

Contents

Foreword.....	v
Arctic–Subarctic Ocean Fluxes: Defining the Role of the Northern Seas in Climate. A General Introduction.....	1
Bob Dickson, Jens Meincke, and Peter Rhines	
1 The Inflow of Atlantic Water, Heat, and Salt to the Nordic Seas Across the Greenland–Scotland Ridge.....	15
Bogi Hansen, Svein Østerhus, William R. Turrell, Steingrímur Jónsson, Héðinn Valdimarsson, Hjálmar Hátún, and Steffen Malskær Olsen	
2 Volume and Heat Transports to the Arctic Ocean Via the Norwegian and Barents Seas.....	45
Øystein Skagseth, Tore Furevik, Randi Ingvaldsen, Harald Loeng, Kjell Arne Mork, Kjell Arild Orvik, and Vladimir Ozhigin	
3 Variation of Measured Heat Flow Through the Fram Strait Between 1997 and 2006	65
Ursula Schauer, Agnieszka Beszczynska-Möller, Waldemar Walczowski, Eberhard Fahrbach, Jan Piechura, and Edmond Hansen	
4 Is Oceanic Heat Transport Significant in the Climate System?.....	87
Peter Rhines, Sirpa Häkkinen, and Simon A. Josey	
5 Long-Term Variability of Atlantic Water Inflow to the Northern Seas: Insights from Model Experiments.....	111
Michael Karcher, Ruediger Gerdes, and Frank Kauker	

6 Climatic Importance of Large-Scale and Mesoscale Circulation in the Lofoten Basin Deduced from Lagrangian Observations	131
Jean-Claude Gascard and Kjell Arne Mork	
7 Freshwater Storage in the Northern Ocean and the Special Role of the Beaufort Gyre.....	145
Eddy Carmack, Fiona McLaughlin, Michiyo Yamamoto-Kawai, Motoyo Itoh, Koji Shimada, Richard Krishfield, and Andrey Proshutinsky	
8 Modelling the Sea Ice Export Through Fram Strait.....	171
Torben Koenigk, Uwe Mikolajewicz, Helmuth Haak, and Johann Jungclaus	
9 Fresh-Water Fluxes via Pacific and Arctic Outflows Across the Canadian Polar Shelf.....	193
Humfrey Melling, Tom A. Agnew, Kelly K. Falkner, David A. Greenberg, Craig M. Lee, Andreas Münchow, Brian Petrie, Simon J. Prinsenberg, Roger M. Samelson, and Rebecca A. Woodgate	
10 The Arctic–Subarctic Exchange Through Hudson Strait	249
Fiammetta Straneo and François J. Saucier	
11 Freshwater Fluxes East of Greenland	263
Jürgen Holfort, Edmond Hansen, Svein Østerhus, Stephen Dye, Steingrimur Jonsson, Jens Meincke, John Mortensen, and Michael Meredith	
12 The Changing View on How Freshwater Impacts the Atlantic Meridional Overturning Circulation.....	289
Michael Vellinga, Bob Dickson, and Ruth Curry	
13 Constraints on Estimating Mass, Heat and Freshwater Transports in the Arctic Ocean: An Exercise.....	315
Bert Rudels, Marika Marnela, and Patrick Eriksson	
14 Variability and Change in the Atmospheric Branch of the Arctic Hydrologic Cycle	343
Mark C. Serreze, Andrew P. Barrett, and Andrew G. Slater	

15 Simulating the Terms in the Arctic Hydrological Budget.....	363
Peili Wu, Helmuth Haak, Richard Wood, Johann H. Jungclaus, and Tore Furevik	
16 Is the Global Conveyor Belt Threatened by Arctic Ocean Fresh Water Outflow?.....	385
E. Peter Jones and Leif G. Anderson	
17 Simulating the Long-Term Variability of Liquid Freshwater Export from the Arctic Ocean.....	405
Rüdiger Gerdes, Michael Karcher, Cornelia Köberle, and Kerstin Fieg	
18 The Overflow Transport East of Iceland	427
Svein Østerhus, Toby Sherwin, Detlef Quadfasel, and Bogi Hansen	
19 The Overflow Flux West of Iceland: Variability, Origins and Forcing.....	443
Bob Dickson, Stephen Dye, Steingrímur Jónsson, Armin Köhl, Andreas Macrander, Marika Marnela, Jens Meincke, Steffen Olsen, Bert Rudels, Héðinn Valdimarsson, and Gunnar Voet	
20 Tracer Evidence of the Origin and Variability of Denmark Strait Overflow Water.....	475
Toste Tanhua, K. Anders Olsson, and Emil Jeansson	
21 Transformation and Fate of Overflows in the Northern North Atlantic	505
Igor Yashayaev and Bob Dickson	
22 Modelling the Overflows Across the Greenland–Scotland Ridge.....	527
Johann H. Jungclaus, Andreas Macrander, and Rolf H. Käse	
23 Satellite Evidence of Change in the Northern Gyre.....	551
Sirpa Häkkinen, Hjálmar Hátún, and Peter Rhines	
24 The History of the Labrador Sea Water: Production, Spreading, Transformation and Loss	569
Igor Yashayaev, N. Penny Holliday, Manfred Bersch, and Hendrik M. van Aken	

25 Convective to Gyre-Scale Dynamics: Seaglider Campaigns in the Labrador Sea 2003–2005.....	613
Charles C. Eriksen and Peter B. Rhines	
26 Convection in the Western North Atlantic Sub-Polar Gyre: Do Small-Scale Wind Events Matter?	629
Robert S. Pickart, Kjetil Våge, G.W.K. Moore, Ian A. Renfrew, Mads Hvid Rønne, and Huw C. Davies	
27 North Atlantic Deep Water Formation in the Labrador Sea, Recirculation Through the Subpolar Gyre, and Discharge to the Subtropics	653
Thomas Haine, Claus Böning, Peter Brandt, Jürgen Fischer, Andreas Funk, Dagmar Kieke, Erik Kvaleberg, Monika Rhein, and Martin Visbeck	
28 Accessing the Inaccessible: Buoyancy-Driven Coastal Currents on the Shelves of Greenland and Eastern Canada	703
Sheldon Bacon, Paul G. Myers, Bert Rudels, and David A. Sutherland	
List of Contributors.....	723
Index.....	731