

QUATERNARY RESEARCH

Quaternary Research is an international journal devoted to the advancement of the interdisciplinary understanding of the Quaternary Period. We aim to publish articles of broad interest with relevance to more than one discipline, and that constitute a significant new contribution to Quaternary science. The journal's scope is global, building on its nearly 50-year history in advancing the understanding of earth and human history through interdisciplinary study of the last 2.7 million years. Research areas include geoarcheology, geochemistry and geophysics, geochronology, geomorphology, glaciology, neotectonics, paleobotany and paleoecology, paleoclimatology, paleogeography, paleohydrology, paleontology, paleoceanography, paleopedology, Quaternary geology, volcanology and tephrochronology.

Submit manuscripts online at <http://editorialmanager.com/qr>. See instructions for submitting your manuscripts at <https://www.cambridge.org/core/journals/quaternary-research/information/guide-for-authors>.

Subscription Information: *Quaternary Research* published two volumes per year with three issues each. The journal is published on behalf of Quaternary Research Center by Cambridge University Press, One Liberty Plaza, 20th Floor, New York, NY 10006, USA. Annual subscription rates for Volumes 91 and 92 (2019): Institutional rate, print only: \$1,447.00 (£1026.00 + VAT). Institutional rate, online only: \$1,420.00 (£1008.00 + VAT). Institutional rate, print and online: \$1,506.00 (£1070.00 + VAT). For subscriptions, renewals, and address changes, please visit <https://www.cambridge.org/core/journals/quaternary-research/subscribe>. Email subscriptions_newyork@cambridge.org if you are in the Americas or journals@cambridge.org for the rest of the world.

ISSN: 0033-5894

EISSN: 1096-0287

© 2019 University of Washington. All rights reserved.

No part of this publication may be reproduced, in any form or by any means, electronic, photocopying, or otherwise, without permission in writing from Cambridge University Press. Policies, request forms and contracts are available at: <http://www.cambridge.org/about-us/rights-permissions>. Permission to copy (for users in the U.S.A.) is available from Copyright Clearance Center: <http://www.copyright.com>. Email: info@copyright.com

CONTENTS



RESEARCH ARTICLES

- 609–625** **A 16,000-yr-long sedimentary sequence from Lakes Peters and Schrader (Neruoqpuq Lakes), northeastern Brooks Range, Alaska**
Christopher W. Benson, Darrell S. Kaufman, Nicholas P. McKay, Erik Schieffer and David Fortin
- 626–640** **New fossil sea turtle trackway morphotypes from the Pleistocene of South Africa highlight role of ichnology in turtle paleobiology**
Martin G. Lockley, Hayley C. Cawthra, Jan C. De Vynck, Charles W. Helm, Richard T. McCrea and Ronel Nel
- 641–664** **Age and development of active cryoplanation terraces in the alpine permafrost zone at Svartkampan, Jotunheimen, southern Norway**
John A. Matthews, Peter Wilson, Stefan Winkler, Richard W. Mournie, Jennifer L. Hill, Geraint Owen, John F. Hiemstra, Helen Hallang and Andrew P. Geary
- 665–685** **Multiproxy ecosystem response of abrupt Holocene climatic changes in the northeastern Mediterranean sedimentary archive and hydrologic regime**
Christina Giamali, Eftēpi Koskeridou, Assimina Antonarakou, Chryssanthi Ioakim, George Kontakiotis, Aristomenis P. Karageorgis, Grigoris Roussakis and Vassilis Karakitsios
- 686–707** **Neolithic population crash in northwest Europe associated with agricultural crisis**
Sue Colledge, James Conolly, Enrico Crema and Stephen Shennan
- 708–724** **Stratigraphic and geomorphologic evidence of three MIS 2 glacial advances in the South Fork Hoh River valley, Olympic Mountains, Washington, USA**
Cianna E. Wyschnydzky, Tammy M. Rittenour, Glenn D. Thackray and James Shulmeister
- 725–737** **East Asian summer monsoon climates and cave hydrological cycles over Dansgaard-Oeschger events 14 to 11 revealed by a new stalagmite record from Hulu Cave**
Yijia Liang, Yongjin Wang, Quan Wang, Jiangying Wu, Qingfeng Shao, Zhenqiu Zhang, Shaohua Yang, Xinggong Kong and R. Lawrence Edwards
- 738–753** **A southern and northern control on speleothem-based Asian summer monsoon variability during MIS 4**
Dianbing Liu, Shushuang Liu and Yifan Fang