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Climate and Sea Level Change

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Sea Level Rise and Coastal Infrastructure

Sea-Level Change in the Gulf of Mexico

Responding to the Threat of Sea Level Rise

America's Climate Choices

This timely volume presents a collection of papers which address the important subject of climate and sea-level change. The contributions, from an international team of experts, present the latest important ideas and findings. The book starts with a discussion of past sea-level changes and the collection of sea-level data. The next few chapters consider projected changes in sea-level and the impacts of climatic change. The concluding chapters present case studies of the possible impacts of climatic change and sea-level rise in particular locations where the consequences could be severe, such as Bangladesh, the Netherlands, the eastern coast of China and Hong Kong.

Climate Change: Effects: Sea Level Changes Gr. 5-8

Tide gauges show that global sea level has risen about 7 inches during the 20th century, and recent satellite data show that the rate of sea-level rise is accelerating. As Earth warms, sea levels are rising mainly because ocean water expands as it warms; and water from melting glaciers and ice sheets is flowing into the ocean. Sea-level rise
poses enormous risks to the valuable infrastructure, development, and wetlands that line much of the 1,600 mile shoreline of California, Oregon, and Washington. As those states seek to incorporate projections of sea-level rise into coastal planning, they asked the National Research Council to make independent projections of sea-level rise along their coasts for the years 2030, 2050, and 2100, taking into account regional factors that affect sea level. Sea-Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future explains that sea level along the U.S. west coast is affected by a number of factors. These include: climate patterns such as the El Niño, effects from the melting of modern and ancient ice sheets, and geologic processes, such as plate tectonics. Regional projections for California, Oregon, and Washington show a sharp distinction at Cape Mendocino in northern California. South of that point, sea-level rise is expected to be very close to global projections. However, projections are lower north of Cape Mendocino because the land is being pushed upward as the ocean plate moves under the continental plate along the Cascadia Subduction Zone. However, an earthquake magnitude 8 or larger, which occurs in the region every few hundred to 1,000 years, would cause the land to drop and sea level to suddenly rise.

**The Water Will Come**

This sobering examination of climate-change and the disastrous effects of rising sea levels explains what must be done to avoid the worst outcomes. By the end of this century, hundreds of millions of people living at low elevations along coasts will be forced to retreat to higher and safer ground. Because of sea-level rise, major storms will inundate areas farther inland and will lay waste to critical infrastructure, such as water-treatment and energy facilities, creating vast, irreversible pollution by decimating landfills and toxic-waste sites. Retreat from a Rising Sea explains in gripping terms what rising oceans will do to coastal cities—detailing the specific threats faced by Miami, New Orleans, New York, and Amsterdam. This policy-oriented book then lays out the drastic actions we must take now to remove vulnerable populations. Aware of the overwhelming social, political, and economic challenges that would accompany effective action, the authors consider the burden to the taxpayer and the logistics of moving landmarks and infrastructure, including toxic-waste sites. They also show readers the alternative: thousands of environmental refugees, with no legitimate means to regain what they have lost. The authors conclude with effective approaches for addressing climate-change denialism and powerful arguments for reforming U.S. federal coastal management policies.

**Climate Variability and Change and Sea-level Rise in the Pacific Islands Region**
**Retreat from a Rising Sea**

This thoroughly revised and expanded edition of the much acclaimed Encyclopedia of Coastal Science edited by M. Schwarz (Springer 2005), presents an interdisciplinary approach that includes biology, ecology, engineering, geology, geomorphology, oceanography, remote sensing, technological advances, and anthropogenic impacts on coasts. Within its covers the Encyclopedia of Coastal Science, 2nd ed. brings together and coordinates many aspects of coastal and related sciences that are widely dispersed in the scientific literature. The broadly interdisciplinary subject matter of this volume features contributions by over 280 well-known international specialists in their respective fields and provides an abundance of figures in full-color with line drawings and photographs, and other illustrations such as satellite images. Not only does this volume offer a large number of new and revised entries, it also includes an illustrated glossary of coastal geomorphology, extensive bibliographic citations, and cross-references. It provides a comprehensive reference work for students, scientific and technical professionals as well as administrators, managers, and informed lay readers. Reviews from the first edition: Awarded for Excellence in Scholarly and Professional Publishing: "Honorable Mention", in the category Single Volume/Science from the Association of American Publishers (AAP) 2005. "The contents and approach are interdisciplinary and, under a single cover, one finds subjects normally scattered throughout scientific literature." "The topics cover a broad spectrum, so does the geographic range of the contributors. Besides geomorphologists, biologists, ecologists, engineers, geographers, geologists, oceanographers and technologists will find information related to their respective fields. Inclusion of appendices is very useful. The illustrated glossary of geomorphology will prove very useful for many of us." Roger H. Charlier, Journal of Coastal Research, Volume 21, Issue 4, Page 866, July 2005. "It is an excellent work that should be included in any carefully selected list of best science reference books of the year. "Summing Up: Highly recommended. " M.L. Larsgaard, Choice, Volume 43, Issue 6, Page 989, February 2006. "This volume is a comprehensive collection of articles covering all aspects of the subject: social and economic, engineering, coastal processes, habitats, erosion, geological features, research and observation." "As with similar works reviewed, I chose to read articles on familiar topics to see if they covered the expected, and some on unfamiliar topics to see if they could be readily understood. The book passed both tests, but the style is denser and more fact-filled than most of the encyclopedias I have reviewed." John Goodier, Reference Reviews, Volume 20, Issue 2, pages 35-36, 2006

**What We Know about Climate Change**

Rising sea level will be tomorrow's global economic and humanitarian
crisis—if we don't start adapting now. Around the world, rising sea level threatens coastal communities. It is unstoppable, requiring bold planning to avoid catastrophe. Though often seen as an environmental issue, it's more about our security and economy—and the impacts on our homes and communities. In his previous book, the bestselling High Tide on Main Street: Rising Sea Level and the Coming Coastal Crisis, renowned oceanographer John Englander clearly explained the science. In Moving to Higher Ground: Rising Sea Level and the Path Forward, he updates the latest scientific information and presents a visionary outlook for what we need to do—showing the world how to survive, and even thrive, for ourselves and future generations. Englander explains:

- Why sea level will rise regardless of efforts to reduce CO2 emissions
- How high the sea could rise in the coming decades and the effects on assets and infrastructure
- What you need to know to prepare and adapt for long-term sea level rise and short term flooding events
- Why rising sea level and the massive adaptation required could be the greatest economic engine of this century

**The Mediterranean region under climate change**

**The Implications of Climate and Sea-Level Change for Bangladesh**

Climate Change: Evidence and Causes is a jointly produced publication of The US National Academy of Sciences and The Royal Society. Written by a UK-US team of leading climate scientists and reviewed by climate scientists and others, the publication is intended as a brief, readable reference document for decision makers, policy makers, educators, and other individuals seeking authoritative information on the some of the questions that continue to be asked. Climate Change makes clear what is well-established and where understanding is still developing. It echoes and builds upon the long history of climate-related work from both national academies, as well as on the newest climate-change assessment from the United Nations' Intergovernmental Panel on Climate Change. It touches on current areas of active debate and ongoing research, such as the link between ocean heat content and the rate of warming.

**Sea Level Rise**

**This is the chapter slice "Sea Level Changes" from the full lesson plan "Climate Change: Effects"** Students gain an understanding of the effects of climate change on the environment and human life. Our resource explores how the evolution of human society is affected by the climate. Start by going back in time and exploring the ice ages from Earth's past. Learn about the lives of early humans, and how climate has affected where they move and live. Observe a homemade melting ice sheet to understand its effect on sea level. Then, create
a model to show rising sea level in action. Find out if climate change has any effect on the rise of extreme weather experienced in recent years. Learn about the dangers to human health, such as mosquitoes, heat stroke and pollution. See how changes in climate affect an area's economy by virtually destroying the farming industry. Finally, choose one ecosystem and find out how climate change is affecting it. Written to Bloom's Taxonomy and STEAM initiatives, additional hands-on activities, crossword, word search, comprehension quiz and answer key are also included.

**Sea Level Variability and Change**

For the past three decades, it has been possible to measure the earth's static gravity from satellites. Such measurements have been used to address many important scientific problems, including the earth's internal structure, and geologically slow processes like mantle convection. In principle, it is possible to resolve the time-varying component of the gravity field by improving the accuracy of satellite gravity measurements. These temporal variations are caused by dynamic processes that change the mass distribution in the earth, oceans, and atmosphere. Acquisition of improved time-varying gravity data would open a new class of important scientific problems to analysis, including crustal motions associated with earthquakes and changes in groundwater levels, ice dynamics, sea-level changes, and atmospheric and oceanic circulation patterns. This book evaluates the potential for using satellite technologies to measure the time-varying component of the gravity field and assess the utility of these data for addressing problems of interest to the earth sciences, natural hazards, and resource communities.

**Sea-Level Change**

Sea-level rise may be one of the consequences of global warming. To understand changes in sea level caused by the "greenhouse effect," we must understand the factors that have caused the sea level to fluctuate significantly throughout history. This new volume explores current views among scientists on the causes and mechanisms of sea-level change. The authors examine measurement programs and make recommendations aimed at improving our understanding of the factors that affect sea level. It will be welcomed by scientists, engineers, and policymakers concerned about "greenhouse" issues and sea-level change, the environmental community, researchers, and students.

**Sea Level Rise in Florida**

In Resilience: The Science of Adaptation to Climate Change leading experts analyze and question ongoing adaptation interventions. Contributions span different disciplinary perspectives, from law to engineering, and cover different regions from Africa to the Pacific.
Chapters assess the need for adaptation, highlighting climate change impacts such as sea level rise, increases in temperature, changing hydrological variability, and threats to food security. The book then discusses the state of global legislation and means of tracking progress. It reviews ways to build resilience in a range of contexts—from the Arctic, to small island states, to urban areas, across food and energy systems. Critical tools for adaptation planning are highlighted—from social capital and ethics, to decision support systems, to innovative finance and risk transfer mechanisms. Controversies related to geoengineering and migration are also discussed. This book is an indispensable resource for scientists, practitioners, and policy makers working in climate change adaptation, sustainable development, ecosystem management, and urban planning. Provides a summary of tools and methods used in adaptation including recent innovations Includes chapters from a diverse range of authors from academic institutions, humanitarian organizations, and the United Nations Evaluates adaptation options, highlighting gaps in knowledge where further research or new tools are needed

**Sea Level Rise**

A must-read for Gulf Coast scientists, naturalists, and residents. From Florida to Mexico and along the shores of Cuba, the coasts of the Gulf of Mexico are vulnerable to sea-level rise because of their fragile and low-lying shorelines and adjacent coastal environments. In addition to wetlands, river deltas, beaches, and barrier islands, millions of people who live and work along the Gulf coast are susceptible to the affects of both intense storms in the short term and a gradual rise in sea level over the longer term. While global warming headlines any current discussion of this topic and is certainly a major factor in sea-level change, it is not the only factor. Earthquakes and other crustal shifts, the El Niño/La Niña phenomena, river impoundment and sedimentation, tides, and weather can all affect local, regional, and global sea levels. In *Sea-Level Change in the Gulf of Mexico*, Richard A. Davis Jr. looks at the various causes and effects of rising and falling sea levels in the Gulf of Mexico, beginning with the Gulf’s geological birth over 100 million years ago, and focusing on the last 20,000 years, when global sea levels began rising as the glaciers of the last major ice age melted. Davis reviews the current situation, especially regarding beach erosion and loss of wetlands, and offers a preview of the future, when the Gulf Coast will change markedly as the twenty-first century progresses. Amply illustrated and written in a clear, straightforward style, *Sea-Level Change in the Gulf of Mexico* is a valuable resource for anyone who cares deeply about understanding the past, present, and future of life along the coast of the Gulf of Mexico.

**Climate Change**

Sea level rise and coastal erosion had drawn an increasing awareness...
recently as the repercussion of increase of sea level and coastal erosion would reshape the earth's system and induce a tremendous loss in ecological or economics cost. Governments are dedicated to meliorate the occurrence of these phenomena, or else all creations on the earth will suffer from the catastrophe. Global warming is one of the crucial factors resulting in the increase of sea level and coastal erosion. Remote sensing and geographic information systems (GIS) technologies are thoroughly adopted and applied to monitor the dynamic change of the nature system, such as coastal land use and land cover, sea level rise, and coastal infrastructure.

Encyclopedia of Coastal Science

Climate variability in different ocean basins can impact one another, for instance the El Niño/Southern Oscillation (ENSO) in the Pacific Ocean has remote effects on other tropical oceans around the world, which in turn modulate ENSO. With chapters by eminent researchers, this book provides a comprehensive review on how interactions among the climates in different ocean basins are key contributors to global climate variability. It discusses how interbasin interactions are mediated by oceanic and atmospheric bridges and explains exciting new possibilities for enhancing climate prediction globally. The first part of the book covers essential theory and introduces the basic mechanisms for remote connection and local amplification. The second presents outstanding examples. The latter part discusses applications to cases of societal interest such as impacts on monsoon systems and expectations after climate change. This comprehensive reference is a useful resource for graduate students and researchers in the atmospheric and ocean sciences.

Sea-Level Rise for the Coasts of California, Oregon, and Washington

An introduction to the scientific consensus on the human role in global warming.

Understanding Sea-level Rise and Variability

A textbook that explains the causes of potentially devastating changes in sea level.

Interacting Climates of Ocean Basins

Climate change is occurring. It is very likely caused by the emission of greenhouse gases from human activities, and poses significant risks for a range of human and natural systems. And these emissions continue to increase, which will result in further change and greater risks. America's Climate Choices makes the case that the environmental, economic, and humanitarian risks posed by climate change indicate a
pressing need for substantial action now to limit the magnitude of climate change and to prepare for adapting to its impacts. Although there is some uncertainty about future risk, acting now will reduce the risks posed by climate change and the pressure to make larger, more rapid, and potentially more expensive reductions later. Most actions taken to reduce vulnerability to climate change impacts are common sense investments that will offer protection against natural climate variations and extreme events. In addition, crucial investment decisions made now about equipment and infrastructure can "lock in" commitments to greenhouse gas emissions for decades to come. Finally, while it may be possible to scale back or reverse many responses to climate change, it is difficult or impossible to "undo" climate change, once manifested. Current efforts of local, state, and private-sector actors are important, but not likely to yield progress comparable to what could be achieved with the addition of strong federal policies that establish coherent national goals and incentives, and that promote strong U.S. engagement in international-level response efforts. The inherent complexities and uncertainties of climate change are best met by applying an iterative risk management framework and making efforts to significantly reduce greenhouse gas emissions; prepare for adapting to impacts; invest in scientific research, technology development, and information systems; and facilitate engagement between scientific and technical experts and the many types of stakeholders making America's climate choices.

**Responding to Rising Seas OECD Country Approaches to Tackling Coastal Risks**

Sea Level Rise, History and Consequences includes a special emphasis on the evidence for historical sea level change; case studies are used to demonstrate the resulting consequences. A CD-ROM is included which contain tide gauge data and trends of relative sea level from the Permanent Service for Mean Sea Level. The material on the CD-ROM is either in the form of text files, or web sites that can be opened by widely available web-browsers. Sea level is expected to rise as much as 60-100 centimeters over the next century due to greenhouse-induced global warming -- or at least that is what the some scientists predict. However, the concept of sea level is extremely complex, which makes the prediction of sea level rise anything but certain. The reviewers are in consensus in enthusiastically endorsing this comprehensive book and CD-ROM treatment. This book will be a comprehensive review of the subject using the data themselves (on CD-ROM) to illustrate the principles involved, rather than detailed mathematical treatments. The book should be readily accessible to upper division and first-year graduate students in the environmental sciences, geography, geology, and other interdisciplinary fields. Four pages (up to 16 pages) of color in the printed text. The book will have wide appeal. It will be read by geologists, geophysicists, climatologists, oceanographers, meteorologists, environmental scientists, geomorphologists, coastal engineers, and policy makers in
all of these fields.

**Resilience**

The climate of the Earth is always changing. As the debate over the implications of changes in the Earth's climate has grown, the term climate change has come to refer primarily to changes we've seen over recent years and those which are predicted to be coming, mainly as a result of human behavior. This book serves as a broad, accessible guide to the science behind this often political and heated debate by providing scientific detail and evidence in language that is clear to both the non-specialist and the serious student. * provides all the scientific evidence for and possible causes of climate change in one book * written by expert scientists working in the field * logical, non-emotional conclusions * a source book for the latest findings on climate change

**The Rising Sea**

**Adaptations of Coastal Cities to Global Warming, Sea Level Rise, Climate Change and Endemic Hazards**

Coastal Disasters and Climate Change in Vietnam is the first book to focus specifically on natural hazards and climate change in Vietnam. The book examines threats such as tropical cyclones, sea-level rise, flooding, erosion, and salinity intrusion, and their respective effects on coastal structures and environments. It also looks at crucial management and mitigation efforts, including breakwater design, irrigation systems, coastal dunes and dikes, and more. The challenges faced by this country in the future will have important regional and global repercussions; areas such as the Mekong Delta produce a significant proportion of the world’s rice, and coastal impacts on this region will have far-reaching economic and public health effects. This book is an important source of information for government and local policy makers, environmental and climate scientists, and engineers. Broad coverage of climate challenges specific to the region, including sea-level rise, storms, erosion, and more Assessments of impact on, and effects of, economic development and port construction Examination of public policy responses to climate change

**Climate Change**

Multidisciplinary edited volume on policy dimensions of climate change for the world's oceans, for researchers, policymakers and activists.

**Adaptation to Climate Change and Sea Level Rise**
Sponsored by the Council on Disaster Risk Management Sea Level Rise and Coastal Infrastructure: Prediction, Risks, and Solutions analyzes the challenges posed by rising sea levels and climate change. Scientists estimate that global sea levels could rise by as much as 20 feet in this century, directly affecting about 100 million people worldwide. Although the problems stemming from higher sea levels are formidable, immediate actions can be identified and executed to lessen the impact of rising waters on coastal infrastructure and communities. Using a risk analysis and management framework, each chapter in this volume focuses on a facet of sea level rise, examining its associated risks and assessing its socioeconomic impact. From this information, appropriate long-term measures and mitigation strategies can be developed. Chapters consider such questions as: How can we model the impact of rising sea levels and increasingly intense tropical storms on coastal infrastructure? What strategies can be phased in to improve new construction? How can existing infrastructure best be targeted for retrofitting? How can risk models be designed to accommodate regional socioeconomic considerations? Engineers, scientists, and policymakers concerned with planning, design, and construction of coastal infrastructure will find this compact assessment useful, relevant, and thought-provoking.

**Changing Sea Levels**

Acknowledging the impending worldwide catastrophe of rising seas in the twenty-first century, Orrin H. Pilkey and Keith C. Pilkey outline the impacts on the United States' shoreline and argue that the only feasible response along much of the U.S. shoreline is an immediate and managed retreat.

**Moving to Higher Ground**

Although the "greenhouse effect" and "global climate change" have been the subjects of scientific scrutiny for many decades, only recently have they received widespread public attention. Two major events helped generate this attention. First, in 1990 the Intergovernmental Panel on Climate Change (IPCC) published its findings on the science, impacts and policy implications of climate change. The findings of the IPCC, prepared and reviewed extensively by the world's leading experts in the field, confirmed that the increasing atmospheric concentrations of "greenhouse" gases, such as carbon dioxide, methane, nitrous oxide and the chlorofluorocarbons, could cause the world to warm and sea level to rise. Second, in 1992 the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro focussed the attention of the world's national governments, as well as organisations and individuals outside the governments, on the threat of global climate change. The Framework Convention on Climate Change (FCCC), signed by nations at UNCED, reflects both the concern about the effects of climate change and the urgent need for action to
prevent or reduce its potential impacts, particularly with respect to the vulnerable developing countries of the world. Bangladesh ratified the FCCC on 15 April 1994. The countries that have signed and ratified the FCCC are obligated to report to the Conference of the Parties (CoP) to the Convention on a number of inter related issues.

**Sea-level Change**

There is an urgent need to ensure that coastal areas are adapting to the impacts of climate change. Risks in these areas are projected to increase because of rising sea levels and development pressures. This report reviews how OECD countries can use their national adaptation planning processes.

**Climate Change and Sea Level Rise in South Florida**

In June 2015 we held a workshop on the beautiful island of Mallorca, Spain with a focus on sea level variability and change. Over 120 sea level experts from around the world attended this workshop, from a range of different disciplines. The main aims of the workshop were to: 1.) Evaluate the current state-of-knowledge of sea level science; 2.) Identify gaps and unresolved questions in any aspect of sea level science; and 3.) Design future research to address these issue. All aspects of sea level changes were covered, from global to regional, observations and modelling, processes driving mean sea level changes and extremes, from the geological scale to the instrumental era and future projections and including impacts on the coastal zones. This E-Book presents papers that came out of that workshop. Overall, these papers illustrate the multi-disciplinary nature of sea level research, cross-cutting many fields of research including: oceanography, meteorology, geology, coastal morphodynamics, engineering and the social-economic aspects. Collectively, theses articles represent an interesting range of perspectives and original studies that contribute to understanding the dynamic nature of sea level and its impacts across a wide range of time and space scales. Enjoy reading them!

**Scientific Ocean Drilling**

"A scientifically credible and highly readable account of what is likely the greatest threat to Florida's environment, economy, and culture over the coming decades."--Reed F. Noss, author of Forgotten Grasslands of the South "Every Floridian should read this book. It is the clearest and most readable description of how and why the sea level changes and what the future has in store for us."--Orrin H. Pilkey, coauthor of Global Climate Change: A Primer Sea levels are rising--globally and in Florida. Climatologists, geologists, oceanographers, and the overwhelming majority of the scientific community expect a continuation of this trend for centuries to come. While Florida's natural history indicates that there is nothing new
about the changing elevation of the sea, what is new--and alarming--is the combination of the rising seas and the ever-growing, immobile human infrastructure near the coasts: high-rise condos, suburban developments, tourist meccas, and international metropolises. The stakes are particularly high in Florida, where much of the landscape is already topographically low and underlain by permeable limestone. Modern-day sea-level rise poses unprecedented challenges for sustainability, urban planning, and political action. Sea Level Rise in Florida offers an in-depth examination of the rise and fall of sea levels in the past and the science behind the current data, both measured and projected. The authors also discuss ongoing and potential consequences for natural marine and coastal systems and how we can begin to plan strategically for the inevitable changes.

**Coastal Disasters and Climate Change in Vietnam**

A surprising number of maritime boundaries remain unresolved, and a range of reasons can be cited to explain why the process of delimiting these boundaries has been so slow. This volume addresses and analyzes some of these reasons, focusing on some of the volatile disputes in Northeast Asia and in North America. Scholars from Asia, the United States, and Europe grapple with festering controversies and apply insights gained from resolved disputes to those that remain unresolved. Islands continue to haunt this process, and the way in which they should affect maritime boundaries remains in dispute. The United States has a number of disputed boundaries with its neighbors to the north and south, and these are examined. Antarctica is a concern of all nations, and the regimes governing the Southern Ocean surrounding Antarctica are analyzed. The International Tribunal for the Law of the Sea was created to allow countries to resolve their disputes peacefully, and two chapters look at how this new court is operating. The impact of sea-level rise on maritime boundaries is given special attention in the opening chapter. This volume presents a wonderful collection of provocative chapters written by the top scholars in the field of International Ocean Law. It should help scholars, students, and decision makers to understand the current state of this field and to move some of the difficult disputes toward resolution.

**External Controls on Deep-water Depositional Systems**

Through direct exploration of the subseafloor, U.S.-supported scientific ocean drilling programs have significantly contributed to a broad range of scientific accomplishments in Earth science disciplines, shaping understanding of Earth systems and enabling new fields of inquiry. Scientific Ocean Drilling: Accomplishments and Challenges reviews the scientific accomplishments of U.S.-supported scientific ocean drilling over the past four decades. The book evaluates how the programs (Deep Sea Drilling Project [DSDP], 1968-1983, Ocean Drilling Program [ODP], 1984-2003, and Integrated
Ocean Drilling Program (IODP, 2003-2013) have shaped understanding of Earth systems and Earth history and assessed the role of scientific ocean drilling in enabling new fields of inquiry. This book also assesses the potential for transformative discoveries for the next proposed phase of scientific ocean drilling, which is scheduled to run from 2013 to 2023. The programs' technological innovations have played a strong role in these accomplishments. The science plan for the proposed 2013-2023 program presents a strong case for the continuation of scientific ocean drilling. Each of the plan's four themes identifies compelling challenges with potential for transformative science that could only be addressed through scientific ocean drilling, although some challenges appear to have greater potential than others. Prioritizing science plan challenges and integrating multiple objectives into single expeditions would help use resources more effectively, while encouraging technological innovations would continue to increase the potential for groundbreaking science.

**The West Antarctic Ice Sheet**

An eye-opening and essential tour of the vanishing world What if Atlantis wasn’t a myth, but an early precursor to a new age of great flooding? Across the globe, scientists and civilians alike are noticing rapidly rising sea levels, and higher and higher tides pushing more water directly into the places we live, from our most vibrant, historic cities to our last remaining traditional coastal villages. With each crack in the great ice sheets of the Arctic and Antarctica, and each tick upwards of Earth's thermometer, we are moving closer to the brink of broad disaster. By century’s end, hundreds of millions of people will be retreating from the world's shores as our coasts become inundated and our landscapes transformed. From island nations to the world's major cities, coastal regions will disappear. Engineering projects to hold back the water are bold and may buy some time. Yet despite international efforts and tireless research, there is no permanent solution – no barriers to erect or walls to build – that will protect us in the end from the drowning of the world as we know it. The Water Will Come is the definitive account of the coming water, why and how this will happen, and what it will all mean. As he travels across twelve countries and reports from the front lines, acclaimed journalist Jeff Goodell employs fact, science, and first-person, on-the-ground journalism to show vivid scenes from what already is becoming a water world. ‘This harrowing, compulsively readable, and carefully researched book lays out in clear-eyed detail what Earth's changing climate means for us today, and what it will mean for future generations It’s a thriller in which the hero in peril is us.’ ?John Green, bestselling author of The Fault in Our Stars

‘Jeff Goodell grabs you on the first page and doesn't hold up until this essential story is told. He presents a vivid warning and a call to arms to the generation that gets to decide how fast, and how high, the water will come.’ ?Scott Ludlam, former Australian Greens Senator

‘A well-rounded, persuasive survey. A frightening, scientifically...’
grounded, and starkly relevant look at how climate change will affect coastal cities.’ ?Kirkus, Starred Review ‘In this engaging book, environmental writer Goodell points out that while sea levels have always risen and fallen, the current rise is driven primarily by the dramatically accelerating melting of the arctic ice caps, and with so many cities on seashores, this will be devastating.’ ?Booklist, Starred Review

**Maritime Boundary Disputes, Settlement Processes, and the Law of the Sea**

This book discusses the identification of, solutions to, and management of threats to high population coastal cities and their seaports from global warming, climate change and endemic hazards. These include prevention of sea water intrusion of freshwater coastal aquifers, emplacement of barriers that mitigate the threats from sea level rise, and inundation of urban centers plus those from storm surges that cause flooding and salination of inshore terrain. The book assesses mitigation of the effects of extreme weather events such as drought, and major flooding from heavy rainfall on coastal urban centers, or on associated drainage basins. It also considers how coastal cities can counter vulnerabilities from other physical hazards (e.g., earthquakes – building codes) and health hazards (e.g., pollution, public health response – preparedness) that may be related to a city’s geological/geographical location and service as a port of entry for goods and travelers (regional and international). The book also cites the high costs of safeguarding citizen and municipal assets, but notes possible sources of potential funding especially from less developed and developing nations. The book is written to give strong background information to students majoring in environmental sciences or those in other majors with interests in the effects of global warming/climate change, and will be of interest to social scientists, think tank personnel, government planners, and lay persons in environmentally oriented organizations.

**Climate and Sea Level Change**

Understanding Sea-Level Rise and Variability identifies the major impacts of sea-level rise, presents up-to-date assessments of past sea-level change, thoroughly explores all of the factors contributing to sea-level rise, and explores how sea-level extreme events might change. It identifies what is known in each area and what research and observations are required to reduce the uncertainties in our understanding of sea-level rise so that more reliable future projections can be made. A synthesis of findings provides a concise summary of past, present and future sea-level rise and its impacts on society. Key Features: Book includes contributions from a range of international sea level experts Multidisciplinary Four color throughout Describes the limits of our understanding of this crucial
issue as well as pointing to directions for future research. The book is for everyone interested in sea-level rise and its impacts, including policy makers, research funders, scientists, students, coastal managers and engineers. Additional resources for this book can be found at: http://www.wiley.com/go/church/sealevel.

**Satellite Gravity and the Geosphere**

This book has been published by Allenvi (French National Alliance for Environmental Research) to coincide with the 22nd Conference of Parties to the United Nations Framework Convention on Climate Change (COP22) in Marrakesh. It is the outcome of work by academic researchers on both sides of the Mediterranean and provides a remarkable scientific review of the mechanisms of climate change and its impacts on the environment, the economy, health and Mediterranean societies. It will also be valuable in developing responses that draw on “scientific evidence” to address the issues of adaptation, resource conservation, solutions and risk prevention. Reflecting the full complexity of the Mediterranean environment, the book is a major scientific contribution to the climate issue, where various scientific considerations converge to break down the boundaries between disciplines.

**Sea Level Rise and Coastal Infrastructure**

The future rate and extent of sea level rise are highly uncertain, and responses to higher water levels will need to reflect this uncertainty. Sea level rise was a major topic of the annual meeting of the National Academy of Engineering on October 9â€“10, 2016, and the second day featured a forum on adaptation to it. This summary of the forum, which also incorporates material from Robert J. Nicholls' plenary presentation, outlines a rich and challenging set of problems for engineers, scientists, and those who work with them.

**Climate Change and Ocean Governance**

**Sea Level Rise and Coastal Infrastructure**

The book provides a concise and interdisciplinary outlook on the impacts of climate change on coastal areas and how coastal communities adapt to them. The first chapter analyses how sea level rise, changing ocean conditions, or increased climate variability and the socio-environmental context of the coastal zone leads to vulnerable communities. The second chapter addresses adaptation strategies and tools, and gives some examples of their application around the world. The third chapter describes participative action research projects undertaken in New Brunswick and how this community based approach has enabled communities to increase their climate resilience.
**Sea-Level Change in the Gulf of Mexico**

South Florida is frequently cited as the part of the United State of America as most susceptible to the devastation accompanying sea level rise. Several scholarly studies have shown the negative impact of coastal location in Florida on housing values. Are the residents of South Florida concerned? Is susceptibility to sea level rise actually affecting the housing market in terms of demand, the availability of home mortgages, or house prices? Are people living at particular risk from sea level rise aware of this risk and more open to new information about climate change? Do they support policies and laws to mitigate the pace and extent of climate change? Answers to these questions are not only of general interest, but they are also key to our understanding of the human dimensions of this problem. This book describes the results of a detailed survey in which respondents viewed a local map displaying flooding to their own community that would result from a Category 3 hurricane in 2033. It discusses political party identification and ideology that has an overwhelming impact in shaping views about sea level rise and climate change. This book has enormous implications for the effectiveness of communicating risk information. The text is important if we, as a nation, are to design communication strategies that will lead to broader policy to combat or mitigate this risk.

**Responding to the Threat of Sea Level Rise**

On Shishmaref Island in Alaska, homes are being washed into the sea. In the South Pacific, small island nations face annihilation by encroaching waters. In coastal Louisiana, an area the size of a football field disappears every day. For these communities, sea level rise isn’t a distant, abstract fear: it’s happening now and it’s threatening their way of life. In The Rising Sea, Orrin H. Pilkey and Rob Young warn that many other coastal areas may be close behind. Prominent scientists predict that the oceans may rise by as much as seven feet in the next hundred years. That means coastal cities will be forced to construct dikes and seawalls or to move buildings, roads, pipelines, and railroads to avert inundation and destruction. The question is no longer whether climate change is causing the oceans to swell, but by how much and how quickly. Pilkey and Young deftly guide readers through the science, explaining the facts and debunking the claims of industry-sponsored “skeptics.” They also explore the consequences for fish, wildlife—and people. While rising seas are now inevitable, we are far from helpless. By making hard choices—including uprooting citizens, changing where and how we build, and developing a coordinated national response—we can save property, and ultimately lives. With unassailable research and practical insights, The Rising Sea is a critical first step in understanding the threat and keeping our heads above water.