THE CAMBRIDGE STATISTICS DISCUSSION GROUP

Wednesday 7th May 2003 7:15 for 7:45

Department of Applied Mathematics and Theoretical Physics,
Centre for Mathematical Sciences,
Wilberforce Road,
Cambridge

Statistical Properties of Sea Ice Thickness - is the Arctic Ice Disappearing?

Peter Wadhams

Department of Applied Mathematics and Theoretical Physics,
Centre for Mathematical Sciences

Abstract: When viewed from the air or the surface, polar sea ice presents an apparently haphazard and chaotic vista of upturned ice blocks, piled-up ridges, sheets of thin and thick ice, and areas of open water. In fact, the distribution of ice thickness and the distribution of these features follow well-defined statistical relationships, which enable us to characterise the state of the ice cover by a small number of parameters. We show how these results are obtained and how they can be used.
The most exciting recent data from the Arctic, obtained by running under the ice with a nuclear submarine and measuring ice thickness by upward sonar, is that the mean thickness has diminished by more than 40% over the past 20 years. While some climate modellers predict that the entire ice cover will disappear by the 2080s, others claim that even the 40% observed thinning is actually a statistical artefact, a result of geographical bias in the areas covered by the submarines, and that the ice as a whole may not be thinning at all. Here is a question that can perhaps be answered, with suitable error bars, by the proper application of statistics.

Speaker: Peter Wadhams, formerly Director of the Scott Polar Research Institute, has recently moved to DAMTP at their new buildings in the Centre for Mathematical Sciences. He also has a working link with the Dunstaffnage Marine Laboratory in Oban, Scotland. He and his research group work on ocean and sea ice problems of the polar regions, particularly on evidence of climate change. He has made four voyages to the Arctic in nuclear submarines to collect some of the data discussed in this lecture.

Directions:. The main entrance is reached from Clarkson Road by going along the footpath to the right of the Newton Institute, and turning left through the gatehouse towards the main building (Pavilion A), which has a glass front and a curved grassed roof. The main entrance is in the middle of the glass front. (See also enclosed map). Free Parking is available after 5pm on Clarkson and Wilberforce Roads and by entering the site off Wilberforce Road. Admittance may be difficult after 7:45.

Provisional Next Meeting:
14th October – Peter Treasure (Strangeways Research Laboratory) on 'Statistical Aspects of Breast Cancer Screening'.

Supper: Some members eat before a talk at the University Centre meeting in the downstairs bar at 6pm. All welcome !
Subscriptions: of 4 pounds per member are now due for the 2002-2003 session.
Secretary: Peter Watson, MRC Cognition and Brain Sciences Unit, 15 Chaucer Road, Cambridge CB2 2EF;
telephone 01223 355294 Extension 801; E-mail peter.watson@mrc-cbu.cam.ac.uk