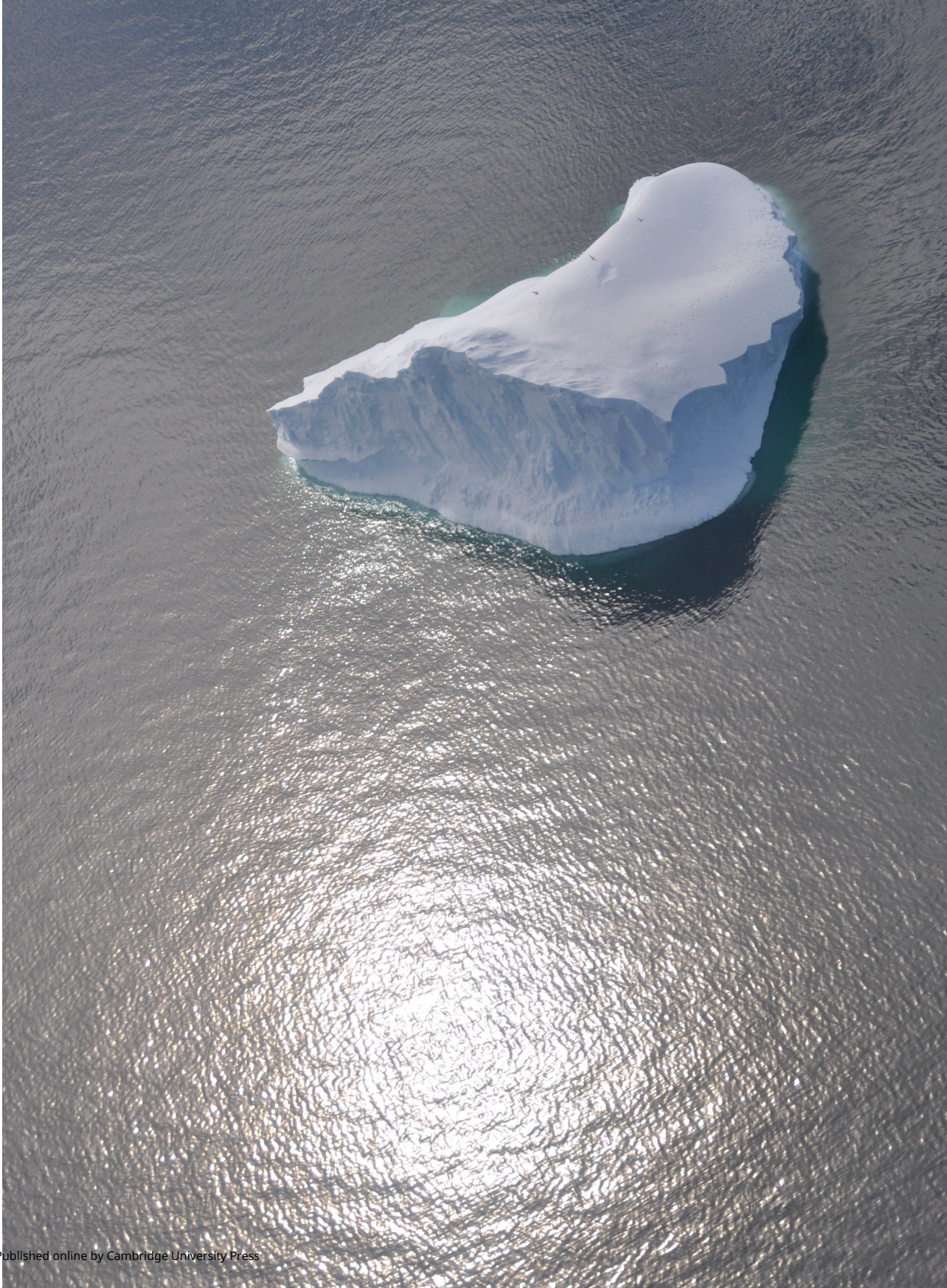




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## **Annals of Glaciology 57(73)**

Contemporary ice-sheet dynamics: ocean interaction, meltwater and non-linear effects

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**Cover illustration** Iceberg in Marguerite Bay, Antarctica taken January, 2013 from a Twin Otter at around 100 m altitude. Approximate size of iceberg is 150 m across. Photograph by David Vaughan, British Antarctic Survey.

This issue is dedicated to Robert H. (Bob) Thomas, 1937–2015



An obituary for Bob was published in the News Bulletin of the International Glaciological Society (ICE) Issue 1 of 2015, (Number 169), pages 27–31.

Photo: Robert H. (Bob) Thomas surveying Jakobshavns Glacier, west Greenland, from its north fjord wall in July 1976. Photograph by Craig S. Lingle, University of Alaska Fairbanks.

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## PREFACE

Over the last fifteen years, glaciology has experienced a profound shift in paradigm prompted by the advent of satellite-based observations of the ice sheets. At both poles, observations increasingly show the sensitivity of grounded ice to changes in the ocean, prompting a strong research focus on understanding how ice sheets change in response to variations in ocean climate on timescales far shorter than those which are traditionally associated with them.

The origins of the International Glaciological Society's international symposium on 'Contemporary ice-sheet dynamics: ocean interaction, meltwater and non-linear effects' lay in recognising these shifts. The symposium was held between 16th and 21st August 2015 at Churchill College, University of Cambridge, United Kingdom (UK). It was aimed at bringing together researchers from the oceanographic and glaciological communities who use both observational and modelling tools to understand the interrelated sequence of processes that ultimately link open-ocean variations with changes in the inland ice sheet, and to provide an overview of the current state of knowledge in this rapidly-moving field of research.

The symposium was structured around the following themes covering the sequence of environments and disciplines from the open ocean to the inland ice sheet, and including observations and modelling of the relevant processes.

1. Transport of ocean heat across the continental shelf break (oceanographic mechanisms that allow heat onto the continental shelf, influence of teleconnections, shelf break ocean dynamics).

2. Continental shelf-ocean processes (processes influencing shelf conditions, circulation in proglacial fjords, impacts on the ice shelf cavity and tidewater glacier calving fronts, air-sea exchange, sea-ice formation, coastal polynyas).

3. Sub-ice shelf processes and environment (ice shelf basal mass balance, ice-ocean boundary layer, sub-ice shelf heat transport).

4. Tidewater glacier and ice-shelf stability (iceberg calving processes, impact of sub-glacial drainage on ice front processes, ice-shelf disintegration, structure of ice shelves).

5. Ice sheet-stream-shelf glaciology (impact of ice shelves on ice streams, grounding line dynamics, upstream propagation of grounding line changes, ice-stream dynamics, ice-stream basal conditions, sub-ice-stream hydrology, ice-sheet and ice-stream mass balance).

6. Dynamics and stability of ice sheets (evidence of past ice-sheet instability from proxies, observed state of the ice sheets, non-linear dynamical processes).

7. Integrated understanding of the processes linking oceans and ice sheets (external drivers and internal instabilities, model predictions of future behaviour, overall effect of ocean and atmosphere on the ice sheets).

The symposium was sponsored by the British Antarctic Survey (BAS), the UK's Natural Environment Research Council (NERC, both directly and through its iSTAR research programme), the Scott Polar Research Institute (University of Cambridge), Planet Ocean Ltd, RS Aqua Ltd and the UK Polar Network, as well as the Greenland Ice Sheet Ocean Science Network (GRISO) and the Forum for Research into Ice Shelf Processes (FRISP).

**Tony Payne**

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