



Vol 64 No 248

*Journal of*

ISSN: 0022-1430

# GLACIOLOGY

Published for the International Glaciological Society, Cambridge, UK





# International Glaciological Society

High Cross, Madingley Road, Cambridge CB3 0ET

## JOURNAL OF GLACIOLOGY

### Chief Editor

JG Cogley

### Emeritus Chief Editor

TH Jacka

### Associate Chief Editors

P Bartelt

SH Faria

H Jiskoot

F Pattyn

### Scientific Editors

B Csathó

N Eckert

HA Fricker

CA Geiger

NF Glasser

R Greve

SJ Jones

M Koutnik

B Kulesa

H Pritchard

S Rasmussen

JM Shea

D Shugar

C Tijm-Reijmer

M Tranter

## INTERNATIONAL GLACIOLOGICAL SOCIETY

Founder: G Seligman

### President

FJ Navarro

### Vice-Presidents

G Flowers

GH Gudmundsson

J Stroeve

### Secretary General

MM Magnússon

### Membership and Accounts Manager

LM Buckingham

## INTERNATIONAL GLACIOLOGICAL SOCIETY

The Society was founded in 1936 to provide a focus for individuals interested in practical and scientific aspects of snow and ice. Membership is open to all individuals who have a scientific, practical or general interest in aspects of snow and ice study.

Papers on glaciology are printed in the *Journal of Glaciology*, which is published six times a year. The Society also publishes the *Annals of Glaciology*, a peer-reviewed, thematic journal, two to four times a year. The Society's news bulletin, *ICE*, is published three times a year.

The Society sponsors symposia, meetings and workshops in many countries throughout the year.

*Journal of Glaciology* publishes original articles and letters concerning scientific research into any aspect of ice and snow, and interactions between ice, snow, climate and other environmental phenomena including the biosphere and permafrost. Research techniques described in the Journal include, for example, field studies, remote sensing, computer modelling and laboratory studies. Research topics include the nature of and changes in mountain glaciers and ice sheets, including former ice sheets. For example, ice cores extracted from the glaciers and ice sheets reveal detailed information on past atmospheric composition and climate, and changes in the extent and thickness of the ice sheets are also related to climate change. The physical, chemical and crystallographic properties of ice and snow are included, especially but not only as they relate to the flow of ice and to past climate. The Journal also publishes studies of sea ice, and of icebergs, along with their interactions with climate on shorter time scales, and with the ocean. Snow and avalanche research is included in the Journal, with several recent articles investigating avalanche dynamics. Snow and ice on other planets is also within the realm of the Journal of Glaciology, as are studies of atmospheric ice.

Published for the International Glaciological Society, Cambridge, UK by Cambridge University Press

Printed in the UK by Bell and Bain Ltd.

# *Journal of* **GLACIOLOGY**

CONTENTS Vol 64 No 248 2018

- 855 **Zhiheng Du, Cunde Xiao, Minghu Ding, Chuanjin Li**  
Identification of multiple natural and anthropogenic sources of dust in snow from Zhongshan Station to Dome A, East Antarctica
- 866 **Jolana Hrubá, Gunther Kletetschka**  
Environmental record of layers of bubbles in natural pond ice
- 877 **Sven Erik Avak, Margit Schwikowski, Anja Eichler**  
Impact and implications of meltwater percolation on trace element records observed in a high-Alpine ice core
- 887 **Elizabeth A. Bagshaw, Nanna B. Karlsson, Lai Bun Lok, Ben Lishman, Lindsay Clare, Keith W. Nicholls, Steve Burrow, Jemma L. Wadham, Olaf Eisen, Hugh Corr, Paul Brennan, Dorte Dahl-Jensen**  
Prototype wireless sensors for monitoring subsurface processes in snow and firn
- 897 **Basile de Fleurian, Mauro A. Werder, Sebastian Beyer, Douglas J. Brinkerhoff, Ian Delaney, Christine F. Dow, Jacob Downs, Olivier Gagliardini, Matthew J. Hoffman, Roger Leb Hooke, Julien Seguinot, Aleah N. Sommers**  
SHMIP The subglacial hydrology model intercomparison Project
- 917 **Rubén Basantes-Serrano, Antoine Rabatel, Christian Vincent, Pascal Sirguy**  
An optimized method to calculate the geodetic mass balance of mountain glaciers
- 932 **Vikram Goel, Carlos Martín, Kenichi Matsuoka**  
Ice-rise stratigraphy reveals changes in surface mass balance over the last millennia in Dronning Maud Land
- 943 **Ankit Pramanik, Ward Van Pelt, Jack Kohler, Thomas V. Schuler**  
Simulating climatic mass balance, seasonal snow development and associated freshwater runoff in the Kongsfjord basin, Svalbard (1980–2016)
- 957 **Vjêran Višnjević, Frédéric Herman, Yury Podladchikov**  
Reconstructing spatially variable mass balances from past ice extents by inverse modeling
- 969 **J. W. Sanders, K. M. Cuffey, K. R. MacGregor, J. L. Kavanaugh, C. F. Dow**  
Variations in the surface velocity of an alpine cirque glacier
- 977 **Stanislav Kutuzov, Lonnie G. Thompson, Ivan Lavrentiev, Lide Tian**  
Ice thickness measurements of Guliya ice cap, western Kunlun Mountains (Tibetan Plateau), China
- 990 **Florent Domine, Maria Belke-Brea, Denis Sarrazin, Laurent Arnaud, Mathieu Barrere, Mathilde Poirier**  
Soil moisture, wind speed and depth hoar formation in the Arctic snowpack
- 1003 **Guangjian Wu, Peilin Li, Xuelei Zhang, Chenglong Zhang**  
Using a geochemical method of dissolved and insoluble fractions to characterize surface snow melting and major element elution
- 1014 **Anna Ruth W. Halberstadt, Lauren M. Simkins, John B. Anderson, Lindsay O. Prothro, Philip J. Bart**  
Characteristics of the deforming bed: till properties on the deglaciated Antarctic continental shelf