



ISAES 2019

XIII International Symposium on Antarctic Earth Sciences

22 July (Mon) – 26 July (Fri) , 2019
Songdo Convensia, Incheon, Republic of Korea

PROGRAM BOOK



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Parallel Session (Wed)

- 7:00 **A420** Testing the Hotspot Hypothesis for Marie Byrd Land, West Antarctica Using Ice Penetrating Radar
Enrica Quartini University of Texas Institute for Geophysics, USA
- 7:15 **A413** Prominent Mantle Transition Zone Thinning Beneath the Central Transantarctic Mountains
Erica Emry New Mexico Tech, USA
- 7:30 **A265** Estimating Geothermal Heat Flux from Ice Sheet Borehole Temperature Measurements
Robert Mulvaney British Antarctic Survey, United Kingdom

(Wed), 15:00-17:30

Room #305

2 Emerging Frontiers in Satellite Remote Sensing and Geoinformation in Antarctic Earth Sciences: Cross-Disciplinary Advances
Convener: Peter Fretwell, Shridhar Jawak, Peter Convey, Simon Cox, Paul Morin

- 15:30 **A215** Bedmachine Antarctica V1: A New Subglacial Bed Topography and Ocean Bathymetry Dataset of Antarctica
Mathieu Morlighem University of California Irvine, USA
ynote
- 16:00 **A252** Release of the Continent-wide Dataset GeoMAP V.201907
Simon Cox GNS Science, New Zealand
ynote
- 0-16:30 **A339** Mass Balance of Antarctic Ice Sheet Based on Cryosat-2 from 2011-2018
Chang-qing Ke Nanjing University, China
ynote
- 0-16:45 **A293** Change Detection Over the Major Ice Shelves of Antarctica Using Radarsat and Sentinel Data
Esha Shah Gujarat University, India
- 5-17:00 **A137** Observing the Cryosphere with Next Generation Gns-Reflectometry
Brandi Downs The Ohio State University, USA
- 10-17:15 **A023** Mapping Poorly Exposed Lithologies Using Landsat-8 and Aster Satellite Data in Antarctic Peninsula
Amin Beiranvand Pour Korea Polar Research Institute, Korea
- 15-17:30 **A360** High-resolution Remote Sensing Techniques for Monitoring Penguin Colonies in the Ross Sea, Antarctica
Changuk Hyun Korea Polar Research Institute, Korea

Parallel Session (Thu)

July 25 (Thu), 10:30-12:30

2F, Grand Ballroom A

S14-I Marine Sedimentary Records of Antarctic Ice-Sheet Dynamics and Southern Ocean History during the Late Cainozoic

Convener: Claus-Dieter Hillenbrand, Jaeil Lee, Gerhard Kuhn

- 10:30-11:00 **A148** Early Resumption of Dense Shelf Water Production during the Past Deglaciations
Taryn Noble University of Tasmania, Australia
**Keynote*
- 11:00-11:15 **A190** Late Quaternary Carbonate Dissolution Cycle Recorded in Southern Drake Passage Sediments
Jaeil Lee Korea Polar Research Institute, Korea
- 11:15-11:30 **A061** Post-breakup Deposition Off Prydz Bay (East Antarctica) with Focus on Cenozoic Environments
German Leitchenkov Research Institute for Geology and Mineral Resources of the World Ocean, Russia
- 11:30-11:45 **A209** Continuous Late Miocene to Present Records on West Antarctic Ice Sheet Dynamics: Summary of IODP Expedition 379 to the Amundsen Sea
Karsten Gohl Alfred Wegener Institute for Polar and Marine Research, Germany
- 11:45-12:00 **A193** Iceberg Alley and South Falkland Slope Ice and Ocean Dynamics
Yasmina M Martos NASA Goddard Space Flight Center/University of Maryland, USA
- 12:00-12:30 **A213** Paleoclimatographic Changes in the Southern Ocean Off Elephant Island Since the Last Glacial Maximum
Sunghan Kim Korea Polar Research Institute, Korea
**Keynote*

July 25 (Thu), 10:30-12:30

Room #302

S02-III Structure, Evolution, and Heterogeneity of Antarctica's Continental Lithosphere

Convener: J. Jacobs, F. Ferraccioli, Andreas Laeuffer, N. Pant, E. Emry, S. Hansen

- 10:30-11:00 **A394** Achievements and Aspirations of AWI Airborne Geophysics in Antarctica
Graeme Eagles Alfred Wegener Institute, Germany
**Keynote*
- 11:00-11:15 **A347** Lithospheric Magnetic Anomaly Modelling from Antarctic Near-surface and Satellite Observations
Hyungrae Kim Kongju National University, Korea
- 11:15-11:30 **A116** Crustal Evolution of the Archean Napier Complex
Simon Wilde Curtin University, Australia
- 11:30-11:45 **A049** The Early Mesoproterozoic Filla Series in the Rauer Islands: A Possible Fragment of the Long-lived Fraser-Fisher-Ongole Oceanic Realm
Evgenii Mikhalskii VNIIOkeangeologia, Russia

Late Quaternary carbonate dissolution cycle recorded in southern Drake Passage sediments

Jae Il Lee, Kyu-Cheul Yoo, Sunghan Kim, Min Kyung Lee, Heung Soo Moon, Yong Hee Park

Abstract

Changes in deep sea carbonate chemistry might have played an important role in controlling the glacial-interglacial variation in atmospheric carbon dioxide ($p\text{CO}_2$) concentration. However, contribution of deep ocean to glacial-interglacial $p\text{CO}_2$ variation is still elusive, partly due to deficiency of carbonate data in critical regions such as those proximal to the source of global deep water. Here we present the carbonate content of six gravity cores from 2710 to 4090 m water depths of the southern Drake Passage (SDP). A gravity core from 2710 m contains carbonate of 16 to 63%, and shows high-carbonate interglacial and low-carbonate glacial pattern, reflecting higher primary carbonate productivity during interglacial periods. The other SDP cores from deeper water depths, however, contain much lower carbonate of 0 to 26%, and are characterized by virtually no carbonate during interglacial periods for the last ~800 kyr. This difference in glacial-interglacial carbonate variability pattern among different water depths suggests that dissolution of carbonate on the seafloor has been more intense during interglacial periods than glacial periods during the late Quaternary in the SDP. We interpret this is due to highly corrosive nature of interglacial deep water originated from the Weddell Sea. Oceans bathed by the deep water originated from the Weddell Sea and probably from the Antarctic margins should have been affected by the corrosive interglacial deep water, and the so-called 'Pacific-type' carbonate pattern of low carbonate interglacial and high carbonate glacial periods can be made in those regions. This study emphasizes the active role of Antarctic-sourced deep water, especially during interglacial periods, in controlling deep sea carbonate saturation state. Wider shelf area and more extensive ice shelves in interglacial periods compared with glacial periods might have facilitated the production of corrosive deep water in the Antarctic margin.