→ ICE APPLICATIONS

About 10% of the Earth's surface is permanently covered by glaciers, ice caps and ice sheets, collectively referred to as the cryosphere. These different forms of ice, mainly found in polar and high-altitude regions, play a critical role in regulating the Earth's climate and sea level. Recent observations point to rapid, possibly irreversible changes of the cryosphere. The monitoring of ice is therefore imperative for the future of our planet.

Remote sensing offers a new and valuable tool for ice monitoring and a variety of ice applications. For example, it supports ship routing and offshore operations in polar areas by mapping ice cover and tracking icebergs. It provides also measurements of essential ice variables such as sea-ice thickness and continental ice topography to monitor climate change. It allows the characterisation of sea-ice drift and the determination of glacier flow velocities.







Antarctica ice sheet thickness measured by Cryosat-2vvv m64

Find out more at: www.esa.int/eduspace

 Cyosat mapping changes in ice thickness, September 2007



ICE COVER

Optical imagers, as well as radar imagers, measure the ice cover extent and track drifting icebergs in ocean currents. These are important indicators for the monitoring of Climate Change and can support maritime navigation in our increasingly busy Arctic waters.

GLACIER FLOW VELOCITY

Using advanced techniques such as SAR Interferometry, radar instruments allow the measurement of glacier flow velocity. This information is used to infer glaciers' mass balance which is a sensitive indicator of the Earth's climate.

SEA-ICE THICKNESS

Radar altimeters, such as the one on board ESA's CryoSat-2 satellite, measure with centimetre precision the ice sheet and sea-ice thickness. This enables quantification of the amount of ice melting in polar regions and its contribution to qlobal sea level rise.