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## ISRAEL EMERSON

[Glacial Geology](#) Academic Press

Antarctic Climate Evolution is the first book dedicated to furthering knowledge on the evolution of the world's largest ice sheet over its ~34 million year history. This volume provides the latest information on subjects ranging from terrestrial and marine geology to sedimentology and glacier geophysics. - An overview of Antarctic climate change, analyzing historical, present-day and future developments - Contributions from leading experts and scholars from around the world - Informs and updates climate change scientists and experts in related areas of study

[Glaciers and Ice Sheets in the Climate System](#) John Wiley & Sons

The Physics of Glaciers, Fourth Edition, discusses the physical principles that underlie the behavior and characteristics of glaciers. The term glacier refers to all bodies of ice created by the accumulation of snowfall, e.g., mountain glaciers, ice caps, continental ice sheets, and ice shelves. Glaciology—the study of all forms of ice—is an interdisciplinary field encompassing physics, geology, atmospheric science, mathematics, and others. This book covers various aspects of glacier studies, including the transformation of snow to ice, grain-scale structures and ice deformation, mass exchange processes, glacial hydrology, glacier flow, and the impact of climate change. The present edition features two new chapters: "Ice Sheets and the Earth System and "Ice, Sea Level, and Contemporary Climate Change. The chapter on ice core studies has been updated from the previous version with new material. The materials on the flow of mountain glaciers, ice sheets, ice streams, and ice shelves have been combined into a single chapter entitled "The Flow of Ice Masses. - Completely updated and revised, with 30% new material including climate change - Accessible to students, and an essential guide for researchers - Authored by preeminent glaciologists

[Physics of Glaciers](#) Cambridge University Press

Ice humanities is a pioneering collection of essays that tackles the existential crisis posed by the planet's diminishing ice reserves. By the end of this century, we will likely be facing a world where sea ice no longer reliably forms in large areas of the Arctic Ocean, where glaciers have not just retreated but disappeared, where ice sheets collapse, and where permafrost is far from permanent. The ramifications of such change are not simply geophysical and biochemical. They are societal and cultural, and they are about value and loss. Where does this change leave our inherited ideas, knowledge and experiences of ice, snow, frost and frozen ground? How will human, animal and plant communities superbly adapted to cold and high places cope with less ice, or even none at all? The ecological services provided by ice are breath-taking, providing mobility, water and food security for hundreds of millions of people around the world, often Indigenous and vulnerable communities. The stakes could not be higher. Drawing on sources ranging from oral testimony to technical scientific expertise, this path-breaking collection sets out a highly compelling claim for the emerging field of ice humanities, convincingly demonstrating that the centrality of ice in human and non-human life is now impossible to ignore.

[Glaciers and Ice Sheets in the Climate System](#) Guyer Partners

According to my latest model for the last glacial maximum (LGM) (Grosswald 1988), the Arctic continental margin of Eurasia was glaciated by the Eurasian ice sheet, which consisted of three interconnected ice domes --the Scandinavian, Kara, and East Siberian. The Kara Sea glacier was largely a marine ice dome grounded on the sea's continental shelf. The ice dome discharged its ice in all directions, northward into the deep Arctic Basin, southward and westward onto the mainland of west-central North Siberia, the northern Russian Plain, and over the Barents shelf into the Norwegian-Greenland Sea On the Barents shelf, the Kara ice dome merged with the Scandinavian ice dome. In the Arctic Basin the discharged ice floated and eventually coalesced with the floating

glacier ice of the North-American provenance giving rise to the Central-Arctic ice shelf. Along its southern margin, the Kara ice dome impounded the northward flowing rivers, causing the formation of large proglaciallakes and their integration into a transcontinental meltwater drainage system. Despite the constant increase in corroborating evidence, the concept of a Kara ice dome is still considered debatable, and the ice dome itself problematic. As a result, a paleogeographic uncertainty takes place, which is aggravated by the fact that a great deal of existing knowledge, no matter how broadly accepted, is based on ambiguous interpretations of the data, most of which are published in Russian and, therefore, not easily available to western scientists.

[Colour Atlas of Glacial Phenomena](#) Elsevier

Introductory technical guidance for civil and structural engineers interested in the bearing capacity of ice sheets. Here is what is discussed: 1. INTRODUCTION 2. BEARING CAPACITY OF ICE BLOCKS 3. BEARING CAPACITY OF FLOATING ICE SHEETS 4. ANALYTICAL METHODS FOR SHORT-TERM LOADS 5. EMPIRICAL METHODS FOR SHORT-TERM LOADS 6. MOVING LOADS 7. LONG-TERM LOADS.

[The Climatic Record in Polar Ice Sheets](#) Springer Science & Business Media

Considering that glaciers and ice sheets cover about 10% of the Earth's land surface in a world where human civilization is increasingly impacted by the effects of changing glacial activity, Colour Atlas of Glacial Phenomena presents itself as an indispensable guide for students, professionals, and researchers who want to be better informed while studying and tracking the future influences of glaciers and ice sheets on the global environment. While stressing both the beauty and utility of glaciers, the authors cover critical features of glaciers and their landforms and provide useful explanations of the key concepts in glaciology and glacial geology. The authors expand to demonstrate how our lives are influenced by the Cryosphere, a key component of the Earth system and how this heightens the vulnerability of glaciers and ice sheets to deterioration. This illustrated book also helpfully maps out regions of mountain glaciers and ice caps around the world for a practical reference and discusses the products of glacial erosion and deposition integral to understanding rising global sea levels.

[Ice in the Climate System](#) Springer Science & Business Media

Explains the physical principles underlying the behaviour of glaciers and ice sheets and concludes with a chapter on the information about past climate and atmospheric composition obtainable from ice cores. The past 40 years have seen major advances in most aspects of the subject; the book concentrates on these. It is an updated and expanded version of the second edition, and is now available in the long-awaited paperback format. Much of the book deals with developments since the second edition was published. Dr Paterson's introduction to glacier studies was with the British First Greenland Expedition in 1953-4. He emigrated to Canada in 1957 and between 1959 and 1980 studied glaciers in the Canadian Arctic and the Rocky Mountains, mainly under the auspices of the Canadian Government's Polar Continental Shelf Project. Since 1980 he has done consulting work and has also been a visiting scientist with the Geophysics Department at the University of Copenhagen (three times) and with the Australian Antarctic Division. He has also given a comprehensive lecture course at the Institute of Glaciology and Geocryology in Lanzhou, China. He is now retired (more or less) and lives in British Columbia. New paperback edition of a classic text Well-known and respected author Updated and expanded since the second edition, reflecting the advances in most aspects of the subject over the last 40 years

[Theoretical Glaciology](#) Nova Snova

The new Second Edition of Glacial Geology provides a modern, comprehensive summary of glacial geology and geomorphology. It is has been thoroughly revised and updated from the original First Edition. This book will appeal to all students interested in the landforms and sediments that make up glacial landscapes. The aim of the book is to outline glacial landforms and sediments and to provide the reader with the tools required to interpret glacial landscapes. It describes how glaciers work and

how the processes of glacial erosion and deposition which operate within them are recorded in the glacial landscape. The Second Edition is presented in the same clear and concise format as the First Edition, providing detailed explanations that are not cluttered with unnecessary detail. Additions include a new chapter on Glaciations around the Globe, demonstrating the range of glacial environments present on Earth today and a new chapter on Palaeoglaciology, explaining how glacial landforms and sediments are used in ice-sheet reconstructions. Like the original book, text boxes are used throughout to explain key concepts and to introduce students to case study material from the glacial literature. Newly updated sections on Further Reading are also included at the end of each chapter to point the reader towards key references. The book is illustrated throughout with colour photographs and illustrations.

**Glacial Geology - Ice Sheets, Glaciers and Landforms** Springer Science & Business Media  
Melt takes place where the surface of glaciers or ice sheets interacts with the atmosphere. While the processes governing surface melt are fairly well understood, the pathways of the meltwater, from its origin to the moment it leaves a glacier system, remain enigmatic. It is not even guaranteed that meltwater leaves a glacier or ice sheet. On Greenland, for example, only slightly more than 50% of the meltwater runs off. The remainder mostly refreezes within the so-called firn cover of the ice sheet. This eBook contains 11 studies which tackle the challenge of understanding meltwater retention in snow and firn from various angles. The studies focus both on mountain glaciers and on the Greenland ice sheet and address challenges such as measuring firn properties, quantifying their influence on meltwater retention, modelling firn processes and meltwater refreezing as well as unravelling the mechanisms within the recently discovered Greenland firn aquifers.

**Dynamics of Snow and Ice Masses** Springer Nature

Big blocks of ice that have built up on Earth over millions of years are shrinking. What's happening to them? Climate change is making things hotter, causing massive melting of Earth's ice sheets. Explore this concerning topic with easy-to-understand content tied to the curriculum of upper-elementary and middle school students and text written at a 2nd to 3rd grade reading level. Dyslexia-friendly font and design make learning accessible, and a recap at the end promotes checking for understanding to aid comprehension. It's key environmental science curriculum made approachable for all.

**Climate Change: Ice Sheets Melt and Changes in the Arctic** Manchester University Press  
Chapter 1 focuses on the science to understand the physical processes and projections of mass loss of the major ice sheets in Greenland and Antarctica, as well as of mountain and other land-based glaciers. The chapter reports on current projections of glacier mass loss due to anthropogenic climate change, and in turn how that will affect sea level. The diminishment of Arctic sea ice has led to increased human activities in the Arctic, and has heightened interest in, and concerns about, the region's future as reported in chapter 2. Issues such as Arctic territorial disputes; commercial shipping through the Arctic; Arctic oil, gas, and mineral exploration; endangered Arctic species; and increased military operations in the Arctic could cause the region in coming years to become an arena of international cooperation, tension, or competition.

**The Ice at the End of the World** Cambridge University Press

This multi-author work examines the glacial geology; measurement; temperature; and the climatic record from ice cores and other topics.

**Glaciers, Ice Sheets and Volcanoes** Springer Science & Business Media

The Arctic is thawing. In summer, cruise ships sail through the once ice-clogged Northwest Passage, lakes form on top of the Greenland Ice Sheet, and polar bears swim farther and farther in search of waning ice floes. At the opposite end of the world, floating Antarctic ice shelves are shrinking. Mountain glaciers are in retreat worldwide, unleashing flash floods and avalanches. We are on thin ice—and with melting permafrost's potential to let loose still more greenhouse gases, these changes may be just the beginning. Vanishing Ice is a powerful depiction of the dramatic transformation of the cryosphere—the world of ice and snow—and its consequences for the human world. Delving into the major components of the cryosphere, including ice sheets, valley glaciers, permafrost, and floating ice, Vivien Gornitz gives an up-to-date explanation of key current trends in the decline of ice mass. Drawing on a long-term perspective gained by examining changes in the cryosphere and corresponding variations in sea level over millions of years, she demonstrates the link between thawing ice and sea-level rise to point to the social and economic challenges on the horizon. Gornitz highlights the widespread repercussions of ice loss, which will affect countless people far removed from frozen regions, to explain why the big meltdown matters to us all. Written for all readers and students interested in the science of our changing climate, Vanishing Ice is an accessible and lucid warning of the coming thaw.

**The Physics of Glaciers** Butterworth-Heinemann

Polar Remote Sensing is a two-volume work providing a comprehensive, multidisciplinary discussion of the applications of satellite sensing. Volume 2 focuses on the ice sheets, icebergs, and interactions between ice sheets and the atmosphere and ocean. It contains information about the applications of satellite remote sensing in all relevant polar related disciplines, including glaciology, meteorology, climate and radiation balance and oceanography. It also provides a brief review of the state-of-the-art of each discipline, including current issues and questions. Various passive and active remote sensor types are discussed, and the book then concentrates on specific geophysical applications. Its interdisciplinary approach means that major advances and publications are highlighted. Polar Remote Sensing: Ice Sheets summarizes fundamental principles of detectors, imaging and geophysical product retrieval includes a chapter on the important new field of satellite synthetic-aperture radar interferometry is a "one stop shop" for polar remote sensing information contains significant new information on the Earth's polar regions describes sophisticated groundbased remote sensing applications with specific reference to their use in polar regions.

**Disappearing Ice Sheets** Oxford University Press, USA

Surveys atmospheric, oceanic and cryospheric processes, present and past conditions, and changes in polar environments.

**The West Antarctic Ice Sheet** Springer Science & Business Media

Our realisation of how profoundly glaciers and ice sheets respond to climate change and impact sea level and the environment has propelled their study to the forefront of Earth system science. Aspects of this multidisciplinary endeavour now constitute major areas of research. This book is named after the international summer school held annually in the beautiful alpine village of Karthaus, Northern Italy, and consists of twenty chapters based on lectures from the school. They cover theory, methods, and observations, and introduce readers to essential glaciological topics such as ice-flow dynamics, polar meteorology, mass balance, ice-core analysis, paleoclimatology, remote sensing and geophysical methods, glacial isostatic adjustment, modern and past glacial fluctuations, and ice sheet reconstruction. The chapters were written by thirty-four contributing authors who are leading international authorities in their fields. The book can be used as a graduate-level textbook for a university course, and as a valuable reference guide for practising glaciologists and climate scientists.

**Antarctic Climate Evolution** Frontiers Media SA

Contains background papers and summary group reports from a workshop concerned with the environmental records contained in the layered sequences of ice sheets and glaciers. Examines: a) how glaciers record and preserve environmental processes; b) establishing ice core chronology; c) anthropogenic impacts recorded in glaciers; d) ice-core record of long-term global changes in the environment.

**The Environmental Record in Glaciers and Ice** Springer Science & Business Media

A detailed and comprehensive overview of observational and modelling techniques for all climate change, environmental science and glaciology researchers.

**An Introduction to Bearing Capacity of Ice Sheets** Routledge

Dynamics of Snow and Ice Masses gives an outline of snow and ice studies with an emphasis on essential properties and processes. The monograph also treats the dynamical aspects of snow and ice masses. The text covers topics such as the flow and temperature of ice sheets and shelves, the numerical modeling of ice-sheet changes; the structure of glaciers, the experimental creep behavior of ice, flow law of glacier ice, and advance and retreat of glaciers. Also covered are topics such as sea ice - the physics of its growth, drift, and decay; iceberg deterioration, sources, drift, and drift patterns; and freshwater ice growth, motion, and decay. The book is recommended as a textbook for graduate-level students of snow and ice studies and as reference for climatologists.

**Dynamics of Ice Sheets and Glaciers** Wiley-Blackwell

Dynamics of Ice Sheets and Glaciers presents an introduction to the dynamics and thermodynamics of flowing ice masses on Earth. Based on an outline of general continuum mechanics, the different initial-boundary-value problems for the flow of ice sheets, ice shelves, ice caps and glaciers are systematically derived. Special emphasis is put on developing hierarchies of approximations for the different systems, and suitable numerical solution techniques are discussed. A separate chapter is devoted to glacial isostasy. The book is appropriate for graduate courses in glaciology, cryospheric sciences, environmental sciences, geophysics and related fields. Standard undergraduate knowledge of mathematics (calculus, linear algebra) and physics (classical mechanics, thermodynamics) provide a sufficient background for successfully studying the text.

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