

The Northern North Atlantic A Changing Environment 1st Edition

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Explore the critical environmental transformations occurring in the Northern North Atlantic, examining the profound impacts of a changing climate on its unique marine ecosystems. This region serves as a vital indicator for global shifts, revealing significant challenges and adaptations for its diverse oceanic life.

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The Northern North Atlantic

The northern North Atlantic is one of the regions most sensitive to past and present global changes. This book integrates the results of an interdisciplinary project studying the properties of the Greenland-Iceland-Norwegian Seas and the processes of pelagic and benthic particle formation, particle transport, and deposition in the deep-sea sediments. Ice-related and biogeochemical processes have been investigated to decipher the spatial and temporal variability of the production and fate of organic carbon in this region. Isotopic stratigraphy, microfossil assemblages and paleotemperatures are combined to reconstruct paleoceanographic conditions and to model past climatic changes in the Late Quaternary. The Greenland-Iceland-Norwegian Seas can now be considered one of the best studied subbasins of the world's oceans.

The Northern North Atlantic

This is the first book to provide assessments of multidecadal changes in resources and environments of the Large Marine Ecosystems (LMEs) of the North Atlantic. Using the case study method, researchers examine the forces driving the changes and actions underway aimed at turning the corner from declining trends in biomass yields, toward recovery of depleted species populations and improvements in ecosystem integrity. Recently a distinguished group of 24 scientists argued eloquently that a new Sustainability Science was emerging that was focused on "meeting fundamental human needs while preserving the life support systems of planet Earth". The contributions contained in this volume are at the cutting edge of Sustainability Science and the results presented by the contributors are pertinent to one of the core questions: "How are long-term trends in environment and development, including consumption and population, reshaping nature-society interactions in ways relevant to sustainability?" (Science Vol. 292, 27 April 2001). The case studies demonstrate the utility of an ecosystem-based

approach to the assessment and management of biomass yields and species sustainability. Movements toward ecosystem-based management have emerged from the case studies on the initiation of recoveries of several depleted groundfish stocks of the US Northeast Shelf LME; the collapse of the Newfoundland-Labrador Shelf cod; the assessment of physical and biological changes on the Scotian Shelf, West Greenland Shelf, Iceland Shelf LME, and the Faroe Plateau, the North Sea, and the Barents Sea LMEs. Uncertainties, with regard to environmental and human-generated forcing, are addressed in assessment of the states of the Iberian Coastal and Biscay-Celtic LMEs, and in broad-scale studies of the influences at the base of the food chain of climatic variability on the productivity and biodiversity of plankton communities of the North Atlantic. The volume concludes with an insightful perspective on the approaches used and the results reported by the eminent marine scientist and former President of ICES, Professor Gotthilf Hempel.

Large Marine Ecosystems of the North Atlantic

We are only now beginning to understand the climatic impact of the remarkable events that are now occurring in subarctic waters. Researchers, however, have yet to agree upon a predictive model that links change in our northern seas to climate. This volume brings together the body of evidence needed to develop climate models that quantify the ocean exchanges through subarctic seas, measure their variability, and gauge their impact on climate.

Arctic-Subarctic Ocean Fluxes

This research level text focuses on the influence of climate variability on the marine ecosystems of the North Atlantic. The ecological impact of climate variability on population dynamics is addressed at the full range of trophic levels, from phytoplankton through zooplankton and fish to marine birds. Climate effects on biodiversity and community structure are also examined. 40 scientists from around the world synthesise what is currently known about how climate affects the ecological systems of the North Atlantic and then place these insights within a broader ecological perspective. Many of the general features of the North Atlantic region are also seen in other marine ecosystems as well as terrestrial and freshwater systems. The final section of the book makes these generalities more explicit, so as to stimulate communication and promote co-operation amongst researchers who may previously have worked in semi-isolation. The book comprises 5 main sections: background (general introduction, atmospheric and ocean climate of the North Atlantic, and modelling methodology), plankton populations (phytoplankton and zooplankton), fish and seabird populations, community ecology (phytoplankton, benthos and fish), and the final section consisting of six commentaries from scientists working in areas outside the North Atlantic marine sector. In order to enhance integration, a series of introductions link chapters and sections. Throughout the book, numerous examples highlight different aspects of ecology-climate interactions. They document recent progress and illustrate the challenges of trying to understand ecological processes and patterns in the light of climate variations.

Marine Ecosystems and Climate Variation

Published by the American Geophysical Union as part of the Geophysical Monograph Series, Volume 173. The ocean's meridional overturning circulation (MOC) is a key factor in climate change. The Atlantic MOC, in particular, is believed to play an active role in the regional and global climate variability. It is associated with the recent debate on rapid climate change, the Atlantic Multi-Decadal Oscillation (AMO), global warming, and Atlantic hurricanes. This is the first book to deal with all aspects of the ocean's large-scale meridional overturning circulation, and is a coherent presentation, from a mechanistic point of view, of our current understanding of paleo, present-day, and future variability and change. It presents the current state of the science by bringing together the world's leading experts in physical, chemical, and biological oceanography, marine geology, geochemistry, paleoceanography, and climate modeling. A mix of overview and research papers makes this volume suitable not only for experts in the field, but also for students and anyone interested in climate change and the oceans.

Ocean Circulation

Earth's climate is changing. This book investigates the scientific, environmental, social, political, and economic aspects of climate change. It enables students to reach an informed opinion and encourages active engagement in finding solutions. It begins with a strong introduction to the scientific factors that drive natural and anthropogenic climate change and expands over three chapters to explore the impact of greenhouse gases on the distribution of solar energy across land, sea, ice, and air. The author

examines geologically ancient climates in order to highlight possible future scenarios, and case studies from around the world highlight the impact of climate change on the physical and human environment. The final chapters investigate how society can respond to the challenges of climate change and overcome the political, social, and economic factors that are barriers to progress, focusing on the role of energy policy, fiscal policy, and risk assessment as a means to stimulate discussion about science, society, and the role of the media. Science is the foundation of any solution, but to turn this knowledge into action requires the application of a broad set of skills that are rooted in the liberal arts experience such as critical thinking, analytical thinking, problem solving, and communication. This textbook will be an essential resource for students taking courses in environmental geography, climate change, natural hazards, climatology, and meteorology.

Global Climate Change

Advances in Ecology Environment and Conservation Research and Application: 2013 Edition is a ScholarlyBrief™ that delivers timely, authoritative, comprehensive, and specialized information about ZZZAdditional Research in a concise format. The editors have built Advances in Ecology Environment and Conservation Research and Application: 2013 Edition on the vast information databases of ScholarlyNews.™ You can expect the information about ZZZAdditional Research in this book to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of Advances in Ecology Environment and Conservation Research and Application: 2013 Edition has been produced by the world's leading scientists, engineers, analysts, research institutions, and companies. All of the content is from peer-reviewed sources, and all of it is written, assembled, and edited by the editors at ScholarlyEditions™ and available exclusively from us. You now have a source you can cite with authority, confidence, and credibility. More information is available at <http://www.ScholarlyEditions.com/>.

Advances in Ecology Environment and Conservation Research and Application: 2013 Edition

This book offers an up-to-date review of our current understanding of climate change in the North Sea and adjacent areas, as well as its impact on ecosystems and socio-economic sectors. It provides a detailed assessment of climate change based on published scientific work compiled by independent international experts from climate-related disciplines such as oceanography, atmospheric sciences, marine and terrestrial ecology, using a regional evaluation and review process similar to that of the Intergovernmental Panel on Climate Change (IPCC). It provides a comprehensive overview of all aspects of our changing climate, discussing a wide range of topics including past, current and future climate change, and climate-related changes in marine, terrestrial and freshwater ecosystems. It also explores the impact of climate change on socio-economic sectors such as fisheries, agriculture, coastal zone management, coastal protection, urban climate, recreation/tourism, offshore activities/energy, and air pollution.

North Sea Region Climate Change Assessment

Issues in Global Environment—Climate and Climate Change: 2013 Edition is a ScholarlyEditions™ book that delivers timely, authoritative, and comprehensive information about Climate Research. The editors have built Issues in Global Environment—Climate and Climate Change: 2013 Edition on the vast information databases of ScholarlyNews.™ You can expect the information about Climate Research in this book to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of Issues in Global Environment—Climate and Climate Change: 2013 Edition has been produced by the world's leading scientists, engineers, analysts, research institutions, and companies. All of the content is from peer-reviewed sources, and all of it is written, assembled, and edited by the editors at ScholarlyEditions™ and available exclusively from us. You now have a source you can cite with authority, confidence, and credibility. More information is available at <http://www.ScholarlyEditions.com/>.

Issues in Global Environment—Climate and Climate Change: 2013 Edition

Understanding Present and Past Arctic Environments: An Integrated Approach from Climate Change Perspectives provides a fully comprehensive overview of the past, present and future outlook for this incredibly diverse and important region. Through a series of contributed chapters, the book explores changes to this environment that are attributed to the effects of climate change. The book explores the current effects climate change has had on Arctic environments and ecosystems, our current

understanding of the effects climate change is having, the effects climate change is having on the atmospheric and ocean processes in this region. The Arctic region is predicted to experience the earliest and most pronounced global warming response to human-induced climatic change, thus a better understanding is vital. Presents a thorough understanding of the Arctic, it's past, present and future Provides an integrated assessment of the Arctic climate system, recognizing that a true understanding of its functions lies in appreciating the interactions and linkages among its various components Brings together many of the world's leading Arctic researchers to describe this diverse environment and its ecology

Understanding Present and Past Arctic Environments

This second edition brings this definitive book up to date with the many advances in our understanding of Arctic climate since the first edition was published in 2005. The book has also been extensively reorganized to weave issues of Arctic change throughout the text, rather than confining them to a single chapter. It is the first to provide an integrated assessment of the Arctic climate system, recognizing that a true understanding of how the Arctic functions lies in appreciating the interactions among its various components. The book begins with a historical perspective, followed by discussion of the basic physical and climatic characteristics of the Arctic. Following a review of past climates (paleoclimates), the book closes with an assessment of the Arctic's uncertain future. Though targeted mainly at advanced students and researchers, this book is accessible to anyone with an interest in the Arctic and a basic understanding of climate science.

The Arctic Climate System

Middle East and Mediterranean region locates at a crossroad of global climatic patterns. The region is under the influence of a convergence of different maritime conditions which together with extensive adjacent land masses marked by extreme differences in topographical features transporting continental air masses lead to a diverse climate. This edited volume is based on the best papers accepted for presentation during the 1st Springer Conference of the Arabian Journal of Geosciences (CAJG-1), Tunisia 2018. It gives new insights on patterns and mechanisms of past, present and future climate/environmental changes mainly on Middle East and Mediterranean region by international researchers. The book is of interest to all researchers in the fields of climate, paleo-climate and paleo-environmental studies. Main topics include: • Spatio-temporal Patterns of Climate Change • Sea Level Variability • Climate Change Impacts and Migration Schemes • Paleoclimate Evolution • Paleoenvironmental Evolution

ICES Status Report on Climate Change in the North Atlantic

Presented at The Arctic and Environmental Change meeting held by the Royal Society in October 1994, the fourteen papers which form the basis of this book contain a wide-ranging review of Arctic environmental change in response to global warming, and also give a broad insight into the transformation of the Arctic which we can expect during the next century. It will be an invaluable reference for anyone seeking a greater understanding of the factors and processes affecting the Arctic environment which may ultimately have a major impact on global climatic change.

Patterns and Mechanisms of Climate, Paleoclimate and Paleoenvironmental Changes from Low-Latitude Regions

This survey of ancient levels of lakes, rivers and sea, and changes in stalagmites and sediments shows an astonishing correlation between climate change and rise and fall of civilizations in the Middle East. Warm periods were characterized by aridization, economic crisis and mass migration. Cold periods brought abundant rain, prosperity and settlement. The authors conclude that climate change was the decisive factor in the origins of the "cradle of civilization".

Climate Change

Climate change is not a matter of gradually increasing temperatures. New scientific findings about how our planet works show that it does not do gradual change. Under pressure, it lurches into another mode of operation. Man-made global warming is on the verge of unleashing unstoppable planetary forces. Biological and geological monsters are being woken, and they will consume us. Virtually overnight Nature's revenge will be sudden and brutal, like a climatic tsunami sweeping across the globe. No

question, we are the last generation to live with any kind of climatic stability. In this impassioned report, Fred Pearce travels the world on the story to end them all. Most troubling, while visiting the places where the action may start: deep in the Amazon, high in the Arctic and among the bogs of Siberia, he uncovers the first signs that nature's revenge is already under way.

Arctic and Environmental Change

The global environment is changing rapidly under the impact of human activities, and an important element of this change is related to global climate modification. Can the study of climate and history help in devising strategies for coping with this change? What might be the type of information most useful in this context? What are the pitfalls awaiting the unwary? These are the kinds of questions that led us to bring together experts from the natural and social sciences with a strong interest in history, to promote discussion between workers in different disciplines by focussing on a common topic of great interest to society. The meeting was arranged in the framework of a "Hanse Conference" within the interdisciplinary program of the Hanse-Wissenschaftskolleg, a foundation set up to promote interdisciplinary studies in collaboration between the universities of Bremen and Oldenburg. The aim of the Hanse Conferences in general is to provide opportunities for experts from different fields of the sciences and humanities to come together and explore the larger framework of topics of common interest. What unites the participants is their desire to look over the fence to neighboring disciplines. Young colleagues who wish to build an interdisciplinary career are particularly welcome. In the Hanse Conference on Climate and History, we have endeavoured to build bridges between the climate sciences and the sociological sciences concerned with environmental impacts on human activities. The geological sciences, we felt, are especially well suited to the purpose because they already comprise historical aspects.

Climate Change - Environment and Civilization in the Middle East

Starting with an account of the history and distribution of the conifers, this volume describes the most important areas in Asia, Europe, North and South America with conifer forests. The last in the "Ecosystem of the World" series, it deals with the functional aspects of the conifer forests, such as physiology, production, biomass, and more.

The Last Generation

Did you know that the Grand Bank earthquake of 1929 triggered a huge submarine mass movement which broke submarine cables over a distance of up to 1000 km from its source and generated a tsunami which devastated a small village in Newfoundland killing 27 people? The same happened in Papua New Guinea in 1998 with more than 2000 casualties. Submarine mass movements of various sizes and styles are shaping the sea floor and are of concern for many facets of human activities both onshore and offshore. These include the development of natural resources, energy and communication transport, coastal infrastructures and communities. This book provides a world-wide perspective of submarine mass movements and their consequences. This has been made possible by assembling excellent contributions from active researchers, groups, or institutions, thus providing full coverage of the many scientific and engineering aspects of this type of marine and coastal geo-hazard. It covers fundamental as well as site specific studies from many areas including the Atlantic and Pacific oceans, inner seas like the Mediterranean Sea, and fjords using the most recent technologies from multibeam sonar imaging techniques, 3D seismic analysis, slope stability analysis, to debris flow and tsunami modeling. Audience: This book is of interest to any researcher in the field of marine and coastal geo-hazards. It will be useful for planners, scientists and engineers involved in the development of offshore and near-shore resources and also to those in charge of the management and mitigation of coastal hazards. For graduate students, this book provides an up-to-date vision of the process of submarine mass movements and their consequences from both a scientific and an engineering standpoint, and it includes a unique collection of the existing literature on marine geo-hazards. CD-Rom included This volume contains a CD-Rom which in addition to an electronically searchable version of the contributions, has full colour versions of figures which are printed in black and white in the book.

Climate Development and History of the North Atlantic Realm

Global changes, including climate change and intensive fishing, are having significant impacts on the world's oceans. This book advances knowledge of the structure and functioning of marine ecosystems and their major sub-systems, and how they respond to physical forcing.

Coniferous Forests

The polar regions have experienced some remarkable environmental changes in recent decades, such as the Antarctic ozone hole, the loss of large amounts of sea ice from the Arctic Ocean and major warming on the Antarctic Peninsula. The polar regions are also predicted to warm more than any other region on Earth over the next century if greenhouse gas concentrations continue to rise. Yet trying to separate natural climate variability from anthropogenic factors still presents many problems. This book presents a thorough review of how the polar climates have changed over the last million years and sets recent changes within a long term perspective. The approach taken is highly cross-disciplinary and the close links between the atmosphere, ocean and ice at high latitudes are stressed. The volume will be invaluable for researchers and advanced students in polar science, climatology, global change, meteorology, oceanography and glaciology.

Submarine Mass Movements and Their Consequences

What role does the ocean play in global climate change? Although not fully understood, there is general agreement that it is significant. Therefore, the scientific community has initiated large-scale research programs based on studies of the ocean and its relation to global climate and climate-related processes. This volume provides brief summaries and reports on the progress of the major oceanographic research programs. It looks at both programs that study processes that occur over periods ranging from days to hundreds of years—the contemporary system—and those that seek to understand long-term variations ranging from thousands to millions of years—the geological perspective.

Marine Ecosystems and Global Change

Ice Sheets and Late Quaternary Environmental Change provides a detailed account of the temporal and spatial distribution of ice sheets during the last ice age, and how these ice masses interacted with the environment. This is the first book in 20 years to detail the sizes of ice sheets during the last glaciation and the first to discuss their role in past climate change. Arranged in two parts, the first part provides the tools required for evaluating past ice sheets while the second part uses these tools to establish the size, extent and dynamics of late Quaternary ice sheets. Assuming no prior knowledge of Quaternary Science, the discussion progresses from the basic principles of how and why ice ages occur, to the interpretation of proxy records of past climate and ocean change. Instructive accounts of how the geological record can be used as evidence of former ice sheet behaviour and a discussion on the role of numerical models in understanding interaction between ice sheets, oceans and the atmosphere are included in this book. Details of former ice sheets are presented by geographical region along with a number of critical new theories on their size and behaviour. This book would appeal to 2nd/3rd year students of Quaternary Science, most University Geography, Earth Science or Geology departments, as well as researchers and academics in Quaternary Science.

Climate Change in the Polar Regions

This survey of the ancient levels of lakes, rivers and the sea, as well as changes in the compositions of stalagmites and sediments reveals an astonishing correlation of climate changes with the emergence and collapse of civilizations in the Middle East. The authors conclude that climate change has been the decisive factor in the history surrounding the origins of the "cradle of civilization".

The Ocean's Role in Global Change

The IPCC Fifth Assessment Report (AR5) highlighted that conditions within Earth's ocean are changing more rapidly than any of the time during the past 65 million years, and as a consequence, major changes are occurring in natural and human systems. While this major report has enhanced our understanding of the complexity of ocean issues, we propose this research topic as an opportunity to expand discussion on past, present and future changes across oceans regions.

Ice Sheets and Late Quaternary Environmental Change

The Arctic is now experiencing some of the most rapid and severe climate change on earth. Over the next 100 years, climate change is expected to accelerate, contributing to major physical, ecological, social, and economic changes, many of which have already begun. Changes in arctic climate will also affect the rest of the world through increased global warming and rising sea levels. The volume addresses the following major topics: - Research results in observing aspects of the Arctic climate system and its processes across a range of time and space scales - Representation of cryospheric, atmospheric, and oceanic processes in models, including simulation of their interaction with coupled models - Our understanding of the role of the Arctic in the global climate system, its response to large-scale climate variations, and the processes involved.

Climate Change -

This volume reflects the current state of scientific knowledge about natural climate variability on decade-to-century time scales. It covers a wide range of relevant subjects, including the characteristics of the atmosphere and ocean environments as well as the methods used to describe and analyze them, such as proxy data and numerical models. They clearly demonstrate the range, persistence, and magnitude of climate variability as represented by many different indicators. Not only do natural climate variations have important socioeconomic effects, but they must be better understood before possible anthropogenic effects (from greenhouse gas emissions, for instance) can be evaluated. A topical essay introduces each of the disciplines represented, providing the nonscientist with a perspective on the field and linking the papers to the larger issues in climate research. In its conclusions section, the book evaluates progress in the different areas and makes recommendations for the direction and conduct of future climate research. This book, while consisting of technical papers, is also accessible to the interested layperson.

Rapid Changes in the Arctic

The first global study by a historian to fully integrate the earth-system approach of the new climate science with the material history of humanity.

An Ocean Climate Research Plan

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

Effects of Climate Change Across Ocean Regions

This book results from a summer school held at Cornell University in 1992. The participants were graduate students and postdoctoral researchers selected from a broad range of interests and backgrounds in ecological studies. The summer school was the second in a continuing series whose underlying aim and the aim of this volume-is to bring together the different methods and concepts underpinning terrestrial, freshwater, and marine ecology. The first volume in the series focused on patch dynamics in these three ecological sectors. Here we have endeavored to complement that volume by extending its comparative approach to the consideration of ecological time series. The types of data and the methods of collection are necessarily very different in these contrasting environments, yet the underlying concept and the technical problems of analysis have much in common. It proved to be of great interest and value to the summer school participants to see the differences and then work through to an appreciation of the generalizable concepts. We believe that such an approach must have value as well for a much larger audience, and we have structured this volume to provide a comparable reading experience.

Arctic Climate Change

The symposium concluded that there is a high likelihood of a major climatic change in the Great Lakes Basin, and recommended that the U.S. and Canada establish a joint planning group to develop an integrated study of the Great Lakes Basin as a regional pilot project.

Natural Climate Variability on Decade-to-Century Time Scales

Being the only place in the northern North Atlantic yielding late Cainozoic terrestrial sediments rich in plant fossils, Iceland provides a unique archive for vegetation and climate development in

this region. This book includes the complete plant fossil record from Iceland spanning the past 15 million years. Eleven sedimentary rock formations containing over 320 plant taxa are described. For each flora, palaeoecology and floristic affinities within the Northern Hemisphere are established. The exceptional fossil record allows a deeper understanding of the role of the “North Atlantic Land Bridge” for intercontinental plant migration and of the Gulf Stream-North Atlantic Current system for regional climatic evolution. ‘Iceland sits as a “fossil trap” on one of the most interesting biogeographic exchange routes on the planet - the North Atlantic. The fossil floras of Iceland document both local vegetational response to global climate change, and more importantly, help to document the nature of biotic migration across the North Atlantic in the last 15 million years. In this state-of-the-art volume, the authors place sequential floras in their paleogeographic, paleoclimatic and geologic context, and extract a detailed history of biotic response to the dynamics of physical change.’ Bruce H. Tiffney, University of California, Santa Barbara ‘This beautifully-illustrated monograph of the macro- and microfloras from the late Cenozoic of Iceland is a worthy successor to Oswald Heer’s “Flora fossilis arctica”. Its broad scope makes it a must for all scientists interested in climatic change and palaeobiogeography in the North Atlantic region. It will remain a classic for years to come.’ David K. Ferguson, University of Vienna

Climate Change and the Course of Global History

Europe is a continent with a high coast-to-surface ratio, and European seas encompass a broad range of settings and regimes. The sustainable development of living and non-living marine resources, the protection of the marine environment and the provision of marine-based services are critical to economic prosperity and to the quality of life of European citizens. Addressing these concerns, marine-science researchers conducted a workshop reviewing major topics of European marine research. This publication contains overview and thematic background papers, as well as reports and recommendations for future research covering topics such as ocean-climate coupling, biogeochemistry, coastal and shelf processes, and ecosystem functioning/biodiversity.

Polar Environments and Global Change

Ecological Time Series