's Ice Mission. It can also be downloaded from the web at

<http://esapub.esrin.esa.it/publicat/news.htm>

