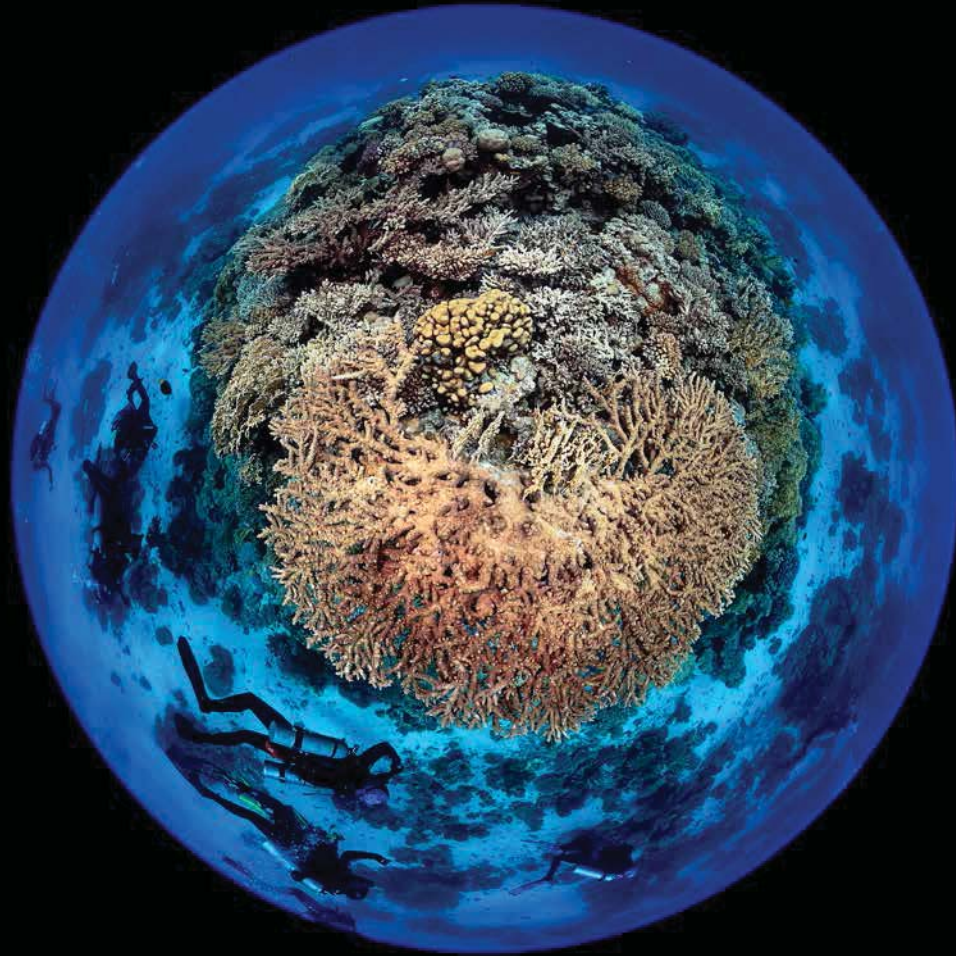


The Second World Ocean Assessment

WORLD OCEAN ASSESSMENT II

Volume I



United Nations

The Second
**World Ocean
Assessment**

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Volume I



United Nations

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Foreword

by the Secretary-General

The past year has presented unprecedented challenges. The coronavirus disease (COVID-19) pandemic has disrupted lives and livelihoods and exposed our societies' fragility. Sadly, the pandemic is not the only crisis that humanity faces. Climate change and biodiversity loss continue unabated, threatening sustainable development and our viability as a species. These challenges are particularly evident when we look at the state of our planet's life support system, the ocean.

In 2015, the first *World Ocean Assessment* warned that many areas of the ocean had been seriously degraded, the greatest threat to the ocean being the failure to deal with the many pressures caused by human activities. The message in the second *World Ocean Assessment* is that the situation has not improved, with the many benefits that the ocean provides at risk. The *Assessment* advises that, to ensure sustainability, we must work together to improve integrated ocean management, including through joint research, capacity development and the sharing of data, information and technology.

The ocean plays a crucial role in the achievement of the Sustainable Development Goals and the livelihoods of billions of people. We urgently need to change how we interact with it. The forthcoming United Nations Decade of Ocean Science for Sustainable Development and the United Nations Decade on Ecosystem Restoration provide opportunities for us to understand more and to reverse the damage that has already been done. The information in the second *Assessment* can assist in this process, as well as inform relevant intergovernmental conferences scheduled for 2021.

I urge leaders and all stakeholders to heed the warnings in the *Assessment* as we work to conserve and sustainably manage our planet's marine environment. Let us foster not only a green but also a blue recovery from the COVID-19 pandemic.

ANTÓNIO GUTERRES

Summary

In its resolutions 57/141 and 58/240, the General Assembly decided to establish a regular process under the United Nations for global reporting and assessment of the state of the marine environment, including socioeconomic aspects, both current and foreseeable, building on existing regional assessments. In its resolution 71/257, the Assembly recalled that the scope of the first cycle of the Regular Process focused on establishing a baseline and decided that the scope of the second cycle would extend to evaluating trends and identifying gaps. The programme of work for the period 2017–2020 of the second cycle of the Regular Process includes the preparation by the Group of Experts of the Regular Process for Global Reporting and Assessment of the State of the Marine Environment, including Socioeconomic Aspects, of the second *World Ocean Assessment*, building on the baselines established by the First Global Integrated Marine Assessment (first *World Ocean Assessment*). In its resolution 72/73, the Assembly decided that the Group of Experts should proceed on the basis of a single comprehensive assessment. The present document was prepared by the Group of Experts in accordance with those decisions.

Disclaimer

The present document is a product of the Group of Experts of the Regular Process for Global Reporting and Assessment of the State of the Marine Environment, including Socioeconomic Aspects, which is responsible for the contents of the publication. The members of the Group of Experts and the pool of experts who participated in the writing of the second *World Ocean Assessment* contributed in their personal capacity. The members of the Group and the pool are not representatives of any Government or any other authority or organization.

The designations employed, including geographical names, and the presentation of the materials in the present publication, including the citations, maps and bibliography, do not imply the expression of any opinion whatsoever on the part of the United Nations concerning the names and legal status of any country, territory, city or area or of its authorities or concerning the delimitation of its frontiers or boundaries and do not imply official endorsement or acceptance by the United Nations. Information contained in the present publication emanating from actions and decisions taken by States does not imply official endorsement, acceptance or recognition by the United Nations of such actions and decisions, and such information is included without prejudice to the position of any State Member of the United Nations.

Preface

The goal for the General Assembly in creating the Regular Process for the Global Reporting and Assessment of the State of the Marine Environment, including Socioeconomic Aspects, was to ensure a comprehensive overview of the ocean and the relationships between the ocean and humans, covering all environmental, social and economic aspects. Such an overview would serve as a background to the many decisions that must be taken in that field at the international, national and local levels in pursuit of sustainable development. The first *World Ocean Assessment* was completed in 2015 and represents a major step towards that goal.

Inevitably, with such an ambitious goal, not only were some aspects not fully covered in the first output of the Regular Process, but also, as time passed, the assessment that was made up to 2015 needed to be updated. The General Assembly therefore provided for further global integrated marine assessments to record developments from the baseline provided by the first Assessment and, where possible, to show trends. In 2016, it decided that a second comprehensive assessment should be prepared by the end of 2020.

The present volume contains the second *World Ocean Assessment*. It provides more information on aspects of the ocean and its relationships with humans, including separate assessments of the abyssal plains and marine hydrates, and brings together in specific chapters matters that were addressed in different sections of the first Assessment, such as the state of fish species and marine infrastructure.

As with the first Assessment, the production of the present Assessment has been a major task, relying essentially on voluntary efforts of hundreds of experts in many fields, with support from the regular budget of the United Nations. As before, it has been a privilege for the Group of Experts of the Regular Process for Global

Reporting and Assessment of the State of the Marine Environment, including Socioeconomic Aspects, to organize, contribute to and finalize the Assessment. Crucial support has again been provided by the Secretariat, including the Division for Ocean Affairs and the Law of the Sea, several international organizations and a number of States Members of the United Nations, as detailed in chapter 2. The Group of Experts is grateful to all those people and institutions but, under the terms of reference and working methods endorsed by the General Assembly, is ultimately responsible for the final text.

The bulk of the text was written before the outbreak of the coronavirus disease (COVID-19) pandemic. Some mention of the effects of that pandemic has been included (for example, in the sections of chapter 8A dealing with fisheries, shipping and tourism), but the full implications of the pandemic on human interactions with the ocean are still being worked out and will need to be explored fully in the third cycle of the Regular Process. Nevertheless, the ocean and the services that it provides will have an important role in the recovery from the pandemic. It is hoped that the information in the present Assessment will help with that process.

As with the first Assessment, the present document contains no policy analysis or recommendations, in line with the guidance endorsed by the General Assembly. It is therefore for national Governments and competent international authorities to decide what action should be taken in the light of the assessments under the Regular Process.

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Joint Coordinators of
the Group of Experts of the Regular Process

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Contents

Volume I

	<i>Page</i>
Foreword by the Secretary-General	iii
Summary	v
Preface	vii
Part one: Summary	1
Chapter 1: Overall summary	3
Keynote points	5
1. Introduction	5
2. Drivers	6
3. Cleaning up the ocean	7
4. Protecting marine ecosystems	10
5. Understanding of the ocean for sustainable management	13
6. Promoting safety from the ocean	15
7. Sustainable food from the ocean	16
8. Sustainable economic use of the ocean	19
9. Effective implementation of international law as reflected in the United Nations Convention on the Law of the Sea	21
Part two: Introduction	37
Chapter 2: Approach to the assessment	39
Keynote points	41
1. Purpose of the second <i>World Ocean Assessment</i>	41
2. Primary audience and framework of the second <i>World Ocean Assessment</i>	42
3. Preparation of the second <i>World Ocean Assessment</i>	43
4. Terminology	44
5. Acknowledgements	45
References	45
Chapter 3: Scientific understanding of the ocean	47
Keynote points	49
1. Introduction	49
2. Description of changes in data, technology and models since the first <i>World Ocean Assessment</i> and their consequences for overall understanding, including socioeconomic consequences	50

	<i>Page</i>
3. Key region-specific changes and consequences	51
4. Outlook for scientific understanding of the ocean	56
5. Key remaining knowledge gaps	56
6. Key remaining capacity-building gaps	57
References	58
Part three: Drivers of changes in the marine environment	63
Chapter 4: Drivers	65
Keynote points	67
1. Introduction	67
2. Drivers of change in the marine environment	69
3. Key region-specific issues or aspects associated with drivers	73
4. Outlook	74
5. Key remaining knowledge and capacity-building gaps	76
References	77
Part four: Current state of the marine environment and its trends	81
Chapter 5: Trends in the physical and chemical state of the ocean	83
Keynote points	85
1. Introduction	85
2. Physical and chemical state of the ocean	87
3. Knowledge gaps	100
4. Summary	101
References	103
Chapter 6: Trends in the biodiversity of the main taxa of marine biota	111
Introduction	113
Chapter 6A: Plankton (phytoplankton, zooplankton, microbes and viruses)	115
Keynote points	117
1. Introduction	117
2. Summary of chapter 6 of the first <i>World Ocean Assessment</i>	118
3. Regions targeted in the present <i>World Ocean Assessment</i>	119
4. Estimating plankton diversity	120
5. Microbial plankton	121
6. Metazoan zooplankton	124
7. Documented trends	125
8. Outlook	128
References	130

	<i>Page</i>
Chapter 6B: Marine invertebrates	141
Keynote points	143
1. Introduction.....	143
2. Summary of the situation recorded in the first <i>World Ocean Assessment</i> .	143
3. Description of environmental changes (2010–2020).....	144
4. International and governmental responses	151
5. Achievement of relevant Sustainable Development Goals and contribution to Aichi Biodiversity Target 11	153
6. Key remaining knowledge gaps and capacity-building gaps	153
References.....	154
Addendum by the Group of Experts of the Regular Process for Global Reporting and Assessment of the State of the Marine Environment, including Socioeconomic Aspects.....	158
References.....	159
Chapter 6C: Fishes	161
Keynote points	163
1. Introduction.....	163
2. Documented change in the state of fish biodiversity	165
3. Consequences of biodiversity change on human communities, economies and well-being	168
4. Key region-specific changes and consequences.....	169
5. Outlook	171
References.....	172
Chapter 6D: Marine mammals	177
Keynote points	179
1. Introduction.....	179
2. Cetaceans.....	181
3. Pinnipeds.....	184
4. Sirenians	186
5. Otters and polar bear.....	186
6. Consequences of changes on human communities, economies and well-being.....	187
7. Outlook	188
8. Key remaining knowledge gaps	189
9. Key remaining capacity-building gaps.....	189
References.....	190

	<i>Page</i>
Chapter 6E: Marine reptiles	195
Keynote points	197
1. Introduction.....	197
2. Conservation status of marine reptiles	197
3. Regional trends.....	199
4. Threats.....	201
5. Economic and social consequences of the changes to marine reptile populations	203
6. Key knowledge and capacity-building gaps	204
References.....	205
Chapter 6F: Seabirds.....	211
Keynote points	213
1. Introduction.....	213
2. Description of environmental changes between 2010 and 2020.....	214
3. Consequences of changes in seabird populations on human communities, economies and well-being	217
4. Outlook	218
5. Key remaining knowledge gaps	219
6. Key remaining capacity-building gaps.....	220
References.....	220
Chapter 6G: Marine plants and macroalgae.....	225
Keynote points	227
1. Introduction.....	227
2. Mangroves	227
3. Salt marsh plants	229
4. Seagrasses	230
5. Macroalgae.....	232
6. Consequences of changes on human communities, economies and well-being.....	240
7. Key remaining knowledge and capacity-building gaps	241
8. Outlook	241
References.....	242
Chapter 7: Trends in the state of biodiversity in marine habitats.....	251
Introduction	253
Chapter 7A: Intertidal zone.....	255
Keynote points	257
1. Introduction.....	257
2. Description of the environmental changes between 2010 and 2020.....	260

	<i>Page</i>
3. Economic and social consequences	261
4. Key region-specific changes and consequences	261
5. Outlook	262
6. Key remaining knowledge gaps	263
7. Key remaining capacity-building gaps	263
References	264
Chapter 7B: Biogenic reefs and sandy, muddy and rocky shore substrates	267
Keynote points	269
1. Introduction	269
2. Documented change in state of biogenic reefs and sandy, muddy and rocky shore substrates	272
3. Consequences of the changes on human communities, economies and well-being	275
4. Key region-specific changes and consequences	277
5. Outlook	279
6. Key remaining knowledge and capacity-building gaps	280
References	281
Chapter 7C: Atoll and island lagoons	289
Keynote points	291
1. Introduction	291
2. Documented changes in state of atolls and island lagoons	292
3. Consequences of the changes on human communities, economies and well-being	295
4. Key region-specific changes and consequences	296
5. Outlook	296
6. Key remaining knowledge gaps	297
7. Key remaining capacity-building gaps	298
References	299
Chapter 7D: Tropical and subtropical coral reefs	305
Keynote points	307
1. Introduction	307
2. Description of environmental changes between 2010 and 2020	308
3. Description of economic and social consequences and/or other economic or social changes	309
4. Key region-specific changes and consequences	310
5. Outlook	312
6. Key remaining knowledge gaps	313
7. Key remaining capacity-building gaps	313
References	314

	<i>Page</i>
Chapter 7E: Cold water corals	321
Keynote points	323
1. Introduction and summary of the first <i>World Ocean Assessment</i>	323
2. Description of environmental changes between 2010 and 2020	324
3. Economic and social consequences	329
4. Key region-specific changes and consequences	330
5. Outlook	330
6. Key remaining knowledge gaps	331
7. Key remaining capacity-building gaps	332
References	333
Chapter 7F: Estuaries and deltas	339
Keynote points	341
1. Introduction	341
2. Documented changes in the state of estuaries and deltas	342
3. Consequences of the changes for human communities, economies and well-being	344
4. Key region-specific changes and consequences	345
5. Outlook	346
6. Key remaining knowledge and capacity-building gaps	347
References	348
Chapter 7G: Seagrass meadows	353
Keynote points	355
1. Introduction	355
2. Socioeconomic consequences	356
3. Region-specific changes	357
4. Outlook	358
5. Key remaining knowledge gaps	358
6. Key remaining capacity-building gaps	359
References	362
Chapter 7H: Mangroves	365
Keynote points	367
1. Introduction	367
2. Documented change in state of mangroves between 2010 and 2020	368
3. Consequences of the changes for human communities, economies and well-being	370
4. Key region-specific changes and consequences	372
5. Outlook	373
6. Key remaining knowledge and capacity-building gaps	373
References	374

	<i>Page</i>
Chapter 7I: Salt marshes	381
Keynote points	383
1. Introduction.....	383
2. Description of the environmental changes between 2010 and 2020.....	385
3. Consequences of the changes for human communities, economies and well-being.....	386
4. Key region-specific changes and consequences.....	386
5. Outlook	387
6. Key remaining knowledge gaps	388
7. Key remaining capacity-building gaps.....	389
References.....	389
Chapter 7J: Continental slopes and submarine canyons.....	395
Keynote points	397
1. Introduction.....	397
2. Developments in understanding of slopes and canyons	399
3. Ecosystem services and benefits on slopes and in canyons	404
4. Human impacts	405
5. Key remaining knowledge gaps	406
6. Key remaining capacity-building gaps.....	407
References	408
Chapter 7K: High-latitude ice.....	421
Keynote points	423
1. Introduction.....	423
2. Description of the environmental changes between 2010 and 2020.....	424
3. Economic and social consequences.....	428
4. Outlook	430
5. Key remaining knowledge and capacity-building gaps	431
References.....	431
Chapter 7L: Seamounts and pinnacles.....	437
Keynote points	439
1. Introduction.....	439
2. Description of changes in knowledge between 2010 and 2020.....	440
3. Description of economic and social changes.....	441
4. Key region-specific research in recent years	442
5. Outlook	444
6. Key remaining knowledge gaps	444
7. Key remaining capacity-building gaps.....	445
References.....	446

	<i>Page</i>
Chapter 7M: Abyssal plains	453
Keynote points	455
1. Introduction	455
2. Shifting baselines and documenting status and change in abyssal biodiversity	456
3. Major natural and anthropogenic pressures.	464
4. Consequences of the changes on human communities, economies and well-being.	465
5. Outlook	468
6. Key remaining knowledge gaps	468
References.	469
Chapter 7N: Open ocean.	477
Keynote points	479
1. Introduction.	479
2. Environmental changes in the open ocean since 2010	481
3. Consequences of the changes for human communities, economies and well-being.	484
4. Key region-specific changes and consequences.	486
5. Outlook	487
6. Key remaining knowledge gaps	488
7. Key remaining capacity-building gaps.	488
References.	488
Chapter 7O: Ridges, plateaux and trenches	495
Keynote points	497
1. Introduction and summary of the first <i>World Ocean Assessment</i>	497
2. Description of the environmental changes between 2010 and 2020	499
3. Description of economic and social changes between 2010 and 2020	502
4. Key region-specific changes and consequences.	505
5. Outlook	506
6. Key remaining knowledge gaps	507
7. Key remaining capacity-building gaps.	507
References	508
Chapter 7P: Hydrothermal vents and cold seeps	513
Keynote points	515
1. Introduction.	515
2. Environmental changes since the first <i>World Ocean Assessment</i>	518
3. Economic and social consequences	519
4. Key region-specific changes and consequences.	521

	<i>Page</i>
5. Outlook	523
6. Key remaining knowledge gaps	523
7. Key remaining capacity-building gaps	524
References.....	524
Chapter 7Q: Sargasso Sea	531
Keynote points	533
1. Introduction.....	533
2. Change of state	534
3. Institutional arrangements	537
4. Consequences of changes	538
5. Outlook	539
References.....	540

Volume II

Chapter 8: Trends in the state of human society in relation to the ocean.....	1
Chapter 8A: Coastal communities and maritime industries	3
Keynote points	5
1. Introduction.....	5
2. Coastal communities.....	6
3. Capture fisheries, shellfish harvesting and aquaculture	9
4. Shipping.....	10
5. Seabed mining	14
6. Offshore hydrocarbons	15
7. Tourism and recreation	15
8. Marine genetic resources	20
9. Marine renewable energy	21
10. Desalinization	21
11. Salt production	22
12. Key knowledge and capacity-building gaps	23
13. Outlook	24
References.....	24
Chapter 8B: Human health as affected by the ocean	31
Keynote points	33
1. Introduction.....	33
2. General aspects of the relationship between human health and the ocean	33
3. Health of coastal communities relative to inland communities.....	39
4. Effects of exposure to contaminated seawater	39

	<i>Page</i>
5. Problems for human health posed by food from the sea	42
6. Key remaining knowledge and capacity-building gaps	44
7. Outlook	45
References.	45
Part five: Trends in pressures on the marine environment	53
Chapter 9: Pressures from changes in climate and atmosphere	55
Keynote points	57
1. Introduction.	57
2. Climate pressures: extreme climate events and pressures from changes in ocean physical and chemical properties.	58
3. Capacity-building: Global Ocean Acidification Observing Network and Global Ocean Oxygen Network	67
4. Summary.	68
References.	69
Chapter 10: Changes in nutrient inputs to the marine environment.	77
Keynote points	79
1. Introduction.	79
2. Situation reported in the first <i>World Ocean Assessment</i>	81
3. Global-scale patterns and trends	82
4. Patterns and trends within regions	85
5. Outlook	91
References.	92
Chapter 11: Changes in liquid and atmospheric inputs to the marine environment from land (including through groundwater), ships and offshore installations.	101
Keynote points	103
1. Introduction.	104
2. Situation recorded in the first <i>World Ocean Assessment</i>	104
3. Persistent organic pollutants, including run-off from the use of agricultural pesticides	105
4. Metals	112
5. Radioactive substances	122
6. Pharmaceuticals and personal care products	127
7. Atmospheric pollutants (nitrogen oxides, sulfur oxides)	131
8. Hydrocarbons from terrestrial sources, ships and offshore installations, including arrangements for response to spills and discharges	132
9. Other substances used on, and discharged from, offshore installations . .	134
10. Relationship to the Sustainable Development Goals	135
11. Key remaining knowledge gaps	136

	<i>Page</i>
12. Key remaining capacity-building gaps	138
References	139
Chapter 12: Changes in inputs and distribution of solid waste, other than dredged material, in the marine environment	151
Keynote points	153
1. Activities resulting in marine debris, including plastics, abandoned fishing gear, microparticles and nanoparticles, and estimates of sources from land, ships and offshore installations	153
2. Dumping at sea, including garbage from ships and sewage sludge	171
References	177
Chapter 13: Changes in erosion and sedimentation	185
Keynote points	187
1. Introduction	187
2. Changes in state of coastal erosion and sedimentation	188
3. Consequences of the changes for human communities, economies and well-being	192
4. Key region-specific changes and consequences	193
5. Outlook	195
6. Key remaining knowledge and capacity-building gaps	195
References	196
Chapter 14: Changes in coastal and marine infrastructure	201
Keynote points	203
1. Introduction	203
2. Documented changes in the state of marine and coastal infrastructures	204
3. Consequences of changes for human communities, economies and well-being	207
4. Key region-specific changes and consequences	207
5. Outlook	210
6. Key remaining knowledge and capacity-building gaps	211
References	211
Chapter 15: Changes in capture fisheries and harvesting of wild marine invertebrates	215
Keynote points	217
1. Introduction	217
2. Catch-landing disparities, Sustainable Development Goals and small-scale fisheries	220
3. Invertebrate landings	224
4. Levels of by-catch and side effects	225
5. Post-harvest fish losses	225

	<i>Page</i>
6. Potential for fisheries enhancement	225
7. Marine protein and oils in agriculture and aquaculture	225
8. Illegal, unreported or unregulated fishing	226
9. Outlook	227
10. Key knowledge gaps	228
11. Key capacity-building gaps	228
References.	228
Chapter 16: Changes in aquaculture.	235
Keynote points	237
1. Current status and major improvements	237
2. Aquaculture and the environment	240
3. Aquaculture and society	241
4. Key remaining knowledge gaps	241
5. Key remaining capacity-building gaps.	242
6. Outlook	243
References.	244
Chapter 17: Changes in seaweed harvesting and use	247
Keynote points	249
1. Introduction.	249
2. Documented changes in the state of seaweed production and uses (2012–2017)	250
3. Consequences of changes in seaweed harvesting and use for communities, economies and well-being	253
4. Key region-specific changes and consequences.	253
5. Outlook	254
6. Key remaining knowledge and capacity-building gaps	254
References.	255
Chapter 18: Changes in seabed mining	257
Keynote points	259
1. Introduction.	259
2. Changes in scale and significance of sea floor mining	262
3. Environmental aspects	270
4. Economic and social impacts.	273
5. Capacity-building needs	276
References.	277
Chapter 19: Changes in hydrocarbon exploration and extraction	281
Keynote points	283
1. Introduction	283

	<i>Page</i>
2. Offshore hydrocarbon exploration, production and decommissioning . . .	285
3. Economic, social, and environmental aspects of offshore hydrocarbon exploration, production and decommissioning	288
4. Key knowledge and capacity-building gaps	290
5. Role of the offshore hydrocarbon industry in facilitating the marine renewable energy industry	291
6. Conclusion	292
References	293
Chapter 20: Trends in inputs of anthropogenic noise into the marine environment	297
Keynote points	299
1. Introduction.	299
2. Description of the environmental status	300
3. Description of economic and social consequences and other economic or social changes	308
4. Key region-specific changes and consequences.	308
5. Outlook	310
6. Key remaining knowledge gaps	312
7. Key remaining capacity-building gaps.	313
References	313
Chapter 21: Developments in renewable energy sources	321
Keynote points	323
1. Introduction.	323
2. State of marine renewable energy at the global level	324
3. Potential environmental impacts of marine renewable energy development	329
4. Socioeconomic benefits and impacts from marine renewable energy deployment	332
5. Key remaining knowledge and capacity-building gaps	333
6. Anticipated future trends.	335
References.	336
Chapter 22: Invasive species	343
Keynote points	345
1. Introduction	345
2. Documented baseline and changes in non-indigenous species	347
3. Consequences for human communities, economies and well-being	348
4. Key region-specific baselines, changes and consequences.	350
5. Outlook	354
6. Other	356
References.	356

	<i>Page</i>
Chapter 23: Developments in the exploration for and use of marine genetic resources .	363
Keynote points	365
1. Introduction.	365
2. Trends between 2010 and 2020	366
3. Economic and social consequences and changes	370
4. Key region-specific developments in knowledge and their consequences	371
5. Capacity-building gaps	371
6. Methodological challenges and future trends	373
7. Marine genetic resources and the Sustainable Development Goals	374
References.	376
Chapter 24: Marine hydrates – a potentially emerging issue	381
Keynote points	383
1. Introduction.	383
2. What are marine hydrates?	383
3. Potential risks from marine methane hydrates	386
4. Marine hydrates as a source of energy	388
5. Key knowledge and capacity-building gaps	390
6. Outlook	390
References.	390
Chapter 25: Cumulative effects	395
Keynote points	397
1. Introduction.	397
2. Cumulative effects assessments.	398
3. Regional applications of cumulative effects assessments on the marine environment: distribution and approaches	402
4. Outlook	406
References.	413
Part six: Trends in management approaches to the marine environment	421
Chapter 26: Developments in marine spatial planning.	423
Keynote points	425
1. Introduction.	425
2. Types of marine spatial planning	426
3. Marine spatial planning: a step-by-step approach toward ecosystem-based management.	427
4. Tools for marine spatial planning.	428
5. Progress in implementing marine spatial planning	430
References.	436

	<i>Page</i>
Chapter 27: Developments in management approaches	441
Keynote points	443
1. Introduction	443
2. Management approaches	444
3. Advances in ocean management approaches	448
4. Management tools to support mitigation of and adaptation to climate change, including building resilience	458
5. Key region-specific issues	460
6. Capacity-building	461
7. Gaps and future perspectives	462
8. Outlook	463
References	465
Chapter 28: Developments in the understanding of overall benefits from the ocean to humans	471
Keynote points	473
1. Introduction	473
2. Benefits and their distribution	477
3. Disbenefits to humans	478
4. Threats to ocean ecosystem services	479
5. Safeguarding ocean benefits through regional and international cooperation and improved implementation of international law as reflected in the United Nations Convention on the Law of the Sea	480
References	483
Annexes	487
Annex I: Original members of the writing teams approved by the Bureau	489
Annex II: Peer reviewers nominated for each chapter	497

Chapter 2

Approach to the assessment

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Keynote points

- The purpose of the second *World Ocean Assessment* is to update the first *World Ocean Assessment* by providing an understanding of changes that have occurred in the global ocean since 2010 and associated trends.
- The Assessment also provides an overview of understanding of some aspects not fully covered in the first Assessment, such as inputs of anthropogenic noise, marine hydrates, cumulative effects, marine spatial planning and management approaches.
- The Assessment follows a modified approach to the drivers-pressures-state-impact-response framework, supported through a series of workshops aimed at identifying region-specific information and input for the Assessment, a peer-review process and a process of review by States.

1. Purpose of the second *World Ocean Assessment*

The purpose of the second *World Ocean Assessment* is derived from the principles guiding the Regular Process for Global Reporting and Assessment of the State of the Marine Environment, including Socioeconomic Aspects, and its objective and scope as set out in relevant decisions of the General Assembly, the Ad Hoc Working Group of the Whole of the General Assembly on the Regular Process and its Bureau. The overall objective is set out in the recommendations of the Working Group on the proposed framework of the Regular Process (A/64/347, annex):

The regular process under the United Nations would be recognized as the global mechanism for reviewing the state of the marine environment, including socioeconomic aspects, on a continual and systematic basis by providing regular assessments at the global and supraregional levels and an integrated view of environmental, economic and social aspects. Such assessments would support informed decision-making and thus contribute to managing in a sustainable manner human activities that affect the oceans and seas, in accordance with international law, including the United Nations Convention on the Law of the Sea and other applicable international instruments and initiatives.

The recommendations of the Working Group were endorsed by the General Assembly in its resolution 64/71, and the principles guiding the Regular Process and its objective and scope were reaffirmed by the Assembly in its resolution 71/257.

With regard to the principles guiding the Regular Process, the Working Group states in its recommendations that:

The regular process would be guided by international law, including the United Nations Convention on the Law of the Sea and other applicable international instruments and initiatives, and would include reference to the following principles:

- (a) Viewing the oceans as part of the whole Earth system;
- (b) Regular evaluation by Member States of assessment products and the regular process itself to support adaptive management;
- (c) Use of sound science and the promotion of scientific excellence;
- (d) Regular analysis to ensure that emerging issues, significant changes and gaps in knowledge are detected at an early stage;

- (e) Continual improvement in scientific and assessment capacity, including the promotion and development of capacity-building activities and transfer of technology;
- (f) Effective links with policymakers and other users;
- (g) Inclusiveness with respect to communication and engagement with all stakeholders through appropriate means for their participation, including appropriate representation and regional balance at all levels;
- (h) Recognition and utilization of traditional and indigenous knowledge and principles;
- (i) Transparency and accountability for the regular process and its products;
- (j) Exchange of information at all levels;
- (k) Effective links with, and building on, existing assessment processes, in particular at the regional and national levels;

- (l) Adherence to equitable geographical representation in all activities of the regular process.

During the first cycle, the scope of the Regular Process and of the first *World Ocean Assessment* was to establish a baseline assessment of all aspects of the ocean – environmental, social and economic. In its resolution 72/73, the General Assembly decided that the scope of the second cycle would extend to evaluating trends and identifying gaps.

The present Assessment, which is the first follow-up to the first Assessment, is aimed at providing a global overview of trends since 2010 in all aspects of the ocean. In addition, it contains reports on some aspects of the ocean that were not fully covered in the first Assessment, including inputs of anthropogenic noise, marine hydrates, cumulative effects, marine spatial planning and management approaches.

2. Primary audience and framework of the second *World Ocean Assessment*

The Regular Process is primarily accountable to the General Assembly (see A/65/358). Given the objective of the Regular Process to “support informed decision-making and thus contribute to managing in a sustainable manner human activities that affect the ocean and seas”, the main intended audience of the present Assessment are people in all sectors who will be making decisions that will affect the marine environment. They need to be able to gain an overview of the entire marine environment, as well as focus on the aspects most relevant to their field.

The present Assessment follows the drivers-pressures-state-impacts-response

framework, as discussed in chapter 3 of the first Assessment, with some modifications. That modified approach resulted from the discussions in the first round of regional workshops (described below) on the structure of the Assessment. Consequently, in the present Assessment:

- (a) Relevant drivers of change in the ocean are set out (Part 3);
- (b) Trends in the current state of the main components of the marine environment, such as groups of species, types of habitats and human society, including maritime industries, are described (Part 4);

- (c) Pressures and their impacts on the ocean, including relevant socioeconomic components, are identified (Part 5);
- (d) Developments in the management measures adopted in response to those pressures and impacts are described (Part 6).

In the rest of the present Part, an overview is given of current scientific understanding of the ocean, in order to provide the background to the Assessment.

3. Preparation of the second *World Ocean Assessment*

In accordance with the terms of reference and working methods of the Group of Experts of the Regular Process for Global Reporting and Assessment of the State of the Marine Environment, including Socioeconomic Aspects, for the second cycle of the Regular Process, and the guidance for contributors prepared by the Group of Experts, the present Assessment was prepared by the Group and by writing teams drawn from the pool of experts.

The Group of Experts was constituted to oversee the work required to undertake the present Assessment. The Group comprises experts nominated by each of the United Nations regional groups of Member States. Those who wrote the individual chapters of the Assessment and reviewed drafts of those chapters were drawn from both the Group of Experts and a pool of experts. The pool comprises experts who served in the pool of experts during the first cycle of the Regular Process and additional experts nominated by States specifically for the second cycle.

The process of preparing the present Assessment began with the Group of Experts setting out the structure. An initial structure, based on that of the first Assessment, consisted of a summary followed by four parts focused on components of the ocean: the ocean and its circulation; the food web; coastal and shelf seas; and the open ocean. The proposed structure was discussed in an initial round of five regional workshops held in 2017, at which the outcomes of the first Assessment were outlined, recent regional assessments were

reviewed and regional priorities were identified for incorporation into the present Assessment. On the basis of inputs from those attending the workshops, the proposed structure of the Assessment was revised by the Group so that it addressed two main issues raised: that it more explicitly follow the internationally recognized drivers-pressures-state-impacts-response framework (Smeets and Weterings, 1999), and that it include specific coverage of management issues. The revised structure was embodied in the outline for the present Assessment, which was considered, amended and approved by the Ad Hoc Working Group of the Whole at its 10th meeting.

In support of the development of the chapters, a second round of regional workshops was held in 2018, attended by members of the Group of Experts and experts (including members of the pool of experts and proposed members of writing teams) nominated by States, especially those in the regions concerned. The workshops were focused on developing specific chapters of the Assessment, with participants highlighting regional inputs, regional capacity-building needs and other issues.

The Group of Experts ensured that there were appropriate lists of members of the writing teams, and submitted them to the Bureau of the Ad Hoc Working Group of the Whole for approval. A range of methods was adopted to identify possible members of the writing teams: several experts with relevant expertise were already in the pool of experts and agreed to participate in the drafting when approached

by the Group; some members took part in a regional workshop and were later nominated to the pool of experts; and some were added following a request for specific expertise by the Group or through self-nomination. The writing teams primarily conducted their work through teleconferences and correspondence.

The guidance for contributors was developed by the Group of Experts, which noted, *inter alia*, the need to strive for a global overview, how to describe risks, how to handle uncertainty, and ethics in authoring and evaluating material for the Regular Process (UNGA, 2017b; UNGA, 2018). Lead and co-lead members of the Group for each chapter provided guidance on acceptable types of information and balance within the chapter. Members of the writing team for each chapter were expected to consider the overall balance of the draft chapter and ensure that, as far as possible, each chapter was based on the best available data and information and that the conclusions made were sound and well supported.

4. Terminology

There is an important distinction to be made between the terminology used in the scientific description of the ocean and the legal terminology used to describe States' rights and obligations in the ocean. With the exception of some aspects of the continental shelf beyond 200 nautical miles, the limits of the maritime zones established by the United Nations Convention on the Law of the Sea are not based on geomorphic criteria.

In the present Assessment, unless stated otherwise, the term "continental shelf" refers to the geomorphic continental shelf, and not to the continental shelf as defined in the Convention (see in particular chapters 7J, 7M and 7N). The geomorphic continental shelf is usually defined in terms of the submarine extension of a continent or island as far as the point at which there is a marked discontinuity in the

The draft of each chapter, once completed and considered fit for peer review, was sent for review by at least two peer reviewers drawn from the pool of experts. Peer reviewers acted in a totally independent capacity and were not involved in drafting the chapter that they reviewed. They were requested to evaluate each chapter from the point of view of overall balance and to consider whether the best available data and information had been used and whether the conclusions were sound and well supported.

Following the peer review and the subsequent revision of each chapter by the writing teams, the chapters were compiled and edited to produce an integrated document to be submitted for review by States. Following that review, the chapters were further revised by the writing teams, and a final draft assessment was compiled. That was submitted by the Group of Experts to the Ad Hoc Working Group of the Whole in order for the Working Group to authorize submission to the General Assembly.

slope, and the continental slope begins its fall down to the continental rise or the abyssal plain (Hobbs, 2003).

Similarly, the term "open ocean" refers to the water column of deep-water areas that are beyond (i.e., seawards of) the geomorphic continental shelf. It covers the whole of the water column (pelagic zone) in the areas beyond the geomorphic continental shelf.

The term "deep sea" refers to the sea floor of deep-water areas that are beyond (i.e., seawards of) the geomorphic continental shelf. It is the benthic zone that lies in deep water (generally, water with a depth greater than 200 m).

Furthermore, the term "areas beyond national jurisdiction" refers to the high seas and the Area (i.e., the seabed and ocean floor and subsoil thereof, beyond the limits of national jurisdiction) as defined in the Convention.

5. Acknowledgements

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