

Contents

Introduction	ix
The Last Antarctic Journal Karl A. Erb	
Aeronomy and Astrophysics	
A ground-satellite study of the impact of solar wind variations on Pc 1 and 2 pulsations in the outer dayside magnetosphere	1
Mark Engebretson, Roger Arnoldy, and Brian Anderson	
WHOOOPS: An improved rooftop optical shelter	6
K.C. Clark and G. Hernandez	
Broad diffuse source for optical intensity calibration	9
K.C. Clark and G. Hernandez	
Marine and Terrestrial Biology	
Invertebrate diversity in Taylor Valley soils and sediments	13
Amy M. Treonis, Diana H. Wall, and Ross A. Virginia	
Filtration volume and retention of carbon -14 particulate organic carbon on GF/F filters during a <i>Phaeocystis antarctica</i> bloom in the Ross Sea, Antarctica	17
C.A. Carlson, D.A. Hansell, and W.O. Smith	
The chemistry of the Ross Sea in the austral spring.	22
Frank J. Millero, Louis I. Gordon, Louis A. Codispoti, and John M. Morrison	
Bio-optical measurements and modeling within the Southern Ocean	29
Rick A. Reynolds, Dariusz Stramski, John D. Wieland, and B. Greg Mitchell	
Distribution of invertebrate larvae in relation to physical structure and UVB-light intensity in the water column off Anvers Islands, Antarctic Peninsula	33
Isidro Bosch, Deneb Karentz, and William B. Jaeckle	
Bacteria-algae associations in the sea ice and upper water column of the Ross Sea in late austral summer	38
Frank Stewart, Christian H. Fritsen, and David L. Garrison	
Viruses infecting algae and protozoans in Ross Sea winter ice communities	42

Marcia M. Gowing, Blake E. Riggs, and Cynthia Venn	
Secondary metabolite biosynthesis at ambient temperature in an antarctic sponge-derived bacterium, <i>Pseudomonas aeruginosa</i>	47
Michael C.L. Vickery, Charles D. Amsler, James B. McClintock, and Bill J. Baker	
The temporal cycle of the phytoplankton biomass and primary productivity in the Ross Sea, Antarctica	51
Walker O. Smith, Jr., Richard T. Barber, Michael Hiscock, and John Marra	
Onset of the <i>Phaeocystis</i> Bloom in the Ross Sea: Flagellate versus colony abundance and biomass	55
Sylvie Mathot and Walker O. Smith, Jr.	
AESOPS: Effects of iron addition on nutrient depletion and nitrogen uptake rates in an offshore region of the Ross Sea	59
Deborah A. Bronk, Benjamin R. Wheeler, II, William P. Cochlan, Kenneth H. Coale, and Steven E. Fitzwater	
AESPOS: Ammonium uptake kinetics in the Ross Sea, Antarctica	63
William P. Cochlan, Julian Herndon, and Deborah A. Bronk	
Investigations of Weddell seal (<i>Leptonychotes weddellii</i>) populations in McMurdo Sound, 1998-2000	69
Michael F. Cameron, Thomas S. Gelatt, and Donald B. Siniff	
The C.L.I.M.A. Project activities and objectives in the Pacific sector of the Southern Ocean	75
Alessandra Accornero, Enrico Zambianchi, and Giocarlo Spezie	
U.S. Antarctic Marine Living Resources Program	
The U.S. Antarctic Marine Living Resources (AMLR) program: 1997-1998 field season activities	79
Jane E. Martin, Roger P. Hewitt, and Rennie S. Holt	
AMLR program: Temporal and spatial variability of antarctic krill density near South Shetland Islands as estimated from acoustic surveys	83
Roger P. Hewitt and David A. Demer	
AMLR program: Chlorophyll-<i>a</i> concentrations in the area around South Shetland Islands and Elephant Island, January to March 1998	90
C.D. Hewes, M. Ruiz, M. Frangopulos, J. Maturana, and O. Holm-Hansen	
AMLR program: Inorganic nutrient concentrations in the area around South Shetland Islands and Elephant Island, January 1998	96
J. Maturana, N. Silva S., C.D. Hewes, and O. Holm-Hansen	

AMLR program: Krill populations in the Elephant Island area, January and February 1998	101
Valerie Loeb	
AMLR program: The zooplankton assemblage sampled during austral summer 1998 compared to those sampled in 1993 to 1997	107
Valerie Loeb, Volker Siegel, Wesley A. Armstrong	
AMLR program: Physical oceanography of the Elephant Island area, summer 1998	115
A.F. Amos, A.R. Wickham, and C.C. Rowe	
AMLR program: An unusual South Shetlands weather event	119
Anthony F. Amos	
AMLR program: Linking prey distribution and abundance with reproductive success in antarctic fur seals; foraging range and diet of females rearing pups	125
Michael E. Goebel, Daniel P. Costa, Jeremy T. Sterling, and Daniel E. Crocker	
AMLR program: Standing stock biomass of six species of finfish around Elephant Island and the lower South Shetland Islands from the 1998 U.S. AMLR bottom trawl survey	129
Christopher D. Jones, Karl-Hermann Kock, and Sunhild Wilhelms	
The U.S. Antarctic Marine Living Resources (AMLR) program: 1998-1999 field season	134
Jane E. Martin, Roger P. Hewitt, and Rennie S. Holt	
AMLR program: Salps and other zooplankton in the Elephant Island area during austral summer 1999	139
Valerie Loeb and Wesley A. Armstrong	
AMLR program: Evidence for continued decline in krill biomass density from acoustic surveys conducted in the vicinity of the South Shetland Islands during the 1998-1999 austral summer	146
Roger P. Hewitt and David A. Demer	
AMLR program: Standing stock biomass of eight species of finfish around the South Orkney Islands	152
Christopher D. Jones	
AMLR program: Krill abundance and population structure in the Elephant Island area, January and February 1999	158
Valerie Loeb	
AMLR program: Foraging range and daily traveling distance of antarctic fur seals, Cape Shirreff, Livingston Island, Antarctica	165
Michael E. Goebel, Daniel P. Costa, Matthew R. Rutishauer, and Jeremy	

T. Sterling	
AMLR program: Temporal aspects of phytoplankton distribution and abundance in waters around Elelphant Island, Antarctica, summer 1999	169
C.D. Hewes, O. Holm-Hansen, S.B. Giglio Munoz, V.E. Chacon Chade, and H.R. Wellman	
AMLR program: Inorganic nutrient concentrations in the Elelphant Island area in relation to different water zones	174
N. Silva, G.A. Cuevas, S. B. Giglio-Munoz, and O. Holm-Hansen	
AMLR program: Primary production and photophysiological state of the phytoplankton, summer 1999	178
O. Holm-Hansen, C.D. Hewes, and M. Ruiz	
AMLR program: Phytoplankton size class distributions and their relationship to different water zones, January to February 1999	184
C.D. Hewes, O. Holm-Hansen, G. A. Cuevas, and E. Guzman	
AMLR program: Physical oceanography of the northern South Shetland Island and Bransfield Strait area, summer 1999	189
A.F. Amos	
AMLR program: Seabird research at Cape Shirreff, Livingston Island, Antarctica 1998-1999	194
W.Z. Trivelpiece, T.M. Carten, and R.S. Holt	
 Palmer Long Term Ecological Research Program	
Palmer LTER: Annual January cruise for 1998 (LMGR98-8; LMG98-1)	197
David M. Karl, Langdon B. Quetin, and Karen S. Baker	
Palmer LTER: 1997 seasonal air temperature in context	203
Karen S. Baker	
Palmer LTER: Annual season sampling at Palmer Station, November 1997—March 1998	207
Karen S. Baker, Wendy A. Kozlowski, Maria Vernet, Janice L. Jones, Langdon B. Quetin, Robin M. Ross, Raymond C. Smith, and William R. Fraser	
Palmer LTER: 1997 seasonal sea-ice variability in context	213
Sharon E. Stammerjohn, Raymond C. Smith, and Karen S. Baker	
Palmer LTER: Annual January Cruise for 1999 (LMG99-1)	219
Robin Ross and Karen Baker	
Palmer LTER: Annual season sampling at Palmer Station, October	226

1998-April 1999

Karen S. Baker, Wendy A. Kozlowski, Maria Vernet, Karen W. Patterson, Langdon B. Quetin, Robin M. Ross, Raymond C. Smith, and William R. Fraser

Palmer LTER: Seasonal process sea-ice cruise, June-July 1999 (NBP99-06) 235

Ray Smith and Sharon Stammerjohn

Palmer LTER: Microscopic analysis of ice assemblages in new-year sea ice in the Western Antarctic Peninsula, June-July 1999 242

M.E. Ferrario, I. Garibotti, and M. Vernet

Palmer LTER: Teacher Experiencing Antarctica, January 1998 245

Besse Dawson, Karen S. Baker, and David M. Karl

Ocean and Climate Sciences

Cape Denison, eastern Antarctica: The windiest place on Earth 249

Gerd Wendler and Uwe Radok

High levels of ultraviolet radiation observed in November 1998 at Amundsen-Scott South Pole Station 255

German Bernhard, Charles R. Booth, and James C. Ehramjian

Temporal and spatial variability of particulate matter in the Ross Sea, spring-fall 1996-1997 259

Wilford D. Gardner and Mary Richardson

Thorium fluxes and carbon export from the Ross Sea: A preliminary report 262

Lary A. Ball, John E. Andrews, and Ken O. Buesseler

U.S.-China collaborative research program on particulate organic matter export in the southern Indian Ocean, East Antarctica 267

Cynthia H. Pilskaln, Vernon S. Asper, and Steven J. Manganini

Geology and Geophysics

Early Triassic fossil plants from the Transantarctic Mountains 272

Gregory J. Retallack

The Kerguelen Archipelago: A 40-million-year record of volcanism derived from the Kerguelen Mantle Plume 278

Frederick A. Frey, Kirsten Nicolaysen, and Dominique Weis

Geodetic field work in 1998 at Palmer Station, Antarctica 284

Gunter Reppchen

Magnetic properties of a sediment core from Andvord Drift Emily K. Youcha and Stefanie Brachfeld	289
Rock-magnetic analysis of sediments from Andvord Bay Stefanie Brachfeld	294
Magnetic granulometry of igneous and meta-sedimentary rocks from northern Graham Land, Antarctic Peninsula Stefanie Brachfeld, Anne Grunow, and Emily K. Youcha	298
Laminations from the Palmer Deep, Antarctica Athanasios Barkoukis and Amy Leventer	304
Annual cycles in Palmer Deep sediments, Antarctica Beth McAndrews, Amy Leventer, and Eugene Domack	309
The riddle of subglacial lithologies in the West Antarctic Rift System Wesley LeMasurier	314
Crustal structure and Cenozoic tectonics on the eastern margin of the Ross Sea, Marie Byrd Land Christine Smith Siddoway and Bruce P. Luyendyk	318
Open-system degassing of fractionating magma, Mount Erebus, Ross Island A.J. Eschenbacher, P.R. Kyle, and J.B. Lowenstern	323
New Holocene $^{40}\text{Ar}/^{39}\text{Ar}$ dates on Mount Erebus summit plateau lava flows Christopher J. Harpel, Philip R. Kyle, and W.C. McIntosh	326
Broadband seismic recording of strombolian explosions at Mount Erebus C.A. Rowe, R.C. Aster, and P.R. Kyle	330
Seismic observations at the Mount Erebus observatory: 1997-1998 C.A. Rowe, R.C. Aster, P.R. Kyle, and A. Eschenbacher	335
Volcanic carbon-dioxide emissions from Mount Erebus L.J. Wardell and P.R. Kyle	340
Preliminary investigation of the secondary minerals in the Kirkpatrick Basalt, Prince Albert Mountains C.H. Conaway, T.H. Fleming, and D.H. Elliot	344
A report of the field surveys for the Transantarctic Mountains Aerogeophysical Research Activities (TAMARA) program Carol Finn, Detlef Damaske, and Terry Wilson	348
Testing the SWEAT hypothesis and studying Neoproterozoic-Cambrian deformation in the Nimrod Glacier area, central Transantarctic Mountains	351

John Encarnacion, Timothy Paulsen, and Michael Watkeys	
Origin of carbonates in Martian meteorite Allan Hills 84001	357
Edward R.D. Scott and Alexander N. Krot	
Claystone breccias at the Permian-Triassic boundary in Antarctica	361
Gregory J. Retallack	
Alluvial architecture of the Feather Conglomerate, southern Victoria Land	367
Gregory J. Retallack	
Uranium-234/Thorium-230 dates of lacustrine carbonates at Lake Vida: Implications for the radiocarbon reservoir effect	371
Brenda Hall and Gideon M. Henderson	
Antarctic mapping, geodesy, GIS and the U.S. Antarctic Resource Center (USARC)	375
Tony K. Meunier and Jerry L. Mullins	
Glaciology	
Glaciochemical differentiation of air masses entering Siple Dome, West Antarctica	378
Paul A. Mayewski and Karl J. Kreutz	
Snow microstructure for snow-air exchange processes at Siple Dome, Antarctica	382
Mary R. Albert	
Changes in the Filchner-Ronne Ice Shelf since 1957	386
John C. Behrendt, Ted A. Scambos, and Nola B. Aughenbaugh	